PENNSYLVANIA
VEGETABLE GROWERS

NEWS

August 2014 / Volume 37 Number 8

for the commercial vegetable, potato and berry grower

2014 PVGA Grob Memorial Scholarship Awarded to Carville Mace

The Pennsylvania Vegetable Growers Association is pleased to present a $1,000 Rudolph Grob Memorial Scholarship to Carville Mace of Littlestown, a freshman at Penn State University.

The Association gives the annual scholarships in memory of Rudolph Grob of Millersville who served the Association for 50 years as a Director, 20 years as Secretary Treasurer and for over 20 years as manager of the Association's Farm Show Booth. Mr. Grob was a horticulture graduate of Penn State University who was employed for many years at Funks Farm Market in Millersville. The funds for the scholarship are generated by a portion of the interest earned by the Association's Keystone Fund, an endowment-type fund created by the voluntary extra dues paid the Keystone Members of the Association.

The purpose of the scholarship is to assist children and grandchildren of Association members in obtaining a degree that will enable them to pursue a career in the vegetable, potato or berry production industries. Applicants must meet the following criteria:

be the child or grandchild of an Association member who has been a member in good standing for at least one year

be enrolled in a two-year or four-year degree program;

be in good academic standing; and

be intent on pursuing a career in the vegetable, potato, or berry production industries.

Normally, one scholarship is awarded each year although for 2011, 2012 and 2013 two scholarships were awarded because there had been a backlog of three scholarships that were not previously awarded.

Carville is the son of PVGA members Carville and Mary Anne Mace of Foxleigh Farms in Littlestown. He is very much involved with almost every aspect of the farm operation from selecting varieties, managing the melon production, applying pesticides, controlling wildlife, selling the produce and operating the irrigation systems. (In his application he related how one of his first involvements in irrigation when he was very young was to uncouple all the irrigation hoses his father had just set up to water the sweet corn. His father, of course, discovered it when he started the pump. Perhaps that is one reason he is charge of the irrigation now!)

Carville is seeking an Agricultural Science degree at Penn State. He hopes to return to the family's 20-acre vegetable farm and help expand it from a strictly retail market operation to a 100-acre retail and wholesale market operation specializing in watermelon production.

Carville Mace recipient of 2014 PVGA Scholarship

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Ag Progress Days Booth Is Successful

PVGA and the Pennsylvania Sheep and Wool Growers Association (PSWGA) teamed up for the sixth year to operate a full-menu food booth at Penn State's Ag Progress Days. While PVGA sales were down about 10% from last year's record sales – primarily due to rain on the opening – sales were still good compared to other recent years. Preliminary figures show a gross profit of about $4,000.

Over half of the Association sales are its popular vegetable stir-fry – offered with and without lamb meat. The stir-fry is prepared with nearly all fresh Pennsylvania vegetables – broccoli, onions, peppers, cabbage, tomatoes, zucchini, yellow squash, and tomatoes plus carrots, garlic and sugar snap peas or green beans from elsewhere. Melon cups of diced watermelon and cantaloupe are also popular. Strawberry Surprises, the Association's popular slush drink, and raspberry lemonade, along with corn-on-the-cob, carrot whoopee pies, pumpkin whoopee pies and blueberry pie round out the menu. The PSWGA offered delicious American lamb gyros, lamb sandwiches, lamb pita salads and bottled water.

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Ag Progress Days... *(continued from page 1)*

Like the profits from the Association's booth at the Farm Show, the profits from the Ag Progress Days booth enable PVGA to contribute funds for vegetable and small fruit research and promotion. And volunteer help from PVGA members and friends is the only reason these kinds of profits are possible. The Association was especially blessed with help from five interns at the Southeast Research and Extension Center (Landisville farm) and 18 staff and students from the Bidwell Training Center in Pittsburgh. The PSU Horticulture Farm supplied tomatoes, peppers, onions, zucchini and summer squash, while Brian Campbell Farms supplied broccoli. Cantaloupes, watermelons, corn and cabbage were secured through Harner's Farm.

2014 Ag Progress Days Honor Roll

Following is the list of individuals who volunteered their time to staff the Ag Progress Days Food Booth this year. We apologize for any names that might be omitted.

Asterisks (*) indicate the number of days persons helped (if more than one).

Robert Amsterdam and Susan Richards
Joseph Bogash
Steven Bogash
Dennis Brubaker
Lane Brubaker
Edna Cardenas
Kathy Demchak***
Jennie Diehl
Timothy Elkner
John Esslinger
Peter Ferretti***
Shelby Fleischer
Majid Foolad**
Nate Gattey
Don Geise
Selena Gerlach
Timothy Gleason
Beth Gugino
Chris Harner
Tony Hatfield-Nicholson
Lois Klinger
Jason Lilley
Richard Marini
Michael Masiuk**
Jeffrey*** and Kay Mizer
Barrie Moser
Michael Orzolek**
Eric Oesterling
Ana Ross
Robert Pollock
Ryan Pyle
Elsa Sánchez**
Haley Shaw
Bernadine Strickler
Maria Stoltzfus
Matthew Sullenberger**
Cheryl Troxell
Interns from the South East Research and Extension Center
Brodie Pomper
Kevin Smeltz
Rachel Grube
Taryn Hogeland
T.J. Cole
18 Staff and Students from the Bidwell Training Center in Pittsburgh

2014 PVGA Grob Memorial... *(continued from page 1)*

Carville is a graduate of Delone Catholic High School in McSherrystown where he participated in track and field and Quiz Bowl team. He served as the wood shop foreman for three years and received awards for outstanding achievement in cabinet making and service to the school technology department. He also is a four-year Honor Roll student and received the Omni Club award. He has volunteered at various church and school activities, a Baltimore soup kitchen and the PVGA Farm Show booth.

PVGA is pleased to present the 2014 Grob Memorial Scholarship to Carville. One committee member said he epitomizes the type of individual PVGA is seeking to support with this scholarship.

Applications are now being accepted for the 2015 scholarships and are available by contacting PVGA at 717-694-3596 or pvga@pvga.org. The deadline is March 31, 2015. Applications are reviewed by the Association's Scholarship Committee which determines who receives the scholarships. The current committee members are: Carolyn Beinlich, Keith Eckel, Curtis Kaelin, Michael Orzolek and Hilary Schramm, Jr.

The $1,000 scholarships are awarded for a one-year period. Recipients may apply for a renewal although preference will be given to other qualified students over previous recipients. It is not a need-based scholarship.

*The **Pennsylvania Vegetable Growers News** is the official monthly publication of the Pennsylvania Vegetable Growers Association, Inc., 815 Middle Road, Richfield, PA 17086-9205*
phone and fax - 717-694-3596, email - pvga@pvga.org website - www.pvga.org

Our Mission:
The Pennsylvania Vegetable Growers Association serves Pennsylvania's commercial vegetable, potato and berry growers through education, research, advocacy and promotion.

Our Vision:
The Pennsylvania Vegetable Growers Association will be the driving force in ensuring the furture viability of the commercial vegetable, potato and berry industries in Pennsylvania.

Inquiries about membership, this publication or advertising rates should be directed to William Troxell, Executive Secretary, at the above addresses.

NEWS

National News Briefs

United Fresh Executive Committee Meets in Pennsylvania

Chairman Ron Carkoski hosted the summer meeting of the United Fresh Produce Association Executive Committee in early August at the Four Seasons Family of Companies headquarters in Ephrata. The committee met to discuss ways to continue increasing value to member companies, including the new Rising Leaders Seminar at this year's Washington Conference, and new programs on tap for 2015.

Following the committee's meeting at Four Seasons headquarters, the group visited the Leola Produce Auction, featuring a variety of produce grown mostly by Amish and Mennonite farmers in Lancaster County. During the meeting, the group discussed ways to enhance food safety education and training in Good Agricultural Practices for small producers with PVGA Director Jeff Stoltzfus and PVGA Executive Secretary William Troxell.

*From **Inside United Fresh,** United Fresh Produce Association, August 14, 2014.*

United's Executive Committee poses for a photo during meetings at The Four Seasons Family of Companies.

The United Executive Committee visited the Leola Produce Auction during meetings in Pennsylvania.

*From **Inside United Fresh,** United Fresh Produce Association, August 14, 2014.*

United Fresh Participates in White House Discussion on Immigration Options

The United Fresh Produce Association participated in a meeting with top-level White House staff about potential action from the president on immigration reform. The meeting was held in the Executive Mansion last week and was also attended by other agriculture sectors with a crucial stake in immigration policy.

Agriculture representatives were briefed members of the White House Office of Domestic Policy on the current status of the Obama Administration's deliberations about what actions are within the president's legal authority. President Obama is expected to receive recommendations by the end of the summer from the Department of Justice and the Department of Homeland Security on the parameters of what he can legally do, with specific policy initiatives from the president expected soon after that.

"The President's staff sought our input about what are some of the biggest problems that our sectors are facing. We emphasized that we are facing chronic labor shortages because of the extreme difficulty in finding skilled workers or in retaining workers, sometimes due to excessive law enforcement," said Julie Manes, United Fresh's director of government relations, who attended the meeting. "We were very clear that it is critical that the president be aware that there are unique considerations that agriculture has to deal with and so blanket initiatives may not be as helpful to agriculture as might be intended. It is essential that any initiatives that are relevant to agriculture are written with that in mind."

United Fresh continues to work with industry colleagues and with the White House on developing initiatives to provide relief for the produce industry. Furthermore, United Fresh also is continuing to push congressional leaders for action on immigration reform to provide the long-term, fundamental changes to immigration and ag labor policies that are critical to the industry.

*From **Inside United Fresh,** United Fresh Produce Association, August 7, 2014.*

Pennsylvania Farm Bureau Submits Comments to EPA on "Waters of the U.S." Rule

Pennsylvania Farm Bureau submitted comments to the Environmental Protection Agency over its attempts to expand its authority under the Clean Water Act, saying the agency is trying to narrow current farm exemptions allowed under the act.

While the EPA and U.S. Army Corps of Engineers are publicly saying the agencies are not narrowing the scope of "normal farming activities" allowed under the Clean Water Act, official documents suggest otherwise. That's just one reason that Farm Bureau is calling on the agencies to withdraw the rule immediately.

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National News Briefs (continued from page 3)

"The effect of the interpretative rule's assertion is to seriously limit the scope of traditional and commonly recognized farming practices that are to be given exemption under the Clean Water Act," PFB said in comments.

PFB is concerned that some land activities, occurring on property adjacent to "Waters of the U.S." could lead to the need for permits and put farmers at risk for legal action from federal agencies or citizen lawsuits.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

House Passes Long-Sought Pesticide Measure

The U.S. House of Representatives passed H.R. 935, the Reducing Regulatory Burdens Act, by a vote of 267-161. The bipartisan legislation amends both the Federal Insecticide Fungicide and Rodenticide Act and the Clean Water Act. The measure would correct the duplicative requirements associated with EPA's regulations by specifying that federal Clean Water Act permits are not needed for the lawful land-application of pesticides for agricultural use. All of Pennsylvania's Republican House Members voted for H.R. 935.

*From **Farm Bureau Express,** Penna. Farm Bureau, August 4, 2014.*

House Committee Takes Action to Thwart Clean Water Act Expansion

Members of the House Transportation & Infrastructure Committee approved a bill that seeks to curtail the Environmental Protection Agency and U.S. Army Corps of Engineers.

The committee, chaired by Rep. Bill Shuster, (R, Pa.) approved H.R. 5078, which would uphold the current federal-state partnership for waterways covered by the Clean Water Act. If passed, the bill would prevent both the EPA and Army Corps from implementing or enforcing their proposed expansion of authority under the Clean Water Act.

"This bill ensures that we can continue to protect our water without unreasonable and burdensome regulations on our businesses, farmers and families," Shuster said.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

United Fresh Submits Comments to FDA Regarding Consumer Messaging Amendments to the Reportable Food Registry

The United Fresh Produce Association has submitted comments to FDA on the advance notice of proposed rulemaking regarding Food Safety Modernization Act (FSMA)-mandated requirements for consumer-targeted messaging related to the Reportable Food Registry. In its comments, United addresses several questions raised by FDA, and advises FDA that additional messaging requirements could cause confusion among companies submitting such messaging, as well as retailers required to display such messaging. Further, the messaging could be confusing to consumers, and incur unnecessary costs for all involved.

"If a company agrees to a voluntary or mandatory recall that FDA classifies as Class I of a food that was sold or otherwise provided to consumers at retail points-of-sale, the company should be required to provide consumer-oriented information under the same conditions that they are currently required to provide a press release; i.e., when such notification provides consumers with information reasonably useful to determine whether they are in possession of adulterated food," said United Fresh in its comments to FDA.

*From **Inside United Fresh,** United Fresh Produce Association, August 14, 2014.*

Congress Agrees on Highway Trust Fund

The House and Senate reached an agreement that will continue to provide money for the federal Highway Trust Fund through May 2015. The move came within days of Congress leaving Washington D.C. for their August recess. The Highway Trust Fund is used by the federal government to reimburse states for highway, bridge and transit projects. Congress's agreement will bring in $9.8 billion for the trust. Farm Bureau supports the maintenance and improvement of the nation's transportation infrastructure because of the vital role it plays in allowing agriculture to operate. A sound transportation network allows farmers to move goods and products from their farm to market, but also makes it easier and more cost effective to operate their equipment.

*From **Farm Bureau Express,** Penna. Farm Bureau, August 15, 2014.*

USDA Launches Pilot Project for the Procurement of Unprocessed Fruit and Vegetables

The Agricultural Marketing Service (AMS) and the Food and Nutrition Service (FNS) have launched a pilot project which will provide participating States the ability to utilize USDA Foods entitlement dollars in their competitive procurement of unprocessed fruit and vegetable products. This pilot project is required under Section 4202 of the Agricultural Marketing Act of 2014.

AMS will establish and maintain a list of eligible vendors from which participating States and schools may procure unprocessed fruit and vegetables (to include fresh cut products) under the pilot. To be included on the list, interested vendors must submit an application to AMS providing evidence that specific requirements have been met.

For more information on participating as an eligible vendor, please visit the AMS Commodity Purchasing website, www.ams.usda.gov/commoditypurchasing and click on the link for the "Pilot Project for the Procurement of Unprocessed Fruit and Vegetables."

AMS will post additional documents and guidance to these websites as they become available.

To receive email notification from AMS regarding pilot program developments, please subscribe to AMS CP News (http://info.ams.usda.gov/CPD/subscribe.html) and select the "Unprocessed FV Pilot Project" distribution list. The subscription form is also on the AMS website, www.ams.usda.gov/commoditypurchasing.

For further information, contact Nate Sudbeck at 202-720-3052 or at Nate.Sudbeck@ams.usda.gov.

NEWS

State News Briefs

Budget Signed, But Governor Calls for Action on Pension

Gov. Tom Corbett has signed a $29.1 billion budget, nine days after it was approved by the General Assembly, but he used his line-item veto power to cut funding to the legislative branch.

The move was in response to the General Assembly's failure to take any action on pensions, which threatens to eat up an increasing share of tax dollars in the coming years. The budget largely addresses the needs of agriculture, including adequate spending for the Pennsylvania Department of Agriculture's general operating budget. However, programs like Penn State Cooperative Extension and agriculture research received flat funding. Pennsylvania Farm Bureau had advocated for an increase in spending to make up for prior cuts in funding.

"We were seeking a six-percent increase in funding for research and extension and are now concerned that those programs may experience a reduction in overall services without any additional economic resources," said PFB President Carl T. Shaffer.

Gov. Corbett has called on lawmakers to return to session and address pension reform. PFB has also urged the legislature to address pension reform.

"All Pennsylvanians are negatively impacted by the pension debt, but farmers are especially vulnerable to increased property taxes due to the amount of land they own to operate their businesses," Shaffer said.

So far, lawmakers have not returned to work or indicated that they would return to Harrisburg before October.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

Huntingdon County Farmers Talk With Corbett About Pension

Farmers in Huntingdon County held a round table discussion with Gov. Tom Corbett to discuss their concerns over how pension costs are causing school taxes to increase.

The farmers, who are members of the Huntingdon County Farm Bureau Board of Directors, said schools were cutting back on services, due to rising pension costs, while taxes were decreasing their profits.

Bill Hoover, who hosted Gov. Corbett at his farm, said 12 percent of his income goes to paying property taxes. In order to be profitable, farmers need to own or rent a sizable piece of ground, and with that comes a high property tax burden, Hoover said.

"Farmers need to have a lot of land, or you are out of agriculture," he said.

In recent weeks, Gov. Corbett has been meeting with Pennsylvanians after the General Assembly failed to address the state's growing pension crisis. He's called on lawmakers to come back to Harrisburg and address the situation to give taxpayers relief. "The longer you delay, the worse the situation gets," he said.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

Farm Bureau Starts Summer Environmental Tours

PFB is continuing its successful program of using member farms to showcase environmental stewardship to regulators from the Pennsylvania Department of Environmental Protection and local conservation districts.

PFB hosts six farm tours across the state to demonstrate the latest techniques that farmers have adopted to reduce soil loss and protect the environment. During the tours, farmers also showcase the equipment they use—such as no-till planters—that help conserve resources.

Farm tours have also demonstrated integrated pest management programs, contour strips, waterway buffers and streambank fencing. The tours also help build relationships between regulators and area farmers. Tours are hosted by Farm Bureau's volunteer environmental coordinator program.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

REAP Funding Available

Pennsylvania farmers can use a state tax credit program to purchase equipment, or utilize best management practices that promotes conservation.

The Resource Enhancement and Protection (REAP) program provides tax credits for farmers who want to install best management practices or buy equipment that will help reduce erosion or sediments. REAP, administered by the State Conservation Commission, provides farmers an incentive to purchase equipment.

"Conservation-minded capital improvements and management changes can be a challenge for farm families to afford," said Agriculture Secretary George Greig. "But Pennsylvania's investments have provided our farmers with an additional boost to help protect the environment and especially the Chesapeake Bay. REAP is an incentive that will keep Pennsylvania productive for generations to come."

Farmers can submitting applications for completed projects Aug.4 and pending projects on Aug. 25. Projects are considered on a first-come, first-served basis. Private investors can sponsor projects by providing money for producers, in return for tax credits. Farmers can receive tax credits of up to $150,000 per operation for 50 or 75 percent of the total project costs.

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State News Briefs (continued from page 6)

Common projects approved include no-till planting equipment and waste storage facilities.

Applications for the 2014-2015 REAP program area available at www.pda.state.pa.us/REAP under "Forms," or by contacting Joel Semke at 717-705-4032 or jsemke@pa.gov.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

Young Farmers Glean Fields for Needy

Members of Pennsylvania Farm Bureau's Young Farmer & Rancher Committee spent a recent Saturday night gleaning a field to help the needy.

Committee members gathered 650 pounds of squash from a field donated by Mike and Melanie Fink. The produce gathered by the committee members was sent to a local food bank.

The squash picking was held as part of Farm Bureau's "Harvest For All" program. Young farmers across the country, work with local food banks and Feeding America to take extra food from their operations and ensure that it gets in the hands of families in need.

At the Fink's farm in Lehigh County, around 20 young farmers picked through the squash field, cutting off the fast-growing produce, while others on a tractor quickly boxed up the fresh-picked bounty.

Farmers are committed to helping others in their community, said David Bentrem, a YF&R committee member from Washington County.

"We care about the products that we are making and growing," he said.

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

Students Learn to Be Advocates for Agriculture at FACE Conference

High school students from across the state had the opportunity to learn how to be advocates for agriculture during Pennsylvania Farm Bureau's Fueling Agriculture and Cultivating Excellence (FACE) conference.

More than 50 high school students from across Pennsylvania spent a week at Bucknell University to learn more about Pennsylvania Farm Bureau and its mission.

During their time together, students were given lessons in PFB's policy development process and held a mock legislative session where they worked with others to move bills through legislative process. Students were also broken into commodity groups, where they made a Facebook page and developed a two-minute video to promote their particular area.

They also had the chance to brush up on interview and etiquette skills and learned how they can stay involved in agriculture.

Barrett Keene, a past National FFA officer and agriculture educator, motivated students to find their own leadership potential and to learn to put others first.

"In order to be a good leader," Keene said, "you have to shift the focus from yourself to the people around you."

It was a good message to hear said Cheyenne Maben, 17, from Juniata County.

"I learned not to think of myself. To realize that it's more important to emphasize the message rather than myself, and also to go outside my comfort zone."

*From **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, August 2014.*

NEWS

Penn State Program Helps Farmers Get Back to the Job

Ken Bowser's dream job is to work as a dairy farmer. For the past quarter century, he's been living his dream at his farm in Jefferson County. But an injury and illness has made the daily rigors of farming difficult.

Along with having a heart attack, Bower was also diagnosed with a disease that causes enlargement of blood vessels, which restricts blood flow. Getting up and down on a tractor, or moving his pasture-feed cows into the barn was growing increasingly difficult.

Bowser was able to use PA AgrAbility, a joint program between Penn State and the Pennsylvania Department of Labor and Industry, to receive equipment that will allow him to accomplish his daily farm tasks. Through the program, Bowser received a special ladder that makes climbing into the tractor easier, and also an all-terrain vehicle for moving cows into the barn.

"You can't imagine how much that has helped me," he said.

Farming is a labor-intensive endeavor. And for some farm jobs, like milking cows, the repetitive motion can cause certain joints to wear out over time, said Dr. Connie Baggett, director of the AgrAbility project. AgrAbility allows farmers to better manage their jobs so they can stay productive, regardless of an illness or accident, Baggett said.

"We need to help these folks because they are making a positive impact on society, and they want to keep working," he said.

AgrAbility, which started in 1994, works with the Pennsylvania Department of Labor and Industry to secure funding or low-interest loans for special equipment that will allow injured farmers to better perform their jobs. For instance, the program has helped farmers purchase new tractor seats or speed hitches that don't require farmers to have to get up and down on their tractors as frequently. AgrAbility recently worked with a farmer in Western Pennsylvania who was suffering from black lung—due to decades of working in the mining industry. AgrAbility was able to help the farmer get a climate controlled cab for his tractor, so that extreme heat or cold would not cause lung irritation, Baggett said.

Bowser also benefited from a special fundraiser hosted by Penn State's Agriculture fraternities. A benefit organized by the fraternities allowed Bowser to purchase a sprayer.

"It's great to have college students looking out for farmers," Baggett said.

Bowser's illness has made the day-to-day work of farming difficult, but the help that AgrAbility provided has made the work somewhat easier, and kept him at the job he loves.

"This is my idea of a dream job," he said. "When you don't want to give up, they are here to help you keep going."

To learn more about AgrAbility visit: http://extension.psu.edu/business/agrability

Are You Interested in Hosting a Mock Audit?

Are you interested in food safety certification for your farming operation? Penn State Cooperative Extension and Pennsylvania Department of Agriculture are partnering to provide mock audit workshops throughout our state. Mock Audits are a great introduction to food safety, and are also useful to those well acquainted with Good Agricultural Practices as well as other Food Safety Standards and who are looking forward to the next step.

Mock Audits are open to the public and include a brief introduction to food safety certification, a Q&A session with PDA auditors, and a walk-through of a farming operation with the auditors to further understand the in's and out's of GAPs certification.

By hosting, growers are able to get a look at their operations through the eyes of PDA auditors before an actual audit, as well as getting to ask their food safety questions of auditors first hand. These mock audits are educational and informal in nature. They are not designed to test your operation in any way, simply to educate and spread accurate information on food safety audits and inspections. You need not be certified for food safety or to have completed your food safety plan.

If so, please call or email Hannah Grose, Program Assistant for Food Safety at 717-334-6271 Ext 325 or hbg11@psu.edu.

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Grown in PA. It makes a difference.

NEWS

Scaling Up Workshop October 23: Increase Efficiency. Increase Product Quality and Safety. Add Farm to Institution Sales.

Can our local farms meet the growing demand for local food? In the Lehigh Valley, institutional sales to five hospitals and colleges surveyed alone could result in more than three million dollars of additional revenue for local farmers. Join us for a discussion of how farmers can meet the additional production, food safety and post-harvest handling demands of scaling up to add wholesale and institutional sales to their market mix.

Pre-cool with hydrocooling. Spiral Path. Photo credit Andy Andrews.

The Seed Farm, Lehigh County's New Farmer Training Program and Agricultural Business Incubator, invites you to this full day workshop October 23 in Emmaus to help you grow your farm business. Learn about the potential for sales to colleges and hospitals from Lynn Prior, Buy Fresh Buy Local. Delve into improving produce quality and safety with a discussion lead by farmers Mike Brownback, Spiral Path Farm; Andy Andrews, Pennypack Farm; Rebecca Munro, The Seed Farm; and Tianna DuPont, Penn State Extension. They will share practical measures from their farms. This discussion will highlight the application of Good Agricultural Practices requirements and post-harvest science. In order to scale up equipment, efficiency and labor management are critical. Tianna DuPont, Penn State Extension and local farmers will share key efficiencies from ten farms.

For more information and for event reservations visit theseedfarm.org or call (610) 391-9583 ext. 16. There is no fee to attend, but this event will fill so register to reserve your lunch! REGISTERED attendees will receive a Scaling Up Handbook. Research and support for this workshop was provided by a grant from the Reinvestment Fund.

*From the **Vegetable, Small Fruit and Mushroom Production News,** Penn State Extension, http://extension.psu.edu/plants/vegetable-fruit/news/2014, July 17, 2014.*

Young Grower Alliance to Visit Spiral Path Farm and North Mountain Pastures November 18

The Penn State Extension Young Grower Alliance is sponsoring a tour to Spiral Path Farm and North Mountain Pastures on Tuesday, November 18, from 9 am to 3 pm. Please sign up by November 14, and indicate whether you will meet at Spiral Path Farm at 8:45 am or if you plan to carpool from the Adams County Extension Office (van leaving at 7 am).

Spiral Path Farm is located in South-Central Pennsylvania, in scenic western Perry County, between the Tuscarora and Blue Mountain ranges. The address is 538 Spiral Path Lane in Loysville. Spiral Path Farm has been home to Mike and Terra Brownback and family since 1978. The farm has been certified organic since 1994, and all 255 acres are farmed naturally. North Mountain Pastures is owned and operated by Brooks Miller and Anna Santini. The Millers started managing farms together in 2006, and now own 84 acres outside of Newport, Pennsylvania, where they raise chickens, pigs, turkeys, cows and sheep, all with permanent access to pasture.

Bring a small covered dish to share. North Mountain Pastures and the Young Grower Alliance will be providing grilled meats. There is no fee to attend this event. However, pre-registration is requested. Registration deadline is November 14, 2014 4:00 PM

To register, visit http://extension.psu.edu/plants/tree-fruit/events/educational-tour-for-young-specialty-crop-and-livestock-producers.

AgBiz Masters

A Learning Series for Young & Beginning Farmers

Manage your business for the future.

Enroll in AgBiz Masters and acquire the skills to help you make smart decisions. The next class will be held November 2014–March 2015.

What is AgBiz Masters?

AgBiz Masters is an interactive, educational learning series designed specifically for young and beginning farmers interested in honing their business and financial management skills. The program takes a blended learning approach where participants complete on-demand, eLearning modules and activities, coupled with face-to-face regional seminars that are led by industry experts.

What does AgBiz Masters entail?

AgBiz Masters is a two-year series where you enroll in one year of the program at a time.

Year one topics:

- Megatrends of Agriculture
- Strategic Business Planning
- Preparing for Your Lender
- Constructing a Balance Sheet
- Constructing an Income Statement and Cash Flow Projection

Year two topics:

- Understanding Lending Decisions
- Farm Business Management Factors and Benchmarks
- Growth and Transition Management
- Personal Financial Management
- Communications, Ethics and Leadership

The interactive online modules take approximately one hour each to complete. In addition to the modules, you will participate in online discussion forums and exams, as well as complete assignments. A kick off meeting and two face-to-face workshops are held each year to supplement the online learning and allow discussions and feedback among participants and facilitators. Workshops are held in 13–15 locations across Pennsylvania, Maryland and other neighboring states, and speakers present through video-conference technology.

Regional farm tours are a new component of AgBiz Masters this year. Tours will be held across the AgBiz Masters area to expose participants to different facets of agriculture.

SmartStart
Stimulating Success With Young, Beginning & Small Farmers

Participation in AgBiz Masters earns you up to eight (8) SmartStart credits each year from AgChoice Farm Credit and may qualify you for a reduced interest rate on a new AgChoice loan! Learn more about SmartStart at www.agchoice.com/farms/smartstart.

"AgBiz Masters has helped us to understand that we aren't just milking cows and planting crops. We are here to run a business and manage it as a business."

~ Jeff & Jason Gerber, Addison, NY
AgBiz Masters graduates

"I credit AgBiz Masters for helping to give me confidence to build and expand my horse boarding business. The program has also encouraged us to have discussions with my family about how we can be the next generation on the family farm."

~ Blakslee Masters, Sugarloaf, PA
AgBiz Masters graduate

www.AgBizMasters.com

Why should you participate in AgBiz Masters?

AgBiz Masters is a new approach to meeting the unique needs of today's young and beginning farmers. Since all of the modules are available online, you can access the materials via the web at your convenience. Regional seminars offer additional learning opportunities from peers in the program as well as industry representatives. Participants who successfully complete both years of the course will receive a certificate of completion.

If you're looking for a hands-on educational program that tackles the questions and challenges you have about managing your agricultural business, AgBiz Masters is your answer. The time spent in the program and information learned will provide an invaluable return on your investment, securing a stronger future for your business.

When does AgBiz Masters begin?

The next class of AgBiz Masters will be held November 2014 through March 2015. The deadline to register is October 31, 2014. A kick off meeting will be held with all participants in November to provide an overview for the program and timeline for the five-module series and regional meetings.

How much does AgBiz Masters cost?

The registration fee for one year of AgBiz Masters is $225 and must be received prior to the October 31 deadline. This fee is an incredible value for a program valued at $375! AgBiz Masters is offered to you at this reduced rate because of grant funding and support from sponsors. Please note that your $225 fee covers one or two people per registration per year. You may be eligible for additional scholarship reimbursements to help cover the registration cost. For more information on what scholarships you may qualify for, please visit **www.AgBizMasters.com**.

Registration details:

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   Mechanicsburg, PA 17050
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NEWS

Introduction to Organic Veg Production Workshops Reminder

Manage your Soils for High Soil Quality

When: Saturday September 15, 3:30 PM - 6:30 PM
Where: Great Bend Farm, 417 Broad St. Port Clinton, PA 19549

High quality soil is the basis of health crop production. Learn from farmer Sara Runkel, Great Bend Farm and Tianna DuPont, Penn State Extension how to assess soil quality on your farm and strategies to improve it. This workshop Saturday, September 15, 2014 from 3:30 PM - 6:30 PM will cover soil texture, aggregate stability, soil biology, cover crops and compost. Don't miss this opportunity to delve into soil quality with hands on assessments. Hear what works on the farm.

No pre-registration is necessary. Location 417 Broad St. Port Clinton, PA 19549. Walk-in fee is $15 ($5 for apprentices). For more information visit extension.psu.edu/start-farming or call Tianna DuPont (610) 746-1970.

Plan your Crop Rotation

When: September 23, 2014 5:30 PM - 8:30 PM
Where: Lehigh County Agricultural Center, 4184 Dorney Park Rd, Allentown, PA 18104

Join Penn State Extension September 23rd in Allentown PA for a workshop on rotation planning. A good crop rotation is essential for managing soils, pests and diseases on the farm. Of course things change as the season progresses but part of good rotation planning is understanding how current field choices impact future crop options. Good crop and rotation planning save time during the peak season and allow you to still manage for your long term goals. Integrating cover crops into your rotation can be especially challenging. Laying out your rotations and your goals can facilitate more soil building cover crop acreage on the farm.

No pre-registration is necessary. Location 417 Broad St. Port Clinton, PA 19549. Walk-in fee is $15 ($5 for apprentices). For more information visit extension.psu.edu/start-farming or call Tianna DuPont (610) 746-1970.

Become Familiar with Heat Illness Symptoms

Although this summer has been relatively cool, it is extremely important that employers and workers become familiar with the signs, symptoms, and dangers of heat illness. By taking the proper precautions, serious injury or death can be easily prevented.

There are two types of heat illness; heat exhaustion and heat stroke. Heat exhaustion symptoms include dizziness, headache, sweaty skin, fast heartbeat, nausea, vomiting, weakness, and cramps. Symptoms of heat stroke include red, hot, or dry skin, high body temperature, confusion, fainting, and convulsions. Both types of heat illness are very serious, and can lead to death.

Employers should learn to spot the signs of heat illness, and provide frequent rest breaks for workers, especially in high heat conditions. Plenty of water should be made available to workers as well. If possible, shade should be provided to workers (awnings, canopies, etc.) if it is not typically available.

Workers should also learn the symptoms of heat illness. Proper warm weather attire should be worn during hot weather; light-colored, loose-fitting clothing and a hat to protect the head. Water should be consumed every 15 minutes, even if workers are not thirsty. Frequent breaks should be taken in the shade to allow the body to cool down and rest.

The U.S. Department of Labor has provided several informational documents, as well as signage that can be posted on work sites or farms. This information should be made available to employees in order to help prevent heat illness from occurring. Please visit the following websites for more information about heat illness.

Occupational Heat Exposure
https://www.osha.gov/SLTC/heatstress/
Prevent Heat Illness in Outdoor Workers
https://www.osha.gov/SLTC/heatillness/
OSHA Campaign to Prevent Heat Illness in Workers E-Newsletter
https://www.osha.gov/SLTC/heatillness/heat_enewsletter.html
To Prevent Heat Stoke Among Farmworkers
http://www.farmshow.state.pa.us/files/Heat%20Stroke%20Warning%20-%20English.pdf

Mr. Delvalle is with Penn State Extension in Schuylkill County.
From Penn State Extension,
http://extension.psu.edu/plants/ green-industry/news/2014/become-familiar-with-heat-illness-symptoms

GENERAL

PA Preferred: Oak Grove Farms Serving Customers for Five Decades

Oak Grove Farms has been a Mechanicsburg, Cumberland County, staple for more than half a century. In 1964, brothers Earl and Paul Lebo began delivering fresh eggs from their poultry farm door to door. Paul's sons Dwayne and Bryan purchased the farm in 1998 and shifted the farm's focus by expanding the operation to include homegrown produce.

"My dad and uncle were ready to slow down a bit and let the next generation take the reins," said Bryan.

Oak Grove built a retail store in the spring of 1999 to increase accessibility to their products in the community. The store today has grown to include a bakery and greenhouse, increasing convenience and accessibility for customers. Bryan and his sister, Linette, operate the bakery, while Dwayne manages the farming with Paul.

"We grow a variety of fruits and vegetables at Oak Grove, and are committed to having not only fresh, but quality homegrown produce," said Bryan. "The strawberries and sweet corn are easily our customer favorites."

In nearly 17 years the produce business has grown to supply more than 60 grocery stores.

"We have been able to build a great relationship with the local community over the years and, we are grateful for that," said Bryan. "We enjoy interacting with people and serving our local community."

GENERAL

Farm Food Safety Notes

Wes Kline and Meredith Melendez

An Emergency Plan for Your Portable Toilet

What would you do if your portable toilet had a spill? Operations that utilize portable toilets should have an emergency containment plan in place and all workers should be familiar with this plan.

The goal of this plan is to contain the spill to the immediate area around the portable toilet and to prevent contamination of production areas. In the case of a portable toilet spill, one acceptable plan would be to immediately call the portable toilet service company and to build an earthen dam around the spill area to prevent further movement of the spilled contents. Think about your portable toilet locations, how you would handle a spill situation and make sure that your workers are aware of the plan.

Hand Washing Stations

Hand washing stations are an important part of your farm food safety goals.

Stations must be located at all bathroom facilities, ideally outside of the bathroom and in public view. Research has shown that people are much more likely to wash their hands if someone is watching them. You might want to consider additional hand washing stations in sales areas, eating areas or near any animal exhibits at the farm. If you sell items at a community farmers market you can cheaply make a portable hand washing station for workers to use. The University of Minnesota has a DIY template for building a hand washing station that costs less than $20.00 (see accompanying pictures and materials list). Additionally something as simple as a 3 gallon water jug with a spigot, paper towels, soap and a 5 gallon bucket to catch the grey water would also work.

I Received Corrective Actions on My Audit, Now What?!

Corrective actions are a normal part of the third party audit process, and it can be expected that most growers will have at least one corrective action assigned to them. The question we have been hearing from growers repeatedly this season is, "Do I have to do anything about corrective actions if I pass the audit?" The answer is YES!

If the corrective actions are not corrected or addressed prior to the next years audit there is the potential for the audit to not be completed. Inspectors will arrive at the farm prepared to look at the previous year's corrective actions and if they are not satisfactorily addressed the audit will be stopped. Corrective actions do not need to be fixed right away but need to be addressed before the next audit.

One of the most common corrective actions that we are hearing about relates to not having all commodities grown at the farm audited. This presents and issue since some buyers only require one commodity audited or just the commodities sold to that buyer audited. The best way to handle this type of corrective action is to include in your food safety plan and in your documented corrective actions log that you are actively working towards adding additional commodities to the audit process. The auditors will want to see evidence of added commodities to the audit each year.

The authors are with Rutgers Cooperative Extension. From thehttp://plant-pest-advisory.rutgers.edu/author/kline-melendez/

Plant and Pest Advisory, *Rutgers Cooperative Extension, July 11 and 18 and August 22, 2014*

1. **Water container** -- the blue container holds 5 gallons of water and has an open/close valve. Available at big-box home hardware store in the camping section. $9.99
2. **Soap**.
3. **Trash can** with a lid so paper towels don't blow around in the wind. We used an old rag container found in the barn.
4. **Water catching bucket** (5 gallon bucket)
5. **Dishpan**. Another found item, is the "drawer" under the water container and holds single use paper towels. You can use whatever you want for this. Doesn't need to be a dishpan.
6. **Wood** (salvaged). 2x6's, 2x4's, and plywood for the top, sized to fit.
7. 60 2.5" **screws**.
8. **Bungee cord**

GENERAL

Growers Tour: New Morning Farm and Tuscarora Organic Growers Cooperative

Carla Snyder

Housed on neighboring plots of land, New Morning Farm and the Tuscarora Organic Growers Cooperative have a symbiotic history. Penn State Extension, through a sponsorship from the Pennsylvania Vegetable Growers Association, was fortunate enough to organize a tour of these two businesses one hot sticky evening in July.

A riveting storyteller, Jim Crawford, regaled visitors with details of how he and his wife, Moie, began the farm located in Hustontown, PA in 1976. He told of their humble beginnings and subsequently how the idea of a few farmers, "tired of selling 'cukes at a conventional price," formed a vibrant and growing organic agricultural marketing cooperative in the years that followed.

New Morning Farm is not a novice when it comes to retail sales. They are established at prominent farmers' markets throughout Washington D.C. Their most successful market on Saturdays at times requires up to 10 cashiers to serve the floods of people looking for fresh organic produce from their farm alone.

In their beginning they noticed they always had extra produce from their farmers' markets. They were producing above the level they were able to sell. In the 1970s this meant a quick stop at the back doors of a few select restaurants in D.C. on the way home from market to give chef's a chance to purchase direct from the farm. New Morning Farm sold to co-op grocery stores and they became some of their best customers. "It's not a new idea. It's a very old idea," Crawford said of selling his farm fresh produce directly to consumers and grocers.

Eventually New Morning Farm paired with two other growers and they alternated delivery weeks in the city, saving on fuel expense by combining trips. This worked well, but was just the beginning. They recruited more organic growers to take advantage of economies of scale in order to be profitable, or at least break even. Out of this effort, in 1988, Tuscarora Organic Growers was formed.

New Morning Farm continued its individual growth as well. The, "intention is retail production for retail marketing," Crawford said of New Morning's business philosophy. Today they have 30 acres of their total 95 in production at any one given time and are taking care of their land, keeping a portion in cover crop for future seasons. He's selective about crops that grow and sell well in their markets. Tomatoes are their biggest seller followed by corn and green beans. Total estimated production value for the farm in recent years is $799,000, "significant amounts of food for our customers to eat, but gross sales are not the only measure of success" Crawford states. They run their retail markets eleven months a year and sell to TOG year round.

New Morning Farm isn't just known for their retail sales, in growers' communities they're well-respected for their apprentice program. Doing much work with efficient, highly skilled employees, this farm runs like a well-oiled machine. We were able to

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GENERAL

Growers Tour... *(continued from page 15)*

meet with Pearl Wetherall, their seasoned field manager, to discuss some of their staffing positions, intricacies of their apprentice program and how all the work to grow on 95 acres is accomplished. This year Pearl told us they have 12 apprentices, many of which they house at the farm, and at least 7 farm workers throughout the season. At New Morning apprentices are given responsibilities for certain crops throughout the season. This keeps the farm organized and helps those new to farming learn the skills to manage each crop from seed to harvest.

In 2002, New Morning was Certified USDA Organic, a rigorous process for any grower. This, in addition to their passive solar greenhouses, was able to give them a competitive edge in producer-only markets in the city. It allows them to grow year round, sell in winter markets and keep contact with their customers throughout the year.

USDA Organic certification is a mandatory requirement for those entering the cooperative. In the formative years TOG was no more than, "a person, a cooler, a truck, a phone and an office. We knew it couldn't be fancy on a budget," Crawford said. The Crawfords already had an extra person, a bit of extra cooler space and a truck and knew with these few items a cooperative could get off the ground.

"As a group we could get into the market at a level that we couldn't as individual growers," Crawford noted. However in the beginning growers really weren't ready with appropriate production methods to be wholesalers. The cooperative ended up creating a market for produce that wasn't being grown yet. By 1988 the demand for local organic produce was growing. "Chefs loved it. Food cooperatives loved it." However, it has only been over the last two years that production is meeting the demand.

The Tuscarora Organic Growers Cooperative has retained their grower ownership since its inception. The majority of TOG's sales are in the Baltimore and Washington D.C. area. TOG offers over 1,200 produce items annually to their customers and coordinates to source product from over 50 organic family farms resulting in over $3 million in sales annually.

To keep all of this running smoothly TOG employs a general manager and runs on a small staff of five. "Most importantly is the way it's organized. Growers do not compete with each other. A production plan is made each year and is the heart of the business. According to this plan each grower is committed to grow a certain amount of a specific product for a specific time period," Crawford tells. These figures are based on voluminous records of previous demand for a product. This seems to be a key in keeping growers organized and happy. It's a tandem dance each week between grower and the cooperative and the cooperative and the buyer. Availability and price sheets are sent out twice a week to customers of the co-op and orders and produce to fill them come in like clockwork.

It's all seems based on a small but powerful sentiment out of one of Crawford's childhood reminiscences from the beginning of our tour, "food from local farms was exciting to us and still is."

Jim Crawford, owner of New Morning Farm, explains his farm operation and the Tuscarora Organic Growers Cooperative.

GENERAL

On the Road at Twin Springs Fruit Farm

Elsa Sanchez, William Lamont and Thomas Ford

Twin Springs Fruit Farm is a 75 acre farm in Orrtanna, Pennsylvania that was started in the 1970s. Tom Childs, who operates the greenhouses, gave us a tour on June 24th, 2014.

Fruit and vegetables are marketed year-round to several direct markets in the Washington, D.C. area. Greenhouses were added to the farm in 1988 and currently vegetables are grown in 32,000 square-foot or roughly ? of an acre of indoor space.

A variety of crops were growing in the greenhouses including lettuces, basil, arugula, cucumbers, tomatoes, bell peppers and eggplants. Bib and leaf lettuces were growing in an artificial medium in large troughs placed on the ground or suspended in the air (Photo 1).

Photo 1 – A nutrient film technique (NFT) hydroponic system is being installed to grow lettuce.

A new greenhouse was recently built and installed with a CropKing nutrient film technique (NFT) hydroponic system to grow more lettuce (Photo 1).

Green basil, arugula, red slicing and yellow and red cherry tomatoes, yellow, orange and red bell peppers, and purple and black eggplants were planted in systems similar to the lettuces, in troughs filled with an artificial medium (Photo 2).

Cucumbers were growing in two systems: in a perlite bag hydroponic system and in a hybrid rockwool/artificial media system.

Photo 2 – Bell peppers were growing in troughs filled with an artificial medium.

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GENERAL

On the Road... *(continued from page 17)*

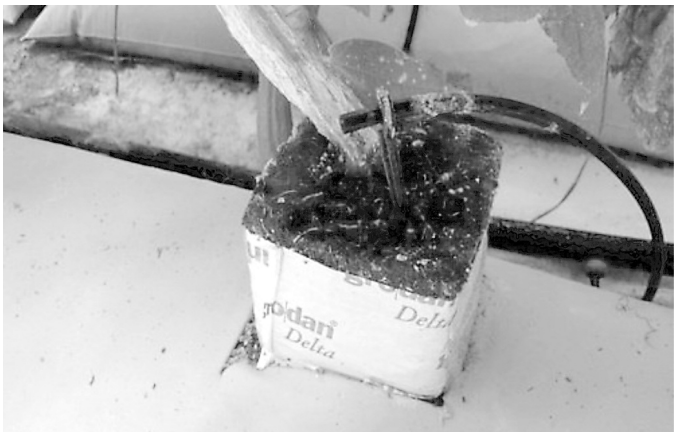

Photo 3 – Cucumbers were growing in a perlite bag hydroponic system.

In the hybrid system transplants were grown into rockwool cubes which were placed on the surface of an artificial medium in large troughs (Photo 4).

Photo 4 – A cucumber plant growing in a rockwool cube placed on the surface of media in a trough.

Bees were brought in and were pollinating the plants.

Heating of the greenhouses was with hot water generated by burning chipped wood pallets in a biomass burner. Previously heat was generated by burning coal. The chipped wood pallets are delivered in tractor trailer loads and Tom said that he used 3200 yards this season. He prefers the dried chipped pallets over green chipped lumber because of the reduced moisture which results in more efficient burning.

A state-of-the-art computer system monitors and perpetually displays the nutrient solution's electrical conductivity (EC), temperature and pH (Photo 5). With careful attention to the nutrient solution, plant nutrient problems are largely avoided.

Photo 5 - Nutrient solutions are carefully monitored.

An Integrated Pest Management (IPM) strategy focusing on the use of biocontrols is being used to manage insect pests including thrips, aphids, whiteflies and spider mites. Ladybird beetles, predatory mites and parasitic wasps, ordered from IPM laboratories, Inc., were feeding on the insect pests that were present (Photo 6). When outbreaks of insect pests occur, biorational insecticides are sprayed.

Photo 6 – Ladybird beetles preying on aphids on bell peppers.

We very much appreciated the time that Tom spent with us explaining the operation.

The authors are with Penn State University and Extension. From the ***Vegetable, Small Fruit and Mushroom Production News,*** *Penn State Extension, http://extension.psu.edu/plants/vegetable-fruit/news/2014, June 27, 2014.*

Wild Bees for Pennsylvania Cucurbits: Consider Cover Crops Targeting Critical Life Stages of the Common Eastern Bumble Bee

Shelby Fleischer

Honey bees are important pollinators. They are also considered "managed" pollinators, because people manage honey bee colonies. However, unmanaged bees, comprised of various species that exist as wild populations, also play key roles in providing pollination of cucurbit crops. The degree to which different species of bees provide pollination services varies among cucurbit crops. It also changes as the season changes, and can even vary at different times of the day.

Among the cucurbits, pollination services to crops in the Cucumis genus –cucumbers and melons – appear to be more sensitive to the need to achieve pollination by honey bees. Studies show a mix of both honey and wild bees in these crop. But even in these crops, researchers found more than 28 species of wild bees visiting cucumber flowers in addition to honey bees in central Indiana, and we have seen similar variation in Pennsylvania.

In eastern Pennsylvania and parts of New Jersey, researchers observed 44 species visiting watermelon flowers planted in small, diversified farms. The team developed individual-based models to simulate pollination services from data on visitation rates, along with number of pollen grains deposited per visit. Results showed that wild bees provided full pollination in ~90% of these farms, even though honey bees were also present. Honey bees alone provided pollination in ~70 to 80% of the farms. The presence of both honey bees and wild bees helped ensure resiliency in pollination services.

In the Cucurbita genus – the squash and pumpkin crops – wild bees may well be the dominant floral visitor, regardless of whether the field is stocked with honey bees. This has been seen in New York, Massachusetts, Virginia and in diversified farming operations in Pennsylvania. In larger 'Gladiator' pumpkin fields in 2013 in Columbia and Lancaster Counties destined for wholesale markets, measures of 4,853 bee visits showed that 67% came from bumble bees, and 25% from squash bees. Thus, wild bees provided 92% of the visits to flowers (honey bees added an additional 6%) in that year.

Among the several bumble bee species in Pennsylvania the Common Eastern Bumble Bee, Bombus impatiens, plays the key role in Pennsylvania. Overwintered solitary queens are establishing nests in late March, April, and May. During this very sensitive time in their life cycle, queens are finding and building nests, laying eggs, keeping the brood warm with her body heat, provisioning brood with pollen sometimes mixed with nectar, and rearing the first generation of brood. She needs plentiful, diverse, and high quality floral resources in close proximity to her nest. We are experimenting with a cover cropping system, planted in September of the previous year, to provide floral resources during this time. Along with providing the spring floral resources, this mix is designed to stop flowering (or be killed) by the time that the pumpkin crop needs to be pollinated (~mid July through mid August). You may have other ideas that would achieve this same purpose.

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VEGETABLE PRODUCTION

Fitting Forage Radish as a Cover Crop on Vegetable Farms

Gordon Johnson

There has been considerable research in the region with forage radish as a cover crop. It produces a giant tap root that acts like a bio-drill, opening up channels in the soil and reducing compaction. When planted in late summer, it will produce a large amount of growth and will smother any winter annual weeds. It will then winter kill leaving a very mellow, weed-free seedbed.

For forage radish to be effective there are 3 keys:

1) Plant early. Late August through early September planting should be scheduled. Later plantings will not give the same benefits.

2) You need some nitrogen. Forage radish responds dramatically to fall nitrogen and 40-60 lbs. per acre are recommended either from carryover from the previous crop or as supplemental application.

3) Do not plant too thick. Aim for 4-6 inches between plants. Thick planting produces much smaller roots and does not give the best benefits.

Vegetable systems where forage radishes have shown great benefits.

1) Compaction mitigation for spring planted vegetables. Where there are compacted fields, the use of forage radishes has worked very well as a winter killed cover crop by "bio-drilling". The extremely large taproot penetrates deep into the soil, and after winterkilling, will leave a large hole where future crop roots can grow. Winter killed radishes works well with spring planted crops such as peas and spinach.

2) Early planted vegetables. A wide range of early planted vegetables may benefit from winter killed radishes. For example, peas no-till planted or planted using limited vertical tillage after a winter killed cover crop of forage radish or oilseed radish have performed better than those planted after conventional tillage. Winter killed radishes also have the advantage of outcompeting winter annual weeds leaving relatively weed free fields and also in recycling nutrients from the soil so that they are available in the spring for early crops (decomposition has already occurred).

3) Mixed systems with windbreaks for plasticulture. By planting planned plasticulture bed areas with winter killed forage radish and areas in-between with cereal rye you can gain the benefits of these soil improving cover crops and eliminate the need make tillage strips early in the spring. The winter killed areas can be tilled just prior to laying plastic.

4) Bio-strip till. By drilling one or two rows of forage or oilseed radish and other adjacent rows with rye, you can create a biodrilled strip that winter kills and that can be no-till planted into the spring without the need for strip-till implements. This opens up dozens of options for strip tilling (seed or transplanted) spring vegetables. We have transplanted crops such as watermelons directly in to the holes left by the radishes with good success.

Dr. Johnson is the extension vegetable and fruit specialist at the Univ. of Delaware. From the Weekly Crop Update, Univ. of Delaware, Vol. 22, No. 21, August 15, 2014.

Wild Bees... *(continued from page 19)*

Trial Seed Mix, with a mid September Planting Date, to provide floral resources for the overwintered queen of the Common Eastern Bumble Bee (Bombus impatiens) during the time she establishes a nest and provisions the first brood in spring of the following year.

Crop Species	Seeding rate (lbs/ac)
Oats	30lbs (nurse crop)
Canola	5
Crimson Clover	20
Vetch	30
Austrian Winter Pea	60-70

During the mid-summer, do you want to provide additional floral resources? Some would argue this would help support bumble bee, honey bee, and other "generalist" bee species (species that visit flowers from multiple plants). Others argue that these flowers would compete with the pumpkin flowers for visitation by bees. In our current experiments, we are not adding a floral resource during the July-late August time frame, and we see good numbers of bumble bees working pumpkin fields. This is also the time frame when Bombus impatiens colonies should be at their strongest, because they should have multiple broods of workers helping support the colony.

As summer comes to a close, Bombus impatiens enters a second sensitive time. Instead of developing as workers, female offspring become reproductive, and males are produced. These new females will mate, and attempt to overwinter – they are called 'gynes'. Gynes need to acquire substantial resources if they are to successfully overwinter. Thus, we are trialing seed mixes designed to flower during the time that gynes are acquiring resources for overwintering. Again, you may have additional ideas.

Trial Seed Mix, with a July 7 Planting Date, to provide floral resources for the new queens of the Common Eastern Bumble Bee (Bombus impatiens) during the time they are foraging prior to overwintering.

Crop	Time to flower	Initial flower	Seeding rate (lbs/ac)
Buckwheat	6 weeks	Aug 19	20
Phacaelia	6 weeks	Aug 19	7
'Caliente' Mustard	6-8 weeks	Aug 26-Sep 1	5
Cowpeas	8 weeks	Sep 1	15
Sunn Hemp	10 weeks	Sep 14	8
Sunflower	12 weeks	Sep 25	??

You might consider trialing seed mixes to see what works on your farm. What seeding rates work? What plant species mixes result in flowering at what time, and are you seeing bumble bee visitations to those flowers? When can you fit this into your cropping system?

Using cover-crop types of plant species is one option that could fit well within farming systems based around annual crops. You might also consider installing some perennial species, which have different advantages and logistical issues to consider. There are a wide range of perennial species that are visited by bumble bees, and food for thought in another article.

Dr. Fleischer is with the Department of Entomology at Penn State Univ. A listing of references used in preparing this article is available upon request from Dr. Fleischer at sjf4@psu.edu or 814-863-7788. From ***Vegetable, Small Fruit and Mushroom Production News,*** *Penn State Extension, http://extension.psu.edu/plants/vegetable-fruit/news/2014, August 1, 2014.*

Pumpkin Viruses

Jerry Brust

A number of pumpkin fields in Maryland have a great deal of virus infected plants (20-50%) while other pumpkin fields have none. Why the large differences in infection levels? This is something I have been looking at for the past two seasons. It has to do with what is around the pumpkin field and how long pumpkins and squash have been growing in the general area. I'll have more on the results of this study at this year's winter vegetable meetings. Almost all of the viruses found so far have been Watermelon mosaic virus-2 (WMV), with a small percentage being Zucchini yellow mosaic virus (ZYMV). The most common symptoms caused by these viruses are a leaf mosaic (variegated patterns of dark and light green to yellow that form a mosaic) and leaf distortion (Fig. 1). Symptoms may vary from plant to plant according to the species or varieties, viral concentration in the plant, timing of infection, single or mixed infection, or temperature. External symptoms may develop within four or five days after young plants become infected, but may take up to 14 days to develop when the foliage is older and more mature. Symptoms develop more rapidly at 80°-90°F than at 65°-75°F. Virus symptoms are more severe on plants exposed to short days or reduced light than on plants exposed to long days and bright light. Cucurbit plants rarely become infected in the seedling stage. When this does happen, the cotyledons may turn yellow and wilt. New leaves are slightly mottled a yellowish green and remain small, wrinkled, and distorted.

Typically, viruses affect pumpkin fruit by causing lumps, bumps and rings to appear on the skin of the fruit. However, at times there is little loss if the pumpkin fruit has been pollinated and begins to grow before virus infection occurs (Fig. 2). Figure 2 shows a pumpkin plant with a new WMV infection, the larger pumpkin fruit will develop normally, but the smaller fruit just pollinated will not develop at all and will be aborted by the plant. Infection just after pollination may cause the pumpkin fruit to have blotches or stripes of green or yellow color. If the plant is infected before pollination there usually is no fruit production, but if some are produced then symptoms on the fruit include surface discoloration, bumps and other fruit deformity, early browning, shrinking or death, small fruit size and poor yields. Secondary infection by other microorganisms may occur on the virus infected fruits and cause soft rot.

Figure 1. Pumpkin plant infected with WMV

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Pumpkin Viruses *(continued from page 21)*

Figure 2. Larger pumpkin fruit (yellow arrow) will develop normally while smaller fruit will not (red arrow)

On pumpkin plants, viruses can either infect the plant alone or together. If a plant is infected by only one virus, the symptoms generally are milder (Fig. 3) than if by two or more (Fig. 4). Infection by two viruses initially causes a strong mosaic and distortion of leaves. Infected plants have smaller and smaller new leaves. Late stage infections consist of leaves that turn yellow or become scorched along the edge.

Figure 3. Pumpkin plant infected with one virus

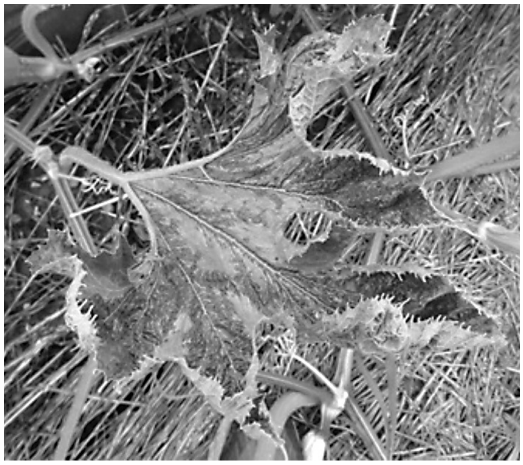
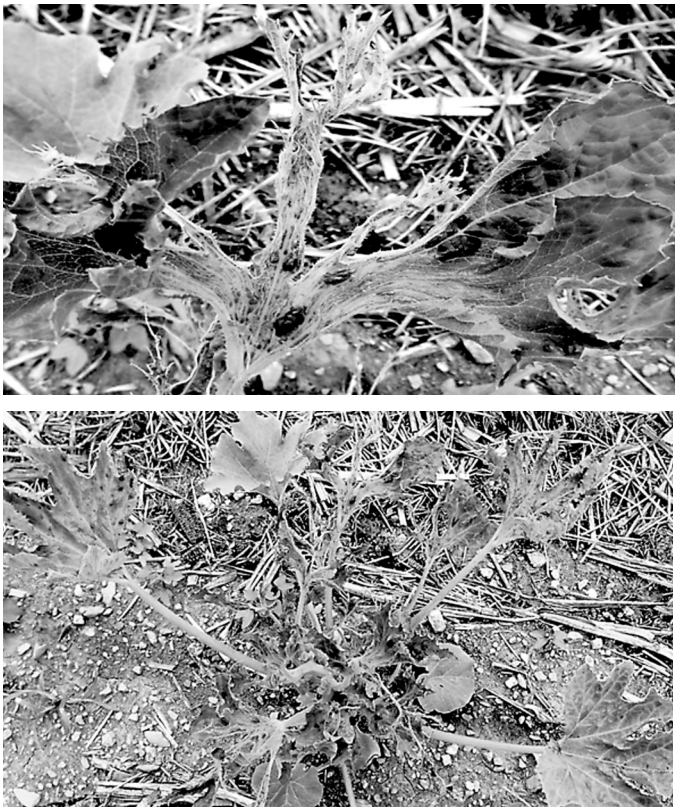


Figure 4. Pumpkin plant infected with 2 viruses

Aphids transmit viruses to plants through their sucking mouthparts. Viruses that are non-persistently transmitted, as are most pumpkin viruses, are difficult to manage because the aphids acquire and transmit the viruses so quickly. The acquisition or transmission of non-persistently transmitted (NPT) viruses is completed in a matter of seconds or minutes. NPT viruses cannot spread very far from where they were originally acquired by the aphid. Pesticides sprayed on the plant will eventually kill the aphids, but too late to stop them from transmitting the virus. Therefore, insecticides have little effect on initial infection rates of NPT viruses transmitted by transient, non-colonizing aphids (these are aphids that are passing through the field, land on and taste the pumpkin plant, do not like it and move on, but they have transmitted the virus). Insecticides can control aphid honeydew production and secondary spread of viruses in the field.

One thing I've seen that is new or at least different is severe distortions or deformities of pumpkin plants because of infection with just watermelon mosaic virus-2 (WMV). Normally this virus, if it is the only virus in the plant, results in mild mottling symptom. However, pumpkin plants I have seen in fields with severe deformities had only WMV in them. This is problematic as WMV is the most common pumpkin virus in our area. If this "strain" (I am calling it that because I am not sure what else to call it) becomes common then yields of pumpkin could bereduced by 20-35% each year. This 'strain' of WMV also was found in Utah.



Serious foliar deformations in pumpkin due to infection by a 'severe strain' of WMV.

Dr. Brust is IPM Vegetable Specialist with the Univ. of Maryland. *From the **Weekly Crop Update,** Univ. of Delaware, Vol. 22, Nos. 20 and 21, August 8 and 15, 2014.*

Watch for These Fall Diseases of Brassicas

S. B. Scheufele and M. B. Dicklow

Fall, with its cooler temperatures and shorter days, is the time when fall brassica crops tend to look terrific—broccoli is at its best, flea beetles seem to evaporate (though they can still be found in some fields in mid September) as they depart the field for overwintering sites in the border, and caterpillars grow more slowly so that, as long as you don't ignore them completely, they are easy to control. However, it's worth keeping a close eye on these crops, as fall is also the time when diseases of brassicas can quickly take off and reduce yield and quality, especially in leafy greens and storage crops. There are a few major diseases of brassicas which share much in common—they can all be seed-borne; they can survive in crop residues in soil for about two years; they are spread by wind, splashing water and insects like flea beetles; and they are favored by moist conditions. This means that the following preventive, cultural practices will go a long way in reducing the impacts of all a the diseases described below:

Start with disease free seedlings. All of these diseases are commonly introduced on infested seed. Talk to your supplier to be sure the seed has been tested or, better yet, hot water treat your seed to eradicate bacteria, fungi, and oomycetes that may be present. Avoid overwatering and encourage air flow through greenhouses. Monitor transplants in the greenhouse and remove any symptomatic plants.

Plant into a clean field. Rotate out of brassicas (including weeds like shepherd's purse, wild radish, field pennycress, etc.) for 2-4 years. Any amount of rotation you can do will help and the further the better, as these diseases can be dispersed by wind and insect feeding. Chopping and burying infested residue quickly after harvest will shorten the period of time the organisms persist in the soil. For example, avoid leaving diseased Brussels sprouts stalks standing in the field through the winter; mowing them is better than nothing if you can't disk them in. Manage cull piles well so that they do not become sources of inoculum.

Reduce leaf wetness. All of these diseases require moisture to grow and spread. Increase plant spacing so plants will dry off more quickly and so the pathogens can't easily spread from plant to plant. If overhead irrigation is necessary, or when watering in the greenhouse, water on a sunny day when leaves will dry quickly.

Control insects and remove weeds. Flea beetles can move fungal spores and bacteria from plant to plant and field to field. A study showed that spores of *Alternaria brassicicola* occur on their bodies, in their mouths, and in their feces, and that flea beetles actually concentrate alternaria spores in their mouthparts when they clean their antennae. The insects move from plant to plant, basically injecting spores and bacteria into wounds they create through their feeding. Reducing flea beetle pressure will also reduce the spread of diseases through the field. Similarly, cruciferous weeds can harbor diseases and act as bridges between fields and between seasons. Weeds also crowd the crop, increasing moisture and leaf wetness in the row making the environment around the plant more conducive to disease.

Chemical control. There are many effective pesticides to control these diseases, please see the [Commercial Vegetable Production Recommendations for Pennsylvania] for chemical recommendations. Copper products and plant defense activators like Actigard or Regalia are the best choices for managing black rot. Avoid using excessive pressure when spraying for black rot as this can very efficiently spread the bacteria throughout the planting and can cause abrasions and wounds through which the bacteria can enter the plant—use only enough pressure to get good coverage. OMRI approved fungicides have not shown good efficacy for other diseases but many copper products, plant defense activators like Regalia, and other biopesticides are labeled for downy mildew, black rot, and alternaria—check labels.

Black Rot is one of the most devastating diseases of brassica crops, and can result in high losses of yield and quality.

The bacterium, *Xanthomonas campestris* pv. *campestris,* plugs the water-conducting tissue of the plant with xanthan, a mucilaginous sugar causing chlorosis (yellowing) and wilt of tissue. Seedlings are commonly affected but symptoms can appear at any growth stage or an infected plant may appear symptomless. The most common and characteristic symptom is a yellow, V-shaped lesion that extend from the leaf margin toward the base of the leaf, caused by bacteria entering through guttation droplets that form at the hydathodes. Lesions can also occur mid-leaf, as darkened dead patches of tissue between the veins, where wounding from insect feeding, hail, or mechanical injury has occurred. The pathogen may move into the plant vasculature and infected veins turn black as they are plugged with xanthan, and the normal flow of water and nutrients is impeded. Blackened veins may also appear in root crops like rutabagas even though foliar symptoms may not be present. On heading crops, infection may spread into the leaves of the head and is often followed by invasion by soft-rotting organisms.

Black rot is commonly transmitted by seed, and a seed lot with as little as 0.03% infected seed can cause an epidemic. The bacteria can persist in infected plant debris for up to two years, but can only survive for 40-60 days in the soil in the absence of host tissue. Disease development is favored by warm, wet weather and is spread within the field by splashing water, wind, equipment, workers, and by insects such as through flea beetle feeding. *X. campestris* pv. *campestris* can be spread long distances or introduced into new areas by infested seeds and transplants.

Alternaria leaf spot is a fungal disease that affects all cultivated brassicas, causing small black spots that grow into large lesions with characteristic concentric rings on leaves, stems and heads. The disease can be caused by several fungi in the genus *Alternaria,* but the most damaging species in the production of vegetable brassicas are *A. brassicae* and *A. brassicicola.* Disease development is favored by cool temperatures and long periods of leaf wetness or high relative humidity, and Alternaria leaf spot can be a limiting factor in the production of vegetable and seed crops in regions where these conditions are common. Infection can cause reduction in crop quality and yield through damage to seeds, seedlings, leaves, and heads, and can also spread during storage of vegetable crops like cabbage. Brussels sprouts can be rendered unmarketable by numerous small spots on the buds. Brown, sunken spots on heads of broccoli and cauliflower can make those crops unmarketable. The disease can spread in storage so management is especially important for cabbage and other storage crops. Inspect these crops for early symptoms before storing. In recent years, as a wider range of brassica crops and a longer growing season

(continued on page 24)

Watch for These... (continued from page 23)

through season extension have led to increased brassica production in New England, this disease has become more severe and is causing more losses, especially in fall crops.

The initial symptoms of Alternaria leaf spot are small black dots surrounded by chlorotic haloes. As the disease progresses lesions expand into characteristic, dark brown to black circular leaf spots with target-like concentric rings. The centers of lesions often turn brown and crack or fall out, giving the leaf spots a shot-hole appearance. Individual spots coalesce into large necrotic areas and leaf drop can occur. Lesions can occur on petioles, stems, flowers, flower pedicels, and seed pods. Pod infection causes distortion, premature shattering, and shriveled, diseased seed that germinate poorly.

Alternaria species overwinter primarily in diseased crop debris. Lignin-rich stalk tissues can persist in the soil for over two years, and the fungi can remain active on that tissue as long as it is present. Disease development is favored by temperatures of 60-78° F and 12 hours of relative humidity of 90% or more. The main means of introduction into new areas is on infested seed. However, spread from one infected crop into nearby crops occurs easily once the disease is established on a farm. The fungi sporulate profusely and are spread throughout fields by wind, splashing water, equipment, and workers.

In 2009, a Brussels sprout variety trial was conducted by the UMass Vegetable IPM Program. Seven varieties were evaluated—Vancouver, Franklin, Nautica, Diablo, Dimitri, Roodnerf and Oliver. Among these varieties, Oliver and Franklin showed significantly more disease damage than the other cultivars. There are many fungicides with efficacy against Alternaria leaf spot including Quadris, Endura, and Bravo among others—please see the [Commercial Vegetable Production Recommendations for Pennsylvania] for recommendations. Research on the efficacy of biological fungicides (eg. Serenade, Sonata, and Actinovate, etc.) to control Alternaria in cabbage is ongoing at the UMass Research Farm, look for those results over the winter.

Downy mildew caused by the fungus *Hyaloperonospora parasitca,* is an important disease of broccoli, collards, kale, cabbage, cauliflower and Brussels sprouts, as well as root crops such as rutabaga, turnip and radish. There are many downy mildews, seemingly every crop has one, but they are all unique and very host specific—if you have cucurbit downy mildew you don't need to worry about it infecting your brassicas, or the other way around. Disease development is favored by cool, moist conditions caused by rain, heavy dew, or fog. Infection can occur at any stage of growth. On seedlings, slighty yellow patches appear before whole leaves and cotyledons turn yellow and drop. Early infections can also be symptomless until seedlings are transplanted to the field and conditions become favorable. Irregular, angular yellow to brown spots develop on both the top and bottom of the leaf and a characteristic grayish-white, fluffy growth on the undersides of leaves appears. In the floral parts of broccoli or cauliflower, dark brown areas develop internally in curds or floral buds of the head. Stems and stalks of the flower head may be darkened or have black streaks, and this may be the first sign of infection in broccoli. In cabbage, internal darkening and purplish spots appear in the inner layers of the head or move upward in the head from stem infections. The disease can spread in storage and infected plants are susceptible to secondary infection with soft rot bacteria, resulting in a stinky puddle of rotten cabbage.

Unlike other downy mildews that blow in from afar each year, *Hyaloperonospora parasitica* can survive from season to season as thick-walled resting spores, called oospores, in the soil or crop debris. These sexual spores can survive in the soil for extended periods and produce sporangia when conditions are moist and cool, especially at night. Other sources of initial inoculum are infested seeds, or cruciferous weed hosts. Disease development is favored by abundant moisture on leaves provided by dew, drizzling rain, or heavy fog, and by temperatures of 50-60°F. Sporulation, germination, and reinfection can occur in four to five days. Sporangia (secondary, asexual spores) are spread throughout the field by wind, splashing rain, and by feeding insects. This disease commonly infects plants early on but shows no symptoms until environmental conditions become favorable and suddenly all the plants begin to show symptoms later in the season. Resistant or tolerant varieties of broccoli have been developed; our sources list Marathon and Arcadia among these.

Blackleg (*Phoma lingam*) causes a leaf spot and a stem canker on many cruciferous crops, especially cauliflower, broccoli, and turnip. Rutabaga, radish, and mustard cultivars are only slightly susceptible. This disease can spread rapidly within a field. Initial symptoms are small lesions on stems at cotyledon stage which elongate, turn brown with a black to purplish border, and become sunken. The lesion extends up and down the stem, the stem becomes girdled and blackened, with many fruiting bodies (pycnidia) embedded in the tissue. Lesions may extend below the soil and attack roots. Diseased plants often wilt, lodge, and die. On root crops, symptoms occur in the form of cankers on the fleshy roots and a dry rot may appear in storage.

Phoma lingam is a fungus which can survive for up to four years in seed and three years in infected crop debris. Plants can become infected at the seedling stage or at any stage in the field. The initial source is probably infected seed. The disease spreads by spores which are exuded from pycnidia in long coils and are splashed to nearby plants to initiate new infections.

The disease is favored by wet conditions, though it may get an early start on seedlings in the greenhouse and cause problems even in dry, sandy fields. The disease has become less important in brassica crops because of successful disease management strategies in seed production. Once present on the farm, management should focus on avoiding spread of the disease by rogueing out affect plants and reducing soil moisture.

The authors are with the Univ. of Massachusetts Extension.

From ***Vegetables Notes for Vegetable Farmers in Massachusetts,*** *Univ. of Massachusetts Extension, Vol. 26, No. 20, August 28, 2014.*

Calcium and Boron Deficiencies in Cole Crops

Gordon Johnson

Calcium Deficiency

Calcium deficiency is most commonly seen as tipburn of cauliflower, cabbage, and Brussels sprouts. This problem can cause severe economic losses. Tipburn is a breakdown of plant tissue inside the head of cabbage, individual sprouts in Brussels sprouts, and on the inner wrapper leaves of cauliflower. It is a physiological disorder which is associated with an inadequate supply of calcium in the affected leaves, causing a collapse of the tissue and death of the cells. Calcium deficiency may occur where the soil calcium is low or where there is an imbalance of nutrients in the soil along with certain weather and soil nutrient conditions, such as high humidity, low soil moisture, high potash or high nitrogen all of which can reduce calcium availability. Secondary rot caused by bacteria can follow tipburn and heads of cauliflower can be severely affected. Some cabbage and cauliflower cultivars are relatively free of tipburn problems.

Cabbage varieties with good resistance to tipburn include Artost, Blue Vantage, Bobcat, Cecile, Emblem, Green Cup, Megaton, Padok, Platinum Dynasty, Quick Start, Royal Vantage, Solid Blue 780, Superstar, Thunderhead, and Vantage Point. Check with your seed supplier for tipburn ratings for other varieties.

Controlling tipburn starts with managing liming so that soil pH is above 6.0. Avoid using only ammonium forms of nitrogen, and ensure an adequate and even supply of water. Adjust planting date so that head maturation occurs during cooler temperatures. Plant a cultivar that is less susceptible to the disorder. In general, calcium foliar sprays have not been shown to be effective for controlling tipburn incidence.

Boron Deficiency

Cole crops have a high boron requirement. Symptoms of boron deficiency vary with the cole crop. Cabbage heads may simply be small and yellow. Most cole crops develop cracked and corky stems, petioles and midribs. The stems of broccoli, cabbage and cauliflower can be hollow and are sometimes discolored. Cauliflower curds become brown and leaves may roll and curl. It is important to note that cole crops are also sensitive to boron toxicity if boron is over-applied. Toxicity symptoms appear as scorching on the margins of older leaves.

It is recommended in broccoli and kale to apply 1.5-3 pounds of boron (B) per acre in mixed fertilizer prior to planting. In Brussels sprouts, cabbage, collards and cauliflower, boron and molybdenum are recommended. Apply 1.5-3 pounds of boron (B) per acre and 0.2 pound molybdenum (Mo) applied as 0.5 pound sodium molybdate per acre with broadcast fertilizer. Boron may also be applied as a foliar treatment to cole crops if soil applications were not made. The recommended rate is 0.2-0.3 lb/acre of actual boron (1.0 to 1.5 lbs of Solubor 20.5%) in sufficient water (30 or more gallons) for coverage. Apply foliar boron prior to heading of cole crops.

*Dr. Johnson is the extension vegetable and fruit specialist at the Univ. of Delaware. From the **Weekly Crop Update,** Vol. 22, No. 22, August 22, 2014.*

Irregular Growth in Vegetables Grown Under Plasticulture

Gordon Johnson

Each year we see fields were vegetable growth in drip irrigated plastic mulched beds is irregular. While root diseases, nematodes, or soil insect feeding can cause variable growth, the following other potential causes due to water quality problems, cultural practices, or irrigation system issues.

Plugged Emitters - Drip emitters can become plugged with fine particles, mineral deposits, or biofilms. When emitters become clogged, the plants nearest the clogs will receive less water and have more water stress and grow less or be stunted. This is seen most commonly in higher density planted crops such as peppers.

A common cause of plugged emitters is water containing high levels of dissolved iron. This often causes a proliferation of iron utilizing bacteria. These bacteria can form heavy biofilms on the inside of the drip tube. They also oxidize the iron in the water (as part of their metabolism) and leave behind iron precipitates that can plug emitters. Chlorination of drip lines is needed to control iron bacteria.

Another common problem in some aquifers, is well water with high levels of calcium and magnesium ("hard water"). In high water pH conditions, these can precipitate out as calcium or magnesium carbonates that will clog emitters. If you look inside the drip tubing you will see a white or chalky film. In addition, if soluble phosphorus fertilizers are put into water with high levels of dissolved calcium or magnesium salts, they can precipitate out as calcium or magnesium phosphates, also plugging emitters. Acidification of water can reduce or eliminate this problem. Also, avoid running phosphorus through the drip if you have hard water.

Inadequate filtering is another possible cause of plugged emitters. While this is most common when using surface water from ponds, ditches or streams it can also occur in wells that have fine particles in the water.

Improperly Designed or Maintained Drip Systems - Improperly designed drip systems can lead to over-watering or under-watering portions of the bed and cause variable crop growth. This most commonly occurs when systems are in too large of zones or have too small of supply lines where pressure and volume is too low or where length of run is too long. In these cases, the ends of the drip line will have much less water than the beginning of the run and will lead to a gradient of plant growth. Leaks in drip lines will also cause lower water delivery past the leak, leading to reduced plant growth.

Variable Depth of Planting and Transplant Handling - Many transplanted crops will show variability due to depth of planting. This is most common when the root ball is left partially exposed and dries out. If these plants survive they often will be stunted or will have reduced growth compared to plants around them. Planting too deep can also lead to variability in some plants. Rough handling or root ball disturbance can slow establishment of sensitive transplants leading to variability.

Variable Bed Formation - Variability in bed density and plastic laying can cause differences in plant growth. This is most common when plastic is laid in cloddy soils. This results in variable bed densities affecting root growth and water movement and variability in plastic contact with the soil surface leading to warm and cool spots thus slowing or speeding plant growth.

*Dr. Johnson is the extension vegetable and fruit specialist at the Univ. of Delaware. From the **Weekly Crop Update,** Univ. of Delaware, Vol. 22, No. 19, August 1, 2014.*

VEGETABLE PRODUCTION

Peppers: Watch for Pepper Maggot Fly and European Corn Borer

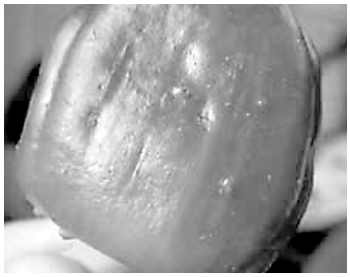
Pepper maggot fly (*Zonosemata electa*) adults emerge in mid to late July and are active for several weeks, so this is the time to watch for their activity. The fly is confined to solanaceous plants, including ground cherry, horse nettle, tomato, pepper and eggplant. Pepper is the preferred host, cherry pepper and green bells being most susceptible to pepper maggot fly damage.

The pepper maggot fly is found throughout eastern North America. In New England, the range of pepper maggot has been creeping northward into southern New Hampshire and throughout Massachusetts. Within their range, populations are spotty and rather unpredictable – that is, pest status is often a farm-by-farm or field-by-field phenomenon without any clear reason for high or low populations that occur in a particular place.

Life cycle and damage. Pepper maggot flies are smaller than a house fly, bright yellow with three yellow stripes on the thorax, green eyes, and clear wings with a distinct banding pattern. Flies aggregate in forested field edges and enter the field during the day to lay their eggs. Females insert eggs directly into immature pepper fruit and leave a small dimple – an ovipositor sting or scar. Eggs hatch after about 10 days and the white maggots then feed and tunnel inside the fruit, especially in the placenta, causing soft spots on the wall of fruit and brown mines within. Maggots reach about ? inch in length over a period of about two weeks. Unlike European corn borer caterpillars, they have no legs, no markings, and no distinct head capsule. When they are ready to pupate, they exit at the blossom end, leaving tiny round exit holes.

These holes allow for the entry of soft rot bacteria into the fruit. Sometimes the oval brown pupae can be found inside the fruit. Often damage is detected only because of premature ripening or decay of the fruit.

Pepper maggot monitoring: The best way to detect activity is to look for stings on the fruit. Cherry peppers are useful for monitoring the beginning of flight, as the adults prefer to lay eggs in the small (1-3 cm in diameter) round fruit However, bell peppers also show the stings (see photo). Monitor weekly to detect flight.



Pepper maggot damage

Pepper maggot threshold and control: If stings are observed on fruit, take action for control within the next week. An effective treatment that can be used in both organic and conventional fields is the product Seduce, a granular bait formulation of spinosad produced by Certis. Spread the bait on the ground or plastic below the plants, and reapply every two weeks. Jude Boucher of UConn has worked with Crop Production Services to make this available in New England (currently in Windsor Connecticut and eastern New York). Prior to this it was only offered in states south of the Mason-Dixon line. This product only lists earwigs and cutworms, but is labeled for most vegetable crops, so can be legally used for maggot flies.

A farmer in Connecticut tried it last year on pepper maggot and had near 100% control. Chemical control requires two insecticide applications, 10-14 days apart, with a material labeled for pepper maggot, which include Dimethoate, Mustang, and GF-120 Naturalyte (spinosad). See [Commercial Vegetable Production Recommendations for Pennsylvania] for more details on using these products.

European Corn Borer (ECB) is a resident pest that has 2 generations per year in southern and central New England and 1 generation in northern New England. Pepper is one of over 200 crop and weed host plants of this pest. The severity of ECB in peppers varies in Massachusetts and around New England. Some farms – typically in areas where farming is less dense and ECB populations have not built up – do not see much damage from this pest. In the Connecticut Valley and in Southeastern Massachusetts, an unsprayed pepper field is likely to have anywhere from 10 to 50% of the fruit infested. In some cases, it seems that sweet corn – which ECB prefer over peppers – helps to draw ECB away; in other cases, presence of sweet corn near peppers provides no benefit at all. Use flight counts and historical experience to help you decide which applies to you.

Getting good ECB control is especially critical when you want to sell ripe colored peppers. In southern and central New England, ECB generally does not become a pest in peppers until the appearance of the second generation in late-July or early-August. Check state sweet corn IPM reports for flight activity, or use pheromone traps for monitoring adult flight activity. Make first application 1 week after moth count equals or exceeds 7 moths per week and > 1/2 inch fruit are present on the plants. Discontinue sprays 1 week after moth counts drop below 21 moths per week.

The spray interval depends on the residual period of the insecticide used as well as weather conditions and pest pressure. Choose selective material such as Radiant, Intrepid, Entrust (OG), Coragen, Avaunt, or Bt aizawi or Bt Kurstaki. Bt products conserve natural enemies and reduce the chance of aphid outbreaks because they are selective. Pyrethroids may cause aphid outbreaks by eliminating their natural enemies.

Using Trichogramma wasps for biological control of ECB in pepper. Trichogramma ostriniae attacks only the egg stage, so timing is critical. We recommend that you begin releases the week that flight begins and continue weekly releases for a total of 4 weeks. Release 90,000 to 120,000 wasps per acre and spread the cards out throughout your pepper block.

Higher rates are needed in peppers compared to sweet corn because the tolerance for damage is virtually zero and ECB larvae attack the fruit directly. Four releases are needed because the egg laying period for the second generation is longer than for the first generation of ECB. Fortunately, peppers are also a higher value crop and worth the extra cost. After four releases, Trichogramma will have reproduced in the field and biocontrol should continue. Wasps can be ordered from IPM

Laboratories, at www.ipmlabs.com or by phone, 315-497-2063. Wasps can also be used in combination with insecticide; if so, choose a selective material (see above) that will not kill wasps.

Ms. Hazzard, is with the Univ. of Massachusetts Extension.

Compiled from material from J. Boucher, University of Connecticut Extension.From ***Vegetable Notes for Vegetable Farmers in Massachusetts,*** *Univ. of Massachusetts, vol. 26, No. 14, July 17, 2014.*

Southeast Strawberry Expo Set for November 17 to 19

An outstanding line-up of speakers will present educational programs and workshops at this year's Southeastern Strawberry Expo, in Pinehurst, North Carolina.

The Expo's Farm Tour will be on the afternoon/early evening of Monday, Nov. 17th and will include three visits – you will see our most innovative strawberry plasticulture growers in the Sandhills, including a farm that is now using low tunnels for fall fruiting!

Our keynote speaker is Dr. Vance Whitaker, one of the country's leading strawberry breeders, from the University of Florida Strawberry Breeding and Genetics Program. His presentation, "46 Years of Strawberry Breeding in Florida" will share points on what is important to breeding efforts and what kinds of traits, breeding techniques and cultivars will be available in the future. Other featured speakers include Dr. Natalia Peres, plant pathologist from the University of Florida, Dr. Guido Schnabel, plant pathologist of Clemson University, and Dr. Kim Lewers, research geneticist with the U.S. Department of Agriculture.

The always-popular Intro to Strawberry Plasticulture Workshop will run all morning on Monday, Nov. 17, and each participant will get a newly revised Strawberry Plasticulture Manual. The workshop is being organized by Mike Wilder, Agronomist, NCDA & CS, and Barclay Poling, Prof. Emeritus, North Carolina State, and they will be joined by Mitchell Wrenn, an experienced strawberry grower and custom fumigator and plug propagator, as well as Horticultural Agent, Amy-Lynn Albertson, Davidson County, who has worked with numerous start-up strawberry plasticulture growers in the western piedmont counties of North Carolina. If you are new to strawberry growing, be sure to sign up for this workshop!

On Tuesday evening of the Expo, a session focused on Regional Breeding and Strawberry Plasticulture Extension Positions is being designed as a "listening session." It will include university officials from the Southeast region; the purpose will be to discuss and gather information regarding a possible regional breeding research and extension position to support the industry. North Carolina State University lost its strawberry researcher earlier this year and has not filled an extension specialist position from three years ago. The information collected will be shared with Dr. Richard Linton, dean of the North Carolina State University College of Agriculture & Life Sciences.

For more information on the Expo, visit www.ncstrawberry.com or call 919-537-2287.

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