

NEWS

for the commercial vegetable, potato and berry grower

March 2014 / Volume 37 Number 3

Farm Show Booth Earns \$40,000 Profit

Like the rest of this winter, Farm Show week in Pennsylvania was cold. The cold weather combined with an ice storm the opening weekend resulted in fewer people attending the show and consequently fewer sales at the PVGA food booth. Still, the Association's dedicated volunteers earned a profit of about \$40,000 at the 2014 Farm Show.

The Association's Farm Show Food Booth directly involves a personal commitment from hundreds of PVGA members. Sales, at \$169,600 were down about 10% from last year's record sales of \$187,600. Thanks to the help of over 40 volunteers each day who filled 350 shifts during the eight and half days of the Farm Show, PVGA still earned a good profit. The \$40,000 translates roughly into about \$114 profit for each volunteer shift.

The new menu item this year was a delicious berry funnel cake to complement the pumpkin funnel cakes introduced last year. It featured berries in the batter as well as a berry topping. The menu also included batter-dipped vegetables, blooming onions, strawberry slush drink, raspberry lemonade, vegetable soup, chicken corn soup, broccoli-cheese soup, chili, broccoli-cauliflower and bean salads, carrot/celery sticks, dill pickles, mixed berry pie and pumpkin pie, and vegetable wraps. Sales included:

- 8,000 servings of batter-dipped vegetables
- 8,800 Strawberry Surprise and raspberry lemonade drinks;
- 5,275 bowls and 269 quarts of vegetable, chicken corn, broccoli/cheese and chili soups or about 523 gallons;
- 4,750 blooming onions;
- 2,800 funnel cakes;
- 2,000 bowls of broccoli/cauliflower and bean salads;
- 1,700 dill pickles;
- 750 pieces of Very Berry and pumpkin pie; and
- 698 vegetable wraps

PVGA Funds a New Record Amount of Research

The Pennsylvania Vegetable Growers Association Board of Directors budgeted \$80,000 for vegetable and small fruit research in 2014 although only \$76,200 will actually be spent. This year's contributions put PVGA's funding for research over the past 26 years at over \$793,000.

The research funding has been made possible solely through the profits earned at the Association's food booths at the Farm Show and Ag Progress Days. While the Association earned much less than \$76,200 at the Farm Show and Ag Progress Days booths, this amount of research grants would not be possible without these food booth profits. Surplus income from the Mid-Atlantic Convention and General Fund reserves are helping to fund the 2014 research grants. This

Due to the work of Farm Show Task Force chairman Bill Reynolds, this year's booth featured new banners and signs that greatly improved the booth's appearance. He also made arrangements for a large flat screen television where pictures from PVGA members' farms were shown throughout the week. Nancy Grace put together the slide show from pictures submitted by members. New countertops further improved the booth's appearance.

Jack Grace and his daughters Jackie and Nancy of Grove City graciously volunteered for the fourteenth year to oversee the soup-making operations and assist in overall management throughout the week.

Michael's Concessions of Northampton, a family business that operates concessions at fairs and carnivals throughout the year did the actual preparation and frying of the batter-dipped vegetables, blooming onions and funnel cakes while PVGA volunteers served and sold them. PVGA volunteers also helped prepare the vegetables. The produce for the batter-dipped vegetables and blooming onions was supplied by Kegel's Produce.

We will be publishing the Volunteer Honor Roll in next month's newsletter to recognize those who made the effort to come to Harrisburg to help out. If you didn't help this year, please volunteer to help next year. The more new volunteers we have, the less time we need to ask of our veteran volunteers. We are also looking for some members who would have an interest in helping to manage the Food Booth – please contact Bill Troxell at 717-694-3596 or pvga@pvga.org if you would consider taking a more active role in making the Farm Show Food Booth profitable for the Association. The Farm Show Food Booth, along with the Ag Progress Days Food Booth, make it possible for the Association to support research and promotion activities.

year, PVGA will contribute \$56,000 towards vegetable research, \$10,000 to help support a tomato breeding technician at Penn State and \$10,200 for small fruit research. While \$14,000 was budgeted for small fruit research, the proposals funded will only require \$10,200.

The following vegetable projects are being funded in conjunction with the Vegetable Marketing and Research Program which will contribute another \$20,000 for a total \$76,000 for vegetable research. The projects approved for funding are listed below. In addition, the Association's Simply Sweet Onion Committee will contribute an additional \$6,500 toward two onion research projects.

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NEWS



**Pennsylvania
Vegetable Growers
Association**

An association of
commercial vegetable,
potato and berry growers.

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Richfield

PVGA Funds... (continued from page 1)

Breeding Tomatoes for Early Blight and Late Blight Resistance and Other Desirable Horticultural Characteristics for Production in Pennsylvania

Majid R. Foolad, Penn State Univ. \$12,000 Efficacy of Biochemical and Microbial Biofungicides for the Management of Late Blight on Tomatoes

Beth K. Gugino, Penn State Univ. \$3,280 Plum / Roma Tomato Variety Trial 2014

Steven Bogash, Penn State Extension \$4,919 Western Flower Thrips Management in Field Staked Tomatoes

Steven Bogash, Penn State Extension \$5,874 Development of Insect Resistant Sweet Corn Cultivars

Surinder Chopra and Shelby Fleischer, Penn State Univ. \$4,500 Keeping Pennsylvania Vegetable Growers Profitable: Statewide Broccoli Cultivar Trials

Elsa Sánchez, Tim Elkner, Tom Butzler, Steve Bogash, Lee Stivers, Bob Pollock, Bill Lamont, Penn State Univ. and Extension \$10,548 Striped Cucumber Beetle Management with Plant and Microbial Metabolites

Shelby J. Fleischer and Tim Elkner, Penn State Univ. and Extension \$4,500 Disease Resistant Pumpkin Variety Evaluation

Timothy Elkner, Penn State Extension \$4,000 High Tunnel Trellised Cucumber Variety Trial, Year 2

Steven Bogash, Penn State Extension \$2,786 Colored Bell Pepper High Tunnel Economics Trial; Year 2

Steven Bogash and Timothy Elkner, Penn State Extension \$4,390 Evaluating Potential Herbicides for Row-Middles with Plasticulture

Mark VanGessel, Univ. of Delaware and Dwight Lingenfelter, Penn State Univ. \$5,000

Developing Data to Support New Herbicide Registrations for Snap Beans

Robin Bellinder, Cornell Univ. \$6,000

Survey of Soilborne Snap Bean Pathogens in Pennsylvania and Establishment of a Research Plot Dedicated to Snap Bean Root Pathogen Research

Beth Gugino, Penn State Univ. \$2,923

Survey of the Survival of *E. coli* from Manure under Field Conditions

Jeffrey LeJeune, Ohio \$2,500

Continued Evaluation of the Effects of Inoculum Pressure and Onion Maturity at Harvest on Harvest and Post-Harvest Losses Due to Bacterial Diseases

Beth K. Gugino and Emily E. Pfeifer, Penn State Univ. \$2,779

The Simply Sweet Onion Committee will provide an additional \$4,000 for the above onion project and will also fund an onion variety trial conducted by Michael Orzolek at Penn State Univ. with a grant of \$2,500.

The three small fruit research projects funded are:

Evaluation of Low Tunnels for Day-Nuetral Strawberry Production

Kathleen Demchak and Richard Marini, Penn State Univ.; and Kim Lewers, USDA \$2,800

Evaluation of Strawberry Cultivars and Selections for Plasticulture and Matted-Row Production

Kathleen Demchak and Richard Marini, Penn State Univ. and Timothy Elkner, Penn State Extension \$6,300

Effect of Irrigation Water Treatment on Strawberry Production

Kathleen Demchak, Luke Laborde and Richard Marini, Penn State University \$1,100

Directors Hold “Spring” Meetings

On March 4, the PVGA Board of Directors met for their regular “spring” meeting – it was not quite officially spring and the weather certainly was not spring-like! The meeting was held in conjunction with the Vegetable Industry Strategic Planning Initiative statewide session held on March 5 at the Penn Stater Conference Center Hotel in State College. In addition, the Board met again on March 25 at the Toftrees Conference Center and Resort in State College to develop a workplan for implementing objectives identified through the strategic planning process. Another telephone conference call is being planned to further develop these plans.

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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 - pvg@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 future 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

Industry Support Is Important for Penn State

At the mid-Atlantic Fruit and Vegetable Convention this year, the State Horticultural Association of Pennsylvania (SHAP) asked researchers to display posters so everyone can see the results of grower-funded research. I have spent my professional career in the mid-Atlantic region, but only the last 9 years in Pennsylvania. As a pomologist at two other universities, I was envious of the political and financial support that Penn State faculty and county educators received from SHAP. Over the past couple of decades the financial support did not keep up with inflation, so SHAP recently made a commitment to raise \$250,000 per year for research and extension. The PVGA, Potato Growers, and Christmas Tree Growers also provide funding for research and extension. I would like to explain why this support is so important and what will happen without it.

The five sources of funding for colleges of agriculture at Land Grant Universities include federal, state, and county appropriates, as well as tuition and grants and contracts. Over the past 40 years, federal and state funding has not kept pace with inflation and has often been cut. However, tuition and county funding have increased. In some states, county funding has not increased, and extension has all but disappeared in those states. The other source of funding that has increased is grants and contracts, which now account for about one-third of our college's budget. In the 9 years I have been at Penn State, some years we got budget increases, sometimes decreases, and sometimes we were level funded. The sum of the cuts is more than double the sum of the increases. Level-funding is better than being cut, but during years of level funding the college's spending power is reduced by more than \$1 million due to increases in salaries and benefits. The college's budget from the state for 2013 was actually the same as it was in 1999 without adjusting for inflation. More than 90% of the college's budget is now in salaries, leaving very little money for operations. The budget cuts have resulted in fewer county educator and staff positions. Faculty positions have declined because the college has found other sources of funds to pay some of the salaries, but the types of faculty positions that have been added to the college have drastically changed the College. Many of these positions are co-hires with institutes within the university. Institutes hire faculty with expertise to compete for large grants, and most of these grants involve basic research. The institutes are not very interested in hiring faculty to teach or do extension.

Another factor influencing hiring decisions is whether there is enough potential funding to support a productive research program. In the 1980s, the college provided me with a technician, a graduate student most years, \$7,000 in annual operating funds, and the department paid for my travel to national meetings and paid page charges when I published in scientific journals (page charges amounted to about \$1,200 per year). New faculty members today receive a startup package, often including a half-time technician for 3 years, 5 years of graduate-student support, some equipment, and some operating funds for three years. After three years they can expect to receive about \$1,500 in operating funds from the department. After three years, they are expected to obtain external funding for a technician, graduate students, supplies, travel, page charges, and normal operations. If they are unable to obtain adequate funding, then they will not be able to develop the kind of research program that is expected to get tenure. Therefore, department heads and deans are reluctant to hire faculty members into positions where they will likely fail due to inadequate

funding.

Last fall I participated in a fruit grower's meeting in Idaho and learned about a strong partnership between the University of Idaho and Idaho's agricultural industries. Due to budget cuts in 2009, the Dean planned to close three research centers including the Parma Research & Extension Center where fruit research is performed. Operations at one center were suspended. The activities at a second center have been scaled back, but the center is still operating because the barley, wheat, and potato commissions provided financial support. The Parma Research & Extension Center is still operating at full capacity because Simplot, a Boise-based agriculture business, the Treasure Valley Agricultural Coalition, and the Idaho Fruit Growers are contributing \$400,000 a year for five years.

Another example of collaboration between industry and a university is the recent investment by fruit growers in Washington. Washington tree fruit growers pay assessments to the Washington Tree Fruit Research Commission and the growers passed a special assessment to raise \$27 million to endow six faculty positions, five extension educator positions, and operating funds for the two fruit research centers. Since these positions are endowed, they are permanent regardless of the university's funding situation.

The reason I went through all of this is to emphasize that industry support not only allows researchers and extension personnel to solve industry problems, but industry funding is becoming a requirement for hiring applied researchers and extension workers. We recently hired a viticulturist because the wine grape industry offered to cover part of the salary. This is essentially a co-hire, but we partnered with industry rather than an institute to hire an applied researcher. In the past 30 years we have lost about two-thirds of the pomologists in the U.S. and we have probably lost a similar number of vegetable researchers. The only states with substantial fruit and vegetable programs are those with industries large enough to provide financial and political support for those programs. As public funding for higher education and research continue to decline, the horticultural industries will be expected to increase their financial support. Many of the applied researchers and extension personnel in the Plant Science, Entomology, and Plant Pathology Departments can retire in the next 6 or 7 years. Many of these positions will not be replaced, but some will be replaced if there is adequate industry support. Research and education is an investment in the future. I commend SHAP for investing in the future of the fruit industry and I hope that other commodity groups will follow their lead.

Dr. Marini is head of the Plant Science Department at Penn State Univ. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension,
<http://extension.psu.edu/plants/vegetable-fruit/news/2014/>,
February 28, 2014.



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NEWS

National News Briefs

Farm Bureau Renews the Fight for Immigration Reform

Farm Bureau and other agriculture organizations recently hosted a briefing on Capitol Hill to outline farmers need for immigration reform.

The session was organized by the Agriculture Workforce Coalition, of which the American Farm Bureau Federation and United Fresh Produce Association are affiliated, is part of a renewed effort to see immigration reform enacted by Congress this year.

Efforts to establish a new system for agriculture labor enjoyed some success last year in Congress with the Senate adopting a comprehensive reform package but the effort stalled in the House.

Recently, the World Agriculture Economic and Environmental Services released a report on the potential impact to food prices if immigration reform focuses solely on enforcement. Food prices would increase by 5 to 6 percent over the next five years, and production would decline by roughly \$60 billion, if that scenario was to play out.

The study, called "Gauging the Farm Sector's Sensitivity to Immigration Reform," was commissioned by AFBF and done in conjunction with the *#farmimmigration* grassroots campaign, which seeks to promote immigration reform. Instead of focusing exclusively on enforcement, Farm Bureau is encouraging Congress to embrace a comprehensive plan that includes a redesigned guest worker program and the chance for skilled agriculture employees to earn an adjustment of status.

"Status quo is not a viable option for anyone involved in this issue, and as a nation, we expect better," said AFBF President Bob Stallman. "Farmers and ranchers recognize there are costs to ensuring they have a legal, stable workforce. And we are willing to step up to the plate."

Fruit and vegetable production stands to suffer the greatest risk under an enforcement-only scenario.

"Over five years, an enforcement-only approach would lead to losses in farm income large enough to trigger large scale restructuring of the sector, higher food prices, and greater dependence on imported products," Stallman said.

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

Farm Bureau Lays Out Federal Tax Priorities to Senate

Farm Bureau is calling on lawmakers to continue the unrestricted use of cash accounting for farmers who pay taxes as individuals.

Farm Bureau recently submitted comments to the Senate Finance Committee on a discussion draft of possible tax reforms. Because agriculture requires large capital investments for machinery and other depreciable assets, farmers place great value on provisions such as Section 179, which allows farmers to write off capital expenditures in the year that purchases are made. That helps farmers better manage cash flow.

"The ability to immediately expense capital purchases also provides an incentive for farmers and ranchers to invest in their businesses and offers the benefits of reducing the record keeping burden associated with the depreciation," Farm Bureau wrote.

Farm Bureau is also asking Congress to maintain the annual expensing of preproduction expenditures, including deducting

fertilizers and soil conditioners. Farmers can currently use tax deductions for the cost of fertilizer, lime and other soil amendments. Farm Bureau also believes farmers should be able to expense soil and water conservation efforts.

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

Missouri Considers Reimbursing Food Stamp Recipients for Purchasing Fruits and Vegetables

A Missouri House panel heard testimony earlier this week on a bill, HB 1879, that would create a pilot program to give food stamp recipients \$10 per week in bonus dollars to purchase fruits and vegetables at farmers' markets. Supporters of the bill explained that the legislation would reduce obesity in low-income households, thereby reducing healthcare costs for obesity-related illnesses.

"Around the country many states now have pilot programs that provide financial incentives to food stamp recipients to purchase more fresh fruits and vegetables at farmers' markets," said Lorelei DiSogra, United vice president of nutrition and health. "Strengthening nutrition in SNAP (food stamp program) is a high priority for United Fresh, the 2014 Farm Bill provides \$100 million for Nutrition Incentive Grants to increase fresh fruit and vegetable purchases among low-income consumers participating in SNAP."

From Inside United Fresh, United Fresh Produce Association, February 27, 2014.

Communication Key in Building Consumer Trust

Many consumers' knowledge of agriculture comes from what they see driving by a farm, or picking up fresh produce at a farmers market.

So it's incumbent on farmers to reach out of their comfort zone and interact with people about the job they do to raise food. Besides telling their story, farmers also need to listen to consumer concerns. That was the consensus from a panelist of communicators and marketing specialists with state Farm Bureaus during a session held at the American Farm Bureau Federation annual convention in San Antonio.

Research among consumers has consistently showed that they appreciate farmers, but do not understand their jobs, creating a "trust gap," said Judy Rupnow, with Morgan Myers, a strategic communications firm.

"Along the way, we forgot to tell the public what we were doing," Rupnow said. "This created a trust gap but that's changing."

Several state Farm Bureaus are taking approaches to help bridge that gap. Ohio Farm Bureau created the "Grow and Know" program. The program hosts on farm events, meals and tours to educate the public. They also do special activities with hands-on learning, cooking and food canning at fairs, farm markets and even charity events.

Ohio Farm Bureau partners with local businesses to finance and promote activities along with utilizing media and social media. The program is also touted as a benefit for associate members of Ohio Farm Bureau.

"First moms, the public, need to know us, like us and then trust us," said Rita Hechmer, marketing specialist for Ohio Farm Bureau. "It has to be in this order."

From Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, March 2014.
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NEWS

National News Briefs (*continued from page 4*)

Clean Water Act Proposal Needs Farmer Input

American Farm Bureau Federation is encouraging its growers to contact their representatives as the Environmental Protection Agency seeks to expand its jurisdiction under the Clean Water Act.

The proposed rules, which are not yet open to public comment, would give the EPA authority under the Clean Water Act to virtually every water body in the United States. That would also include ditches and farm fields that carry runoff during rain and flooding events. During a workshop held at the 95th AFBF annual convention, farmers were encouraged to contact their Congressional representatives and talk about how these new regulations would impact their farm.

"Grassroots action on this issue is going to be hugely important," said Don Parrish, AFBF's senior director of regulatory relations. "Help them understand that this issue is important to you."

The Clean Water Act began in 1972 as an attempt to reduce water pollution in the nation's navigable rivers and streams. The act helped curtail the practices of discharging raw pollutants into waterways and established regulatory programs that required permits limiting the volume of pollutants. Since then, the EPA and the Army Corps of Engineers have made several attempts to expand the scope of the program, including the definition of "navigable waters," to include wetlands, ditches and temporary water features created by seasonal flooding.

State News Briefs

Local Foods Have Economic Impact

Farms that sell their products locally can boost economic activity in their communities, according to a Penn State study.

"There has been a lot of hope, but little evidence, that local food systems can be an engine of economic growth in communities," said Stephan Goetz, a professor of agriculture economics at Penn State. "Our findings show that, at least in certain regions of the country, community-focused agriculture has had a measurable effect on economic growth."

Goetz focused his work on looking at the impacts of community-focused agriculture on local economic growth, rather than simply examining agriculture sales. In the Mid-Atlantic region, which includes Pennsylvania, a \$1 increase in the level of direct farm sales resulted in a \$9 increase in overall farm sales.

"We found that for every \$1 increase in agricultural sales, personal income rose by 22 cents over the course of five years," said Goetz. "Considering the relatively small size of just the farming sector within the national economy, with less than 2 percent of the workforce engaged in farming, it's impressive that these sales actually move income growth in this way."

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

Farm Bureau Files Food Safety Comments for Imported Foods

Pennsylvania Farm Bureau is calling on the Federal Drug Administration to hold imported foods to the same safety standards as domestic produce under proposed food safety guidelines.

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The new proposed rules will attempt to expand the EPA authority to many of those water features and will not create an exemption for many normal farm practices, said Virginia Albrecht, an environmental and natural resources attorney. Albrecht said she expects the proposed rules will soon be open for a 60-day comment period. Once the rules are open for public comments, it will be crucial for a record number of farmers to submit comments, Albrecht said.

From the Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, February 2014.

Directors Hold... (*continued from page 2*)

At their regular meeting on March 4, the Board reviewed the attendance and financial reports from the 2014 Mid-Atlantic Fruit and Vegetable Convention. The vegetable registration was the third highest on record and there is expected to be about \$40,000 in surplus revenue after the profits from the trade show are received.

The Board also voted to renew the contract with Troxell Administrative Services for another year to manage the day-to-day operations of the Association for an annual fee of \$60,000 – an increase of 1.7%. William Troxell serves as the Executive Secretary for the Association working as an independent contractor. The fee covers both his work and that of his wife, Cheryl, and employees. Troxell Administrative Services also provides the office space, office equipment, storage space, and basic office supplies for the fee besides covering the necessary self-employment taxes, health insurance and most staff travel expenses.

The Directors also reviewed the current financial reports, plans for this summer's regional Field Days and the transportation assistance program for auction growers to attend the Convention. They also agreed to take a more active role in the management of the Farm Show food booth.

Director Jeffrey Stoltzfus will be coordinating the Association's response to the Food and Drug Administration's revisions to its Food Safety Modernization Act rules which are expected to be published this summer.

At their March 25 meeting the Board not only worked on the strategic planning workplan, but also voted (in a subsequent email ballot since a quorum was not present at the meeting) to apply for a Specialty Crop Block Grant to hire or contract with a Business Development Director and administrative assistant to enable the Association to provide more and better services to the members. Further details on this proposal will be worked out when and if the grant is received.

Judy Chambers and William Shuffstall, the Penn State Extension educators who facilitated the Vegetable Industry Strategic Planning Initiative, will be developing a comprehensive report on the Initiative after their meeting with the Board in a conference call in late April or early May. That information will be reported in the newsletter in the coming months.

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NEWS

State News Briefs (*continued from page 6*)

Pennsylvania Farm Bureau and the American Farm Bureau Federation filed comments with the FDA encouraging the agency to hold a second comment period on the rules for imported food, due to the scope and complexity of the proposal. Additionally Pennsylvania Farm Bureau asked the FDA to maintain the same standards and exemptions for domestic and imported produce.

More than half of the fresh fruits eaten in the United States are grown outside of the country. Food is imported from more than 150 countries and through more than 300 ports.

The FDA has proposed making a regulatory exemption for growers with farm sales of \$25,000 or less per year. Few domestic growers would qualify for these exemptions, but that threshold would be vastly different for foreign farmers, PFB said in comments.

For instance, China leads the world in apple production, but most farmers there make less than \$25,000 a year, Farm Bureau said. Under the small farm exemption, the vast majority of apples imported from China would be exempt from food safety rules.

"That puts United States producers at a significant competitive disadvantage in their own domestic markets, creating widely divergent and unpredictable levels of food safety regulation for United States consumers," Farm Bureau said.

If food safety rules are not applied similarly to both domestic and imported foods, those regulations could constitute a trade barrier that would be open to a World Trade Organization challenge, PFB said. It is also critical that FDA must have adequate resources to implement new regulations, along with sufficient personnel to inspect imported food.

"Without robust enforcement, the content of the food safety rules for imported produce are meaningless from a food safety perspective," PFB said.

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

Innovative Agricultural Concept Raises Crops on a Vertical Farm

A new concept to raise horticultural crops in a vertical setting is being planned for Northeast Pennsylvania.

Green Spirit Farms LLC from Michigan has commercialized the concept of vertical farming that will produce leafy greens, peppers and tomatoes in an existing 300,000 square foot building located in Scranton.

Instead of growing crops in the ground, the vertical system utilizes industrial racks which accommodate four or five levels of vegetable crops planted in a particular horticultural growing medium in place of soil. Specialized artificial lighting is used to provide light to the crops.

Vertical farms are generally located in or near urban areas and are beginning to be implemented around the world. The produce will be grown throughout the year using less water

and energy than traditional greenhouses or hydroponic systems.

From the Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, February 2014.

Producers Share Their Best Management Practices at Farm Show Meeting

Thanks to advances in crop management and equipment, farmers in Pennsylvania are making a measureable impact on water quality and the environment.

That improvement is driven by farmers' desire to improve soil health and reduce run-off—not by government mandates. That was the assessment that George Greig, secretary of the Pennsylvania Department of Agriculture, gave during a summit hosted by PDA and the Pennsylvania Department of Environmental Protection. The summit, held during the Pennsylvania Farm Show, showcased three PFB members and the methods they used to reduce environmental impacts on their operations.

"We did it voluntarily," Greig said. "There needs to be a balance. We have to make sure that we don't discourage our farmers."

Christopher Abruzzo, DEP secretary, said he wants to make sure that Pennsylvania farmers are properly recognized for the work they do and that they share their stories with others.

"Our agriculture community is the best environmental steward," he said. "We need to highlight these really good practices and share them with others."

With that in mind, PDA and DEP officials invited conservation groups to attend the Farm Show summit and have farmers share their production practices.

Jim Brubaker, a Union County grain and livestock farmer who serves on PFB's State Board of Directors, said his farm began to transition to no-till planting and cover crops in the late 1990s. The result has been a noticeable increase in soil retention and fertility.

"Our primary goal is to keep nutrients where they are in the soil," he said.

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NEWS

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Alvin Shaffer, who farms more than 2,600 acres in Northumberland County, has found similar improvements through cover crops and no-till planting. However, some of the conservation practices utilized 20 or 30 years ago are becoming outdated through these new cropping systems, Shaffer said. For instance grass waterways were necessary when tillage was common, but now some of them are getting clogged with corn stubble, creating new runoff during heavy rains, he said. Shaffer also reiterated the need to educate farmers on conservation practices, rather than trying to force compliance through regulations.

Ron Kopp, who operates a dairy farm in Dauphin County, said partners like Penn State Cooperative Extension play a key role in helping farmers adopt new practices. Over the years, the farm has adopted contour planting, cover crops and no-till planting to reduce soil loss.

"It is about educating the farmers," he said. "We do what we do because we want to be financially viable and environmentally viable."

*From the Penna. Agricultural Alliance Issues Update,
Penna. Farm Bureau, February 2014.*

Glenn "GT" Thompson Wins Golden Plow Award

Congressman Glenn "GT" Thompson has received the "Golden Plow" Award, the highest distinction Farm Bureau bestows on a member of Congress.

Thompson, a Republican from Centre County, has become a staunch advocate for agriculture during his tenure with Congress. Thompson, who represents Pennsylvania's 5th

Congressional district, received his award during Pennsylvania Farm Bureau's National Legislative Conference in Washington D.C.

The Golden Plow, given by the American Farm Bureau Federation, recognizes up to two members of Congress who show broad support for Farm Bureau and agriculture through their votes and interactions with members. Thompson, who was nominated by Pennsylvania Farm Bureau, was the sole recipient of this year's award.

"Congressman Thompson has been a strong and consistent supporter of Pennsylvania agriculture. From his first day in office, he has demonstrated a keen interest in issues impacting agriculture and rural communities," said PFB President Carl T. Shaffer. "GT continually tours Pennsylvania farms and sits down with farm families to hear about their concerns and dreams. He then takes that knowledge back to Washington in order to protect farmers from onerous regulations and champions legislative efforts to help agriculture and rural areas prosper."

Thompson, who serves on the House Agriculture Committee, played a key role in securing a new Farm Bill, serving on a conference committee that hammered out differences between the House and Senate versions. As chair of the Subcommittee on Conservation, Energy & Forestry, Thompson ensured the state's forest products industry was represented in the 2014 Farm Bill. Thompson has co-sponsored legislation to alter how education dollars are allocated to schools so that more populous districts are not given an advantage, and also a

(continued on page 10)

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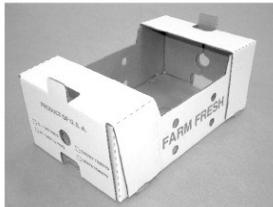
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NEWS

State News Briefs (*continued from page 9*)

bill that clarifies rules farmers need to follow with pesticide permits.

Thompson said he was honored to receive the award, and thanked Farm Bureau members for their continued support and interaction.

"It has been a distinct privilege to work on behalf of our family farms to promote a robust agricultural sector, which is fundamentally important to Pennsylvania and the economic well-being of the country," he said. "I greatly appreciate this recognition and also want to thank the American Farm Bureau and the Pennsylvania Farm Bureau for their advocacy on behalf of agriculture."

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

Penn State Hires New President

Dr. Eric J. Barron has been selected as the 18th president of Penn State by the university's Board of Trustees.

Barron currently serves as president of Florida State University. He will start his Penn State post on March 12.

Barron replaces Rodney Erickson as university president. Barron is no stranger to Penn State. He served as dean of the college's Earth and Mineral Sciences department from 2002 to 2006, and was a member of the college's faculty starting in 1986.

"My wife, Molly, and I spent 20 years at Penn State, where I served as a faculty member, center director and dean. In that time, I learned what it meant to continually strive for excellence – to make every year stronger than the year before," Barron said. "I also came to understand the power of this community, we are unbeatable when we are working together for a common purpose. It is an honor to lead this great university."

Board of Trustees Chairman Keith Masser said Barron has an exceptional track record, and has the knowledge and expertise to lead Penn State forward.

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

Pennsylvania Pesticide Applicators Actively Engaged in Pesticide Container Recycling

Under the Pennsylvania Department of Agriculture's Plastic Pesticide Recycling Program, public and private pesticide applicators have been able to safely dispose of a high number of high density polyethylene plastic containers.

Seven regions have been designated throughout the State to provide locations where empty containers may be delivered. Beside pesticides, the containers may also have been used for crop oils, surfactants and fertilizers. The containers must first be free of all product residue inside and outside by rinsing three times or using the pressurized rinsing method.

The plastic will be converted into chips and made into fence posts, pallets, marine pilings, field drain tiles and recycled for other uses. Agricultural producers and agribusinesses have been committed to the Plastic Pesticide Recycling Program which is now entering its

twentieth year and has recycled more than 1.84 million pounds of plastic.

From the Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, February 2014.

Registration Now Open for National Ag in the Classroom

Pennsylvania will put agriculture on display during the National Ag in the Classroom Conference, which will be held June 23-27 in Hershey. Registration for the conference is now open.

Pennsylvania has been selected to host the national conference, which is expected to draw several hundred educators from across the country. Pennsylvania's statewide Ag in the Classroom, normally held in State College, will be held in conjunction with the Hershey event.

Pennsylvania teachers will be eligible for continuing education credits. They can also apply to the Pennsylvania Friends of Agriculture Foundation for sponsorship money.

The National Ag in the Classroom conference will feature a number of workshops and tours that highlight the diversity of Pennsylvania agriculture.

If you know of an educator who would be interested in attending, encourage them to visit: www.pafbfriends.org and www.agclassroom.org/conference2014.

From the Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, February 2014.



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NEWS

USDA Enhances Farm Storage Facility Loan Program

The U.S. Department of Agriculture (USDA) today announced the expansion of the Farm Storage and Facility Loan program, which provides low-interest financing to producers. The enhanced program includes 22 new categories of eligible equipment for fruit and vegetable producers, and makes it easier for farmers and ranchers around the country to finance the equipment they need to grow and expand.

This is part of a broader effort to help small and mid-sized farmers and ranchers, as announced today by Agriculture Secretary Tom Vilsack.

Producers with small and mid-sized operations, and specialty crop fruit and vegetable growers, now have access to needed capital for a variety of supplies including sorting bins, wash stations and other food safety-related equipment. A new more flexible alternative is also provided for determining storage needs for fruit and vegetable producers, and waivers are available on a case-by-case basis for disaster assistance or insurance coverage if available products are not relevant or feasible for a particular producer.

Additionally, Farm Storage and Facility Loans security requirements have been eased for loans between \$50,000 and \$100,000. Previously, all loans in excess of \$50,000 required a promissory note and additional security, such as a lien on real estate. Now loans up to \$100,000 can be secured by only a promissory note.

"The Farm Storage and Facility Loan program has helped American farmers and ranchers to finance on-farm storage for almost 13 years," said Farm Service Agency Administrator (FSA), Juan M. Garcia. "We anticipate these changes will

increase the number of individuals who qualify for these loans and help them access new market opportunities."

The low-interest funds can be used to build or upgrade permanent facilities to store commodities. Eligible commodities include grains, oilseeds, peanuts, pulse crops, hay, honey, renewable biomass commodities, fruits and vegetables. Qualified facilities include grain bins, hay barns and cold storage facilities for fruits and vegetables.

Visit www.fsa.usda.gov or an FSA county office to learn more about FSA programs and loans, including the Farm Storage Facility Loan Program

*From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension,
<http://extension.psu.edu/plants/vegetable-fruit/news/2014>,
March 20, 2014.*



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MARKETING

How's the Competition Doing?

John Berry

U.S. consumers have benefited from an increasing volume and variety of fresh produce at both retail and food service outlets. There has been a significant accompanying growth in imports, particularly since the 1990s. The produce section in today's grocery store often has dozens, if not hundreds, of different fresh fruits and vegetables on display all year around. These products typically come from all corners of the globe as additions to our domestic fresh fruit and vegetables. Improved logistics, technology, and transportation have allowed this increase in availability.

Did you know, nearly two-thirds of our fresh produce imports come from Mexico, Chile, and Costa Rica. Additionally, California, taking advantage of its diverse geography and climate, is the nation's largest fresh-market producer. The State is the nation's leading producer of fresh-market grapes, strawberries, peaches, and a major producer of a wide variety of fresh vegetables and greens.

What does all this have to do with me as a local produce farmer? As we develop a growing and marketing plan for 2014 – we may wonder how the upcoming season will treat us compared to previous years. Could there be any impact from this produce typically coming from outside our local area?

A recent Wall Street Journal article noted that, "Record-low precipitation in 2013 has worsened California's drought, draining reservoirs, forcing farmers to keep fallow thousands of acres of fields, and leaving some ski resorts high and dry during the busy holiday season. Urban and agricultural customers, including Southern California's huge Metropolitan Water District, have been told by the state to expect to receive this year, on average, just 5% of the water they historically request, after a year in which rainfall totals hit record lows in many parts of the state. Last year, customers received 35% of requested supply, on average." Additionally, checking NOAA drought monitor data we see most of Mexico and much of South America are currently rated at "dry" or "drought" status also.

As our customers expand concern for healthful foods and build increased awareness of local farm-food sources we may expect another strong demand year in 2014. Local distribution is also seeing some growth. Not only are there examples of local food distribution systems starting to mature, the many established food brokers are carrying more and more local pro-

duce as their conventional customers demand.

Of course, no one can predict the future – but - if growing conditions in the southeast U.S. and South America are not ideal, perhaps east coast growers will be able to fill more of the expanded regional demand for fresh produce in 2014? Will we be prepared?

Mr. Berry is with Penn State Extension. This article includes information from: FTS-356-01; Economic Research Service/USDA. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2014>, January 31, 2014.

Producers Can Market Local Products to Turnpikers

Farmers who want to sell their locally-grown products at farmers markets along the state's busiest highway can apply to be part of the Pennsylvania Turnpike Plaza Farmers Market program.

The Pennsylvania Department of Agriculture and Pennsylvania Turnpike Commission organize farm markets at the Allentown Service Plaza in Lehigh County, Sideling Hill Service Plaza in Fulton County and New Stanton Service Plaza in Westmoreland County. Markets are open from April 1 through Nov. 30.

"Our turnpike farmers markets help encourage travelers to eat fresh, healthy snacks while they're on the road," said Agriculture Secretary George Greig. "Producers can take advantage of this unique opportunity to give the 526,000 daily turnpike drivers a taste of our state's agriculture industry without leaving the toll-road."

Markets open at 10 a.m. on Saturdays, Mondays and holiday weekends, and at 11 a.m. on Fridays and Sundays. They close at dusk.

At least half of gross sales must be products grown or produced in Pennsylvania. Value-added items like canned goods, candles, soaps, preserves and baked pies may not exceed 25 percent of sales.

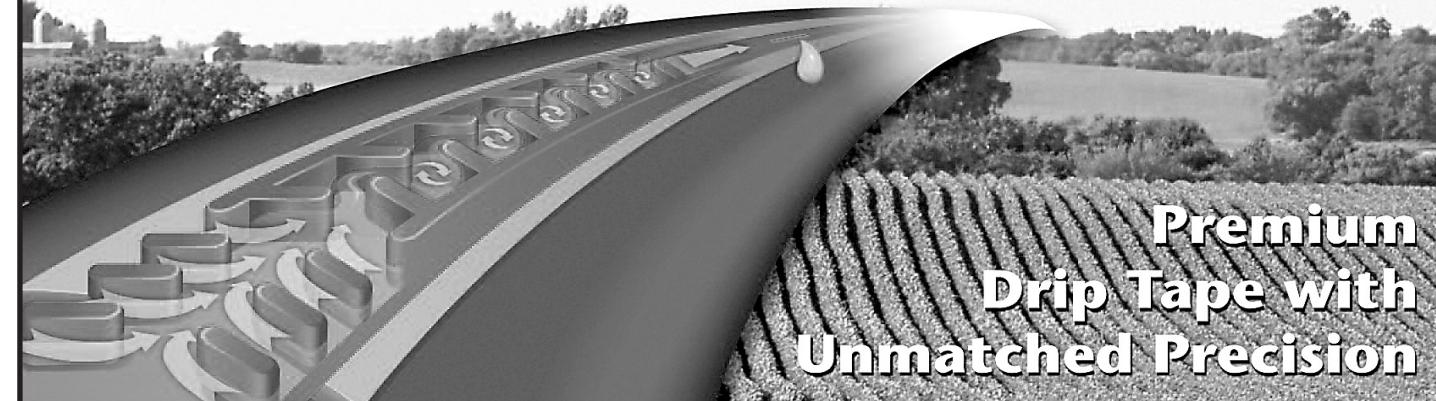
Farmers who want to sell products at the service plaza farmers markets should contact Samantha Snyder at samasnyder@pa.gov or call 717-787-1429.

For more information, visit www.agriculture.state.pa.us and search "turnpike."



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MARKETING

Marketing News Briefs

Learn How to Effectively File PACA Complaints

The USDA Agricultural Marketing Service is hosting a free, interactive webinar, *An Overview of the PACA Compliant Process*, on Wednesday, April 30, 2014 at 2:00 p.m. Eastern Time. The webinar will feature John Koller, Chief of the Dispute Resolution Branch of the Perishable Agricultural Commodities Act (PACA) Division. Koller will provide a brief overview of the Act, discuss the importance of Federal inspections, and explore how to file informal and formal PACA complaints. Following the presentation, there will be a question and answer period.

To register online for the USDA webinar go to <http://bit.ly/LypyRg>. This webinar is part of a series of webinars sponsored by the Agricultural Marketing Service's Fruit and Vegetable Programs. If you miss a webinar, you can visit USDA's Webinar Archive to watch it online.

From Inside United Fresh, United Fresh Produce Association, February 27, 2014.

WIC Improvements Mean More Fruits and Vegetables for Young Children

United Fresh applauds USDA's commitment to increasing fruit and vegetable consumption among low-income pregnant and breastfeeding women, and their infants and young children who participate in the Women, Infants, and Children (WIC) program. Last Friday, USDA published the *Final Rule on the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC): Revisions to the WIC Food Package*.

The rule increases the cash-value of the fruit and vegetable vouchers for children to \$8 per month; allows WIC mothers to

receive a voucher for fresh fruits and vegetables instead of jarred baby foods for their older infants; and allows WIC mothers to add cash (split tender) at check out to their fruit and vegetable vouchers to maximize their purchases.

"All of these provisions will increase fruit and vegetable consumption among WIC mothers and their young children," said United President & CEO Tom Stenzel. "Our only disappointment is that we continue to believe that WIC vouchers should include all fresh fruits and vegetables, without added fats, sugar or sodium, including fresh white potatoes."

For more than a decade, United Fresh has been a leading advocate for including fruits and vegetables in the WIC food packages. United played a leadership role in urging USDA and Congress to update WIC food packages to include fruits and vegetables, and has worked with the National WIC Association and advocates to increase the value of the fruit and vegetable vouchers for mothers and children.

The CDC has recently recognized the important role that the WIC Program's nutrition education and food package changes that added healthy items like fruits and vegetables has played in decreasing childhood obesity by 43 percent among 2-5 year olds.

From Inside United Fresh, United Fresh Produce Association, March 6, 2014.

Healthier School Lunches Increase Vegetable and Fruit Consumption

A Harvard study published this week shows that healthier school lunch standards result in student's selecting and con-



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MARKETING

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suming more fruits and vegetables and that healthier nutrition standards have not increased plate waste. This study, conducted by the Harvard School of Public Health is the first to examine the implications of the new school meal nutrition standards on student selection, consumption and plate waste.

"This study provides evidence that the new school lunch standards are improving student's eating habits and that students are eating more fruits and vegetables," said Dr. Lorelei DiSogra, United vice president of nutrition and health. "United Fresh supports the new school lunch and breakfast standards which significantly increase the amount and variety of fruits and vegetables served every day. Schools nationwide are improving the healthfulness of school meals and working to create healthier school food environments. As this study points out, legislation to weaken the new nutrition standards is not warranted."

USDA's new nutrition standards for the National School Lunch went into effect at the beginning of school-year 2012-13. The study, published in the *American Journal of Preventive Medicine*, examined student eating behavior in four low-income urban schools in Massachusetts before and after the new USDA guidelines went into effect.

From Inside United Fresh, United Fresh Produce Association, March 6, 2014.

Fresh Facts Year in Review Shows Fresh Produce Sales Up in 2013

United Fresh released the 2013 Year in Review edition of the *FreshFacts® on Retail* report, which examines overall retail trends in produce for the past year. The report shows that during 2013, the produce department averaged more than \$47,000 per week per store, which was up 4.8 percent over the previous year.

The *FreshFacts® on Retail Report*, produced in partnership with the Nielsen Perishables Group and sponsored by Del Monte Fresh Produce, measures retail price and sales trends for the top 10 fruit and vegetable commodities, as well as value-added, organic and other produce categories.

Highlights of this "Year in Review" report include:

Over the past year, all of the top 10 fruits posted volume increases

Fruits' average weekly dollar sales increased 4.5 percent versus 2012

All of the top 10 vegetables posted increases in weekly dollar sales

Among value-added fruit categories, value-added fruit and fresh-cut fruit both posted increases in weekly dollar sales

Snacking value-added vegetables posted an increase of 15 percent in weekly dollar sales

Avocados posted the highest growth in the fruit category, with dollar sales increasing 11.7 percent and volume increasing 10.3 percent

Packaged salad and tomatoes, the two top-selling vegetable categories in 2013, increased dollar sales 6.7 percent and 3.4 percent

This quarters' *FreshFacts®* report also features a spotlight on organic produce. Recent trends show that even with increases in retail prices, volume sales continue to grow in all organic fruit and vegetable categories. The

growing demand for organic produce resulted in dollar and volume increase, roughly 20 percent for both organic fruits and vegetables overall.

To obtain the complete *FreshFacts® on Retail Report* contact PVGA.

From Inside United Fresh, United Fresh Produce Association, March 13, 2014.

Foodservice Report Cites Menu Trends that Incorporate Fruits and Vegetables

Restaurant innovations using blueberries, green tomatoes and watercress are just some of the highlights of the Spring 2014 edition of *Fresh Insights for Foodservice*, a quarterly report from United Fresh showcasing the latest trends in fresh produce use in foodservice. The report, launched in January 2014, is an insightful tool for identifying trends in foodservice.

The Spring *Fresh Insights* also reports on the increased incorporation of fruit and vegetable smoothies in restaurant menus, with acai and avocado among the trending ingredients. Mixing smoothies with "a variety of fruits and, increasingly, vegetables, fits well within the growing trend of 'healthy yet indulgent,'" according to the report.

The Spring report of *Fresh Insights* also includes a look at the top fresh produce ingredients used by restaurants for making flatbreads. Plus, readers will find news about fresh produce used in pizza served by fast casual restaurants, and a survey of how fresh produce is being used in limited time offerings at a variety of prominent restaurant chains.

"Using the research gathered from restaurants from across the country, the *Fresh Insights* report tells the ways fresh fruits and vegetables are increasingly used in dishes in every restaurant segment," said United's Vice President of Trade Relations Jeff Oberman, liaison to United's Retail-Foodservice Board. "Because foodservice trends are constantly evolving, our members can use the report to help them take advantage of these restaurant menu trends."

(continued on page 16)

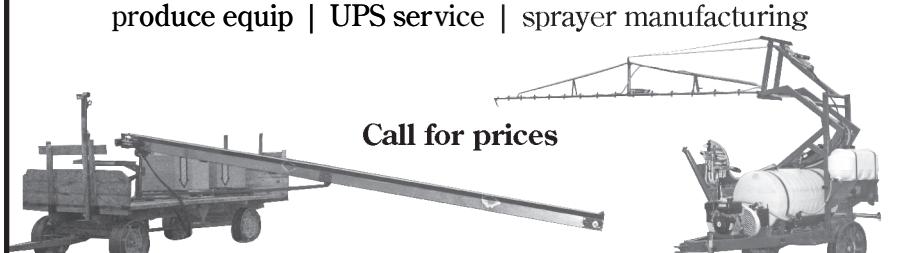
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VEGETABLE PRODUCTION

Growing the Best Vegetables and Small Fruit: Getting the pH right

Steven Bogash

As we look around at ways to improve produce production, one area that offers the greatest return in both fruit quality and decreased fertilizer inputs is in getting the pH of your irrigation solution correct. Every crop has an ideal pH range where it removes nutrients from the soil solution optimally. Getting your soil and water pH right can be the difference between a profitable crop and high field / packing house losses.

As we look around at ways to improve produce production, one area that offers the greatest return in both fruit quality and decreased fertilizer inputs is in getting the pH of your irrigation solution correct. Every crop has an ideal pH range where it removes nutrients from the soil solution optimally. Getting your soil and water pH right can be the difference between a profitable crop and high field / packing house losses.

Since pH is a logarithmic scale, even seemingly minor adjustments in the pH of a solution can have a major impact on nutrient uptake. Note: 1 point on the scale is a ten-fold change, so a pH of 7 is ten times more alkaline than a pH of 6. A pH of 5 is 100 times more acidic than a pH of 7 (10×10). A pH of 4 is 1,000 times more acidic than a pH of 7 ($10 \times 10 \times 10$) and so on. Since tomatoes are the number one dollar per acre crop in PA and much of my research goes into tomato nutrition, that crop will be our example for this article.

Tomatoes (peppers and eggplant too) prefer a pH in their soil solution of 6.2-6.5. That range provides the optimum uptake of nutrients, so whatever nutrients you provide are likely to be used by healthy plants. As the soil solution pH moves above that range, it becomes increasingly difficult for tomatoes to extract potassium even if plenty is present. Yellow Shoulders, Gray Wall, Internal White Core... are all nutrient driven disorders that result from insufficient potassium at fruit set. Once fruit set with insufficient potassium, no amount applied later will fix the fruit. In addition, Blossom End Rot and Cracking, while largely Ca/Mg disorders are part of this picture as getting the nutrients calcium, magnesium and potassium all in the correct proportions into tomatoes reduces or eliminates virtually all common nutrient disorders. A grower cannot get the proportions of these nutrients correct without first addressing the pH of the soil solution. Growers have been able to reduce potassium applications substantially and still get improved packouts by simply getting their irrigation water and fertigation solution pH to 6.2-6.5.

Throughout much of Pennsylvania and the Mid-Atlantic, our well, spring, and surface waters source from limestone-based aquifers. These waters typically have high pH and alkalinity which for the purpose of growing the best tomatoes is any pH above 6.5. pH is the relative acidity or alkalinity where 7 is considered neutral and anything below that is acid and above that is alkaline. Alkalinity is measured as bicarbonate (typically CaCO_3) and is most easily understood as the resistance to changing the pH of a solution. That is, it takes very little acid to neutralize a solution with a pH of 7.8 (relatively alkaline) and an alkalinity of 120 ppm CaCO_3 where it would take a lot more acid to neutralize a solution with a pH of 7.5 and an alkalinity of 350 ppm CaCO_3 . The greater the alkalinity value, the more acid needed to neutralize the solution. Alkalinity and pH are related, but are not the same.

Before a prescription for acid application can be created, your water supply needs to be tested for both pH and alkalinity. Always specify to your laboratory that you need the alkalinity value in 'ppm bicarbonate' as many labs are also testing home

water for the calibration of water softeners where grains per gallon is the measurement.

If you are an organic grower, then you will probably be using powdered citric acid to reduce the pH of your irrigation water. It takes approximately 9 ounces of powdered citric acid per 100 gallons of water to reduce most well water by one point on the pH scale. Tom McCarty, Retired Extension Water Quality Educator, and I did extensive experiments with well water collected from sites all over Central PA and found that this formula worked most of the time. Use a two-point calibrated pH meter to refine any acid application. Concentrated vinegar is also allowed under organic standards, but that is probably substantially more expensive and harder to handle due to the weight in handling so much liquid than powdered citric acid.

Most conventional growers use either 35% or 93% sulfuric acid for pH reduction. The 93% is readily available from greenhouse suppliers in one gallon jugs and was available from chemical suppliers in carboys and totes, but due to illegal drug operations using it as an ingredient, it has gotten hard to purchase large supplies of this higher percentage. 35% sulfuric acid has become the standard for most farm irrigation systems. In order to determine your dose, enter your present irrigation water source pH and alkalinity in ppm along with your target pH into the [UNH AlkCalc](#).

The acid recommendations provided by the AlkCalc and the citric acid value provided earlier in this article are good starting points. In order to refine your specific acid dosage, you will need to use a digital pH meter that is temperature compensating and uses a two point calibration. We generally work in the lower end of the pH range, so use pH 4 and 7 calibration solutions. Wire prong meters and litmus paper are not nearly accurate enough to adjust an acid dose rate. Good pH meters use a porous glass bulb sensor that allows hydrogen ions to move through, then compares your water hydrogen ion concentration to that of a reference electrode also in the sensor.

A pH meter as described will cost between \$60 and \$200 with better meters on the higher end of this range. Make this a good purchase by following all directions for use, calibration and storage between uses. Be sure to remove the batteries at the end of the growing season and repurchase calibration solutions at least annually. Check with your local greenhouse or vegetable supply dealer or with catalog and online suppliers such as Ben Meadows, Forestry Suppliers, and GEMPLERS' for meters.

If your water requires acid to maintain an irrigation water pH of 6.2-6.5, then the best practice is to run your proportional injectors (Dosatron, Dosomal, Chemalyzer...) in a series with acid as the first station that always runs. That provides a constant supply of adjusted water to the root zone. When fertigating, it is likely that the dose of acid will need to be adjusted as every fertilizer has some degree of acidifying or alkalinizing potential. Use your calibrated pH meter to adjust the concentration of acid based on the output from the injectors. Your acid injector will probably need to be rebuilt at least annually to maintain an accurate dose rate.

*Mr. Bogash is with Penn State Extension in Cumberland Co. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2014>, February 28, 2014.*

VEGETABLE PRODUCTION

Commercial Vegetable Production Recommendations Guide for Pennsylvania Now Available On-Line

The 2014 edition of the Commercial Vegetable Production Recommendations guide is now available on-line.

The *Commercial Vegetable Production Recommendations* guide for Pennsylvania contains detailed information on growing vegetables based on research results as well as the knowledge and experience of growers, extension educators and specialists and industry personnel. It is intended to help commercial vegetable growers make informed decisions about which farming practices to use.

The 2014 version of the *Commercial Vegetable Production Recommendations* guide for Pennsylvania is now available on the web at <http://extension.psu.edu/plants/vegetable-fruit/production-guides>.

Bacterial Leaf Spot on Peppers

Timothy Elkner

Bacterial leaf spot (BLS) on peppers is becoming more common in Pennsylvania. We have had some wet spells during the last few growing seasons and bacterial diseases are often notoriously difficult to control, particularly during warm and wet conditions. However, recent research may show why more fields are having BLS outbreaks beyond these possible weather effects.

In 2013, Andy Wyenandt ran a pepper trial in New Jersey to determine if new races of BLS were present in the state. The results of the study indicated that there were at least 6 races of BLS present (at least 11 are known worldwide). This information is useful to Pennsylvania pepper growers because most pepper varieties only have resistance to between 3 and 5 races of BLS. Some of our more commonly grown varieties have even less resistance. If a new race appears in your field then you may suddenly have a disease issue in your peppers that you have not had to manage before.

From the practical standpoint, it may be a good idea to start trialing new varieties of pepper on your farm with increased resistance to BLS. This will be especially important if you have been growing types (usually older varieties) with resistance to fewer, if any strains of the disease. The variety list of peppers in the 2014 Pennsylvania Commercial Vegetable Production Recommendations (p. F-108) is one source of information for resistance listings; your seed or transplant supplier is another. Two varieties that have resistance to BLS races 1-5 that performed well in a recent variety trial in Pennsylvania are PS 1819 and Tomcat. Revolution, another popular variety, has resistance to races 1-3 and 5. Trialing new pepper varieties before you have a BLS problem can help you be prepared for the frequently changing situation with this disease.

Dr. Elkner is with Penn State Extension in Lancaster Co. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2014>, March 28, 2014.

Do you have a cover crop growing on a field in your farm? Will you be planting one this year?

I'm looking for farmers of all types interested in learning more about the quality of their cover crops (as measured by biomass, growth stage, C:N ratio and flowering density, if applicable) and willing to allow me to conduct a short, one-time study on one of their cover cropped fields. I'm especially interested in farmers growing a polyculture cover crop. I'll be sampling this spring as well as late this fall and next spring, so there will be future opportunities for participation.

Participation would involve answering a couple questions about how your cover crop was managed, and I would take a small destructive sample (7.5 square feet, distributed throughout a field) with two weeks prior to the termination of the crop.

I'm scheduling farm visits for this spring now, so please contact me as soon as possible to answer a couple of preliminary questions!

Contact me, Abbe Hamilton. At 413-657-6852 abbe@psu.edu.



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MARKETING

Marketing News Briefs

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The concept for this new report was initiated by United's Retail-Foodservice Board as a resource for United members to gain a comprehensive look at how chefs and restaurants are incorporating fresh produce on their menus. The report is developed by Datassential, a leading market research firm dedicated to the food industry, using data from its extensive menu database, MenuTrends.

Fresh Insights for Foodservice is free to United Fresh members and \$50 to non-members. To order the report today, visit United's website. If you have questions, please contact Jeff Oberman, United Fresh Vice President of Trade Relations, at 831-600-8922. For questions about the data or content in this report, contact Maeve Webster, Senior Director, Datassential at maeve@datassential.com.

From Inside United Fresh, United Fresh Produce Association, March 13, 2014.



VEGETABLE PRODUCTION

Reducing Soil Borne Disease with Cover Crops

Tianna DuPont

Soil-borne diseases can be devastating to vegetable crops. In the Northeast alone 1,687,080 tons of fresh market and processing vegetables on 264,490 acres, worth \$701,377,000 suffer 10-15% losses from soil borne diseases (NASS Crop Profiles, 2007). Disease suppressive cover crop rotations may provide an additional tool for managing soil borne disease. Researchers have documented significant increases in yield after sudangrass, brassica, millet and other cover crops. Here we describe recent results of a two season on-farm case study using cover crops to suppress Verticillium wilt in tomato.

Mustards, rapeseed and sudangrass contain a chemical and an enzyme in the plant cell wall. When these cover crops are chopped into small pieces with a flail mower and then quickly incorporated and sealed into the soil using a cultipacker or water, the chemical comes into contact with the enzyme and it breaks down into a chemical that behaves like a fumigant. The chemicals and the enzymes are not toxic by themselves, but when they come in contact with each other, the chemical is broken down by the enzyme into compounds that are toxic to soil-borne pathogens and even weeds seeds. Cover crops can also improve soil organic matter and related soil water holding capacity, infiltration and microbial activity which positively impact yields over time.



From 2010 to 2013 we worked with Harold Weaver from Meadow Gate Vista farm. Weaver planted strips of cover crops in fields that had a history of Verticillium wilt on tomato. We worked with mustard cv. Caliente 119 and sudangrass cover crops known to have "biofumigant" properties and compared them to buckwheat as a control. In 2011 tomatoes after a rotation of mustard and sudangrass used as a biofumigant yielded twice as much as tomatoes grown after the buckwheat cover crop control. Although growing and incorporating the cover crops was a lot of additional work, Weaver felt the yield boost made it worth the effort.

In 2013, we did not observe any differences in the yield between tomatoes planted after buckwheat or the sudangrass that was chopped and incorporated as a biofumigant. However, keep in mind that 2013 was a wet year. Verticillium impacts tomatoes by clogging up the vascular system of the plant making it difficult for the plant to move water from its roots to the rest of the plant. Tomato plants in 2013 at this site did not appear to be as stressed by Verticillium wilt like they would in a dry year, which

(continued on page 18)

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VEGETABLE PRODUCTION

Ethnic Greens and Herbs Workshop Successful

Kathleen Kelley and Dana Ollendyke

Thank you to all that attended the 2014 Ethnic Greens and Herbs Workshop. We had great feedback about the program.

During the workshop, Frank Mangan, extension associate professor at the University of Massachusetts, discussed WorldCrops.org, a website developed by Rutgers University Extension, the University of Massachusetts Extension, and Cornell University Extension. The World Crops site provides information about vegetables and herbs that can be grown in the Northeastern United States. The emphasis is on crops that are popular among ethnic groups living here and can be grown here. The site is organized according to the countries in the world.

Another helpful aspect of the site is the glossary which is available in English to Spanish and vice versa. A user can easily find the English or Spanish name for a particular type of produce as well as the genus and species of more than 350 entries. Example 1 shows that an avocado is called an "aguacate" (Spanish), "pagua" (Mexican), or "pahua" (Mexican) and the genus and species is *Persea americana*.

Example 1.

asparagus - espárrago (*Asparagus officinalis*)

asparagus bean – segadilla, dólico de Goa (*Psophocarpus tetragonolobus*)

avocado - aguacate (*Persea americana*), pagua, pahua (Mex.), palta

B

balsam pear - momórdiga (*Momordica charantia*)

bambara groundnut - bambara (*Voandzeia subterranea*)

Visitors can also find ethnic crops based on the country of origin. In the "Go to region" box on the main page, visitors can click on a region and then select a country. In example 2, Brazil is shown. The language spoken is Portuguese and some of the main crops used in this country are listed including cilantro, maxixe, and okra.

Example 2.

More ethnic produce industry information will follow in our future bi-weekly newsletters and Facebook page updates. To receive these newsletters, contact us at Kathy Kelley@psu.edu or 814-863-2196

The screenshot shows the WorldCrops.org homepage with a search bar and navigation links for Home, Glossary: Spanish-English, Glossary: English-Spanish, and Contact Us. Below the search bar, there's a "Go to Region:" dropdown menu with options for Africa, Americas, Asia, and Europe. Under the "Americas" section, there are further sub-sections for Mexico, Caribbean (Cuba, Dominican Republic, Puerto Rico), Central America (Costa Rica, El Salvador, Honduras), and South America (Venezuela, Brazil). The main content area displays a map of South America with a focus on Brazil, showing its coastal regions and major cities. To the right of the map, there's a section titled "Languages Spoken: Portuguese" with a list of crops. At the bottom left, there's a note about the diversity of Brazilian cuisine and its influences from indigenous peoples, Portuguese colonizers, and African slaves.

Dr. Kelley and Ms. Ollendyke are with the Department of Plant Science at Penn State Univ.

Reducing Soil Borne Disease...

(continued from page 17)

might explain why there were no differences. These results are not surprising and success in only one out of two years also reminds us that working with living cover crops to suppress soil-borne disease is likely to produce variable results and requires a long-term integrated approach. Success also depends on our ability as managers to successfully grow and incorporate the cover crop, as well as the variable whims of Mother Nature.

Tips for successful suppression of soil-borne disease with cover crops.

Grow a large lush cover crop. Mustard cover crops are picky – they need enough moisture, enough nitrogen, a good seedbed and sulfur to create the bio-active compounds. The nitrogen recommendation for caliente mustards is 120 units of nitrogen and 20 of sulfur/A. This nitrogen will be recycled for the following cash crop. Phosphorus and potassium should be at sufficient levels for your following cash crop. Most mustard cover crops including 'Caliente 119' are particularly susceptible to water stress which will cause them to mature and flower when they are still small. Spring or mid-August plantings tend to do best. Planting in droughty soils is not recommended. Sudangrass has similar nitrogen requirements, but it does well in warm summer conditions and can withstand drier soils. Rapeseed is fall planted and will take advantage of fall and spring moisture. Remember the more cover crop biomass you grow, the more bio-active compound you will have to suppress soil-borne disease. You want to grow large cover crops.

Choose appropriate varieties. Some cover crop varieties have been selected for increased levels of bio-active compounds. Mustard cvs. Caliente 199 and 119, rapeseed cv. Dwarf Essex, sudangrass cv. Trudan 8, sorghum sudangrass cvs. 79, SS-222 and SS-333 are among those that have done well in research trials. In addition, the mustard is selected for reduced seed viability to reduce potential problems with becoming weedy.

Plant at appropriate rates. Sudangrass should be drilled at 30-50 lb/A. Mustards and rapeseed are planted at 8-10 lb/A.

Chop the cover crop into small pieces. A flail mower does a good job of crushing plant tissue and breaking it into small pieces. The more the tissue is crushed the greater the chemical reaction of the bio-active compounds.

Incorporate the cover crop immediately after mowing. These bio-active compounds are volatile. As much as 80% can be lost if the cover crop is not incorporated within 15 minutes of mowing.

Irrigate or cultipack to trap compounds. Sealing the surface of the soil with water or a cultipacker can trap volatile bio-active compounds giving them more time to work.

For a more information on this project see the project report at <http://extension.psu.edu/plants/vegetable-fruit/research-reports>.

Ms. DuPont is with Penn State Extension in Northampton and Lehigh Counties. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension,
<http://extension.psu.edu/plants/vegetable-fruit/news/2014>,
February 27, 2014.

VEGETABLE PRODUCTION

Managing Bacterial Diseases in Onions

Emily Pfeifer and Steven Bogash

Sweet onion production has soared in Pennsylvania in recent years and bacterial disease challenges have grown right along with production. Steve Bogash provided interview-type questions to Emily Pfeifer, Ph.D. candidate working with Beth Gugino, Vegetable Pathologist due to her four years of research into sweet onion bacterial diseases.

Discolored scale inside otherwise asymptomatic onion bulb

Emily has been doing research on several bacterial diseases on sweet onions for the past four years as she prepares her doctoral thesis. With so much interest in onion production, this seemed like a good time to get her take on managing bacterial diseases in onions prior to the 2014 planting season. The questions were provided by Steve Bogash and the responses by Emily Pfeifer.



Pfeifer, 2013

What are the most significant bacterial diseases on sweet onions for PA and Mid-Atlantic growers?

Here in PA, we mostly see general soft rots and center rot of onion. Center rot begins as a foliar disease, and initial symptoms are typically small bleached, dry white lesions that expand and spread down into the neck and eventually into the bulb. The

bleached leaf will end up collapsing and other leaves may develop symptoms; this bleached leaf corresponds to a discolored scale within the bulb when it is sliced open.

We also see soft rots, caused by a very general bacterial pathogen that can rot just about any vegetable, especially when damaged, and can particularly be a problem post-harvest. In NY, growers see more slippery and sour skin, which are caused by two soil-inhabiting bacterial pathogens, but in PA, we see those diseases infrequently due to our more diverse crop rotations.

Are these diseases indigenous to our area or were they brought in on infected plants?

As part of my research, we have screened a small subset of the imported and locally grown transplants for the most common bacterial pathogens and we have indeed isolated rot-inducing bacteria from them. However, we are continuing to test more individuals to see how commonly they occur and link these specific strains isolated from the transplants to those that we isolated from rotting bulbs at the end of the season.

The particularly tricky part is most common bacteria we find in onions are also very common in the environment, and we routinely identify two or three different bacterial species from rotting bulbs. Not only do we find these bacteria on transplants, but also on weeds and sometimes in soils. In testing selected species of bacteria we have isolated from the surfaces and tissue of weeds, we have found that over half of the isolates we test have the ability to rot an onion.

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VEGETABLE PRODUCTION

Managing Bacterial Diseases... (continued from page 19)

In sourcing plants, what should a grower look for / ask their transplant producer in order to reduce the chance for bringing diseases into their fields?

A grower should look for plants that are dry to the touch (but not dried out) and ideally have relatively little soil on them (unless they are plug plants). When a grower receives their transplants, it's best to plant in the field as soon as possible - if you can't, I would suggest keeping them cool, opening the box or crate and spreading them out to prevent condensation from developing, which can encourage fungal and bacterial growth.

If you can start your own transplants, or buy them locally, that might be preferable simply because the plants seem to be in better condition. With bacterial diseases, any wound is a potential infection point, so the less injured the plants, the fewer chances for bacterial infection.

Is there variation among sweet onion varieties in their susceptibility to bacterial diseases? If there is, what varieties have tolerance / resistance?

As far as I know, there is no tolerance or resistance to bacterial diseases in onion, and especially not in sweet onion varieties. The high sugar content and low pungency of these bulbs likely make them perfect hosts for these pathogens, since bacteria grow more quickly in the presence of sugars and pungency compounds can sometimes restrict microbial growth. Plans are underway to conduct some variety trials to look more closely at varietal susceptibility.

How does plant fertility impact the incidence / seriousness of onion bacterial diseases?

Work that had been done previously in Georgia indicated that very high levels of nitrogen fertilization resulted in high levels of bacterial decay in onion. From our work here in PA, we saw a strong relationship between the levels of foliar N determined from tissue tests and the incidence of bacterial disease - actually that the growers with low foliar N at midseason had higher bacterial disease at harvest.

We did not see any close relationships between soil N and bacterial disease OR bulb size, so what this has begun to suggest is that N fertility is important early in the season, to get the foliar N up, but later in the season, N fertility may be less important. Additional trials are being planned to look more closely at nutrient relationships and develop research-based management recommendations.

How does plant density impact the incidence / seriousness of onion bacterial diseases?

Work that my advisor, Beth Gugino, has completed on onion spacing has indicated that spacing onions closer together results in lower bacterial disease incidence. The more closely the onions are spaced, the smaller the onion necks, and (we think) the more quickly the necks dry down, stopping the movement of bacteria into the bulbs.

Unfortunately, close spacing of onions also results in smaller onion bulbs, probably as a result of root competition for nutrients, so this works well for disease management, but not in terms of overall marketable yield. Thus, only consider close spacing if you can tolerate mostly medium-sized bulbs (2.25 to 3-in. diameter).

However, a good take-home message is that drying down the onion necks quickly and thoroughly will reduce the ability of the bacteria to move from the leaves into the bulb and potential-

ly reduce losses. We are currently working on a scouting protocol to help growers time their harvest based on bacterial disease symptoms in order to minimize bacterial movement from the leaves into the bulb.

If a field experienced high infection rates last season, how long should that field stay out of Alliums?

If that was my field, I would stay out of Alliums (including onions, garlic, leeks, and shallots) for two or three years to allow the crop residue to thoroughly decompose. I would also avoid following with beans, corn, alfalfa, or tomatoes immediately, because there have been reports of those crops being able to support some of our bacterial pathogens.

Through our grower survey, we identified more bacterial pathogens in soil after a mild winter, compared to a more severe winter, so the harshness of the off-season may play a role in how the pathogens survive from year to year. Hopefully that is a silver lining for onion growers, judging by the record cold temperatures of this past winter!

How does plastic mulch impact these diseases? Does mulch color matter?

We have observed a relationship between plastic mulch color, its effect on soil temperatures, and the incidence of disease in the field. Based on a number of replicated field trials using different mulch types, we have begun to recommend black biodegradable plastic mulch for several reasons.

Early in the season, the plants get the same amount of soil warming and weed suppression as traditional black plastic

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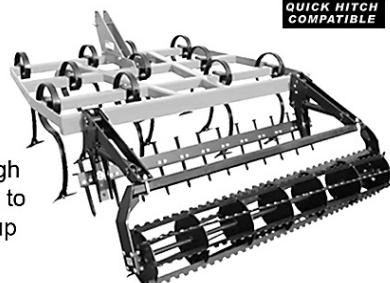
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VEGETABLE PRODUCTION

Managing Bacterial Diseases...(continued from page 20)

mulch, but in June, when air temperatures (and therefore soil temperatures) begin to really heat up, the mulch has started breaking down and soils will stay cooler. The mulch also stretches away from the rapidly growing onions, which prevents moist conditions around the bulb, which along with high temperatures, really favor bacterial growth.

There is a price premium associated with the biodegradable mulch and its reduced shelf life can make it challenging to work with, so anecdotally, some growers have told us they have had decent results when they slash the standard plastic on the side of their raised beds in the middle of the season to help lower soil temperatures by increasing air circulation.

Does straw mulch have an impact on these diseases?

We included straw mulch in a couple of trials early on and found it very challenging to work with. Not only did we have trouble keeping it in place when the plants were small, but we also were unsuccessfully managing weeds. In addition, we saw an increase in purple blotch, a common foliar fungal disease, because of reduced air circulation and higher humidity in the onion canopy.

The PA Vegetable Production Guide only lists copper and Mancozeb as bactericides for onions. How about other products that bolster a plants' defenses such as Regalia, and Actinovate AG, do they have a place in managing bacterial diseases in onions?

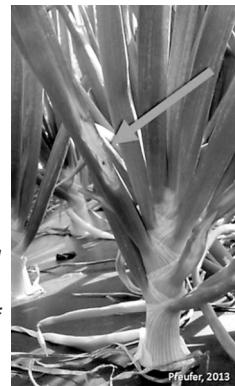
We completed some studies on plant-defense inducing products at our research farms, and we saw no differences in

disease management using plant defense-inducing products compared to the copper/mancozeb standard, that is, the plant defense inducers fared no better and no worse than copper/mancozeb. In our trials, we had included Actigard, Employ, and Companion and some combinations of those products with copper/mancozeb as well.

It may be worth re-evaluating the efficacy of these products now that we have developed a more reliable method for attaining uniform disease pressure within our research plots.



Collapsing onion leaf due to bacterial disease.



Bacterial symptom on onion leaf early in infection.

Ms. Pfeuffer is a graduate student in the Department of Plant Pathology and Environmental Microbiology. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2014/>, March 12, 2014.

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POTATO PRODUCTION

Growing Potatoes Using Plasticulture

William Lamont

The production of early potatoes for direct marketing or sale to consumers can be a very lucrative enterprise for many growers who only grow 3-5 acres of potatoes in Pennsylvania.

There are many excellent farm markets located throughout the Commonwealth that sell a wide variety of produce to consumers throughout the growing season. It is traditional here in Pennsylvania that in the late spring/early summer consumers are indeed anticipating the arrival of "new potatoes" or "B" size red potatoes at the local retail stands. These early potatoes command a high price and with the increasing popularity of specialty potatoes (different colored skins and flesh), growers are able to offer an increasing colorful display of potatoes to the consuming public. In order to provide high quality, early potatoes for their markets, an increasing number of growers in Pennsylvania are using intensive production technology or plasticulture (plastic mulches, drip irrigation, fertigation, high tunnels, and row covers). They have used this technology extensively for other selected vegetable crops on their farms. The use of plasticulture technology can provide for earlier production, increase marketable yields and improved quality of the product. In Pennsylvania we can have not only unpredictable growing conditions in the spring both in terms of temperatures and amount of precipitation, but during the growing season, which can cause a delay in the maturity of the potato crop. The quality of the potatoes can be affected by too much or too little water during the growing season. The use of plasticulture helps ensure that a grower can have potatoes for the early market.

Field Production

The benefits of using plastic mulch, drip irrigation, and row covers has been well-documented in both the research literature and popular press, and is an accepted practice for the production of many vegetable crops, not only in Pennsylvania, but around the United States and the world. The primary benefit of using plasticulture for potatoes is earlier production, greater yields, and higher quality.

Obvious advantages of plasticulture are:

plastic mulches warm the soil up earlier in the spring which in turn hastens the emergence and development of the potato plant and prevents weed growth in the row
drip irrigation in conjunction with the plastic mulches offer excellent control of soil moisture and the ability to fertigate
elimination of hillng
the potential reduction in disease pressure as well as the opportunity for insect management are all provided with the use of plasticulture

Soil temperatures taken in May using a hand held soil thermometer at noontime under a clear sky are typical of those experienced in constant monitoring. The ambient air temperature was 74° F. The soil temperature was measured at a 4-inch depth on the raised beds both with and without plastic mulch and with and without row covers. The soil temperatures for the raised beds without row covers were: red mulch 72° F, black mulch 72° F, metalized silver mulch 69° F and no mulch 71° F. Soil temperatures on raised beds under row covers were: red mulch 78° F, black mulch 80° F, metalized silver mulch 73° F and no mulch 77° F. This was a consistent trend and will continue until the plant canopy covers the surface of the raised bed at which time the temperatures under the mulch even out. The addition of row covers clearly increased soil temperatures.

Faster emergence and increased growth of potato varieties grown under row covers has been observed each year. For potatoes grown without row covers, the growth of the potato plants on the red and black mulch were equal while the metalized silver mulch was slightly behind and no mulch was much further behind. Under row covers, emergence and growth of potatoes under red and black mulch were again equal, with silver mulch slightly behind and then even further behind no mulch.

The following potato varieties have been used in the plasticulture system:

Keuka Gold (a light yellow flesh with white skin)

Dark Red Norland (a white flesh with red skin)

Eva (a white flesh with a bright white skin)

Michigan Purple (a bright white flesh with a purple skin color)

Red Pearl (a white flesh with a red skin producing 71% B size potatoes)

Adirondack Blue (a blue flesh with a dark blue skin)

Dark Red Norland is a very early maturing variety with a relatively small plant canopy, Keuka Gold, Michigan Purple, Adirondack Blue, Red Pearl, and Eva are later maturing varieties and have larger plant canopies.

The plastic mulch/drip tape applicator used in vegetable production is also used for potatoes. The raised beds are 4-inches high and 30-inches wide with the drip tape buried 3 inches deep in the center of the bed. Drip tape used is 8 mil-thick, has a 12-inch spacing between the emitter openings and a flow rate of 0.450 GPM/100feet of row. Seedpieces can be hand-planted using a bulb setter to make two rows of holes spaced 18 inches between the rows with the holes spaced 8-inches apart in the rows on the 30 inch wide raised beds. This would be for very small plantings.

For larger plantings, potatoes are planted in double rows 18 inches apart with 12 inches in row, using a water wheel planter without water application at the time of planting the potato seedpiece, as is done with vegetable transplants. It is important to have adequate soil moisture prior to making the beds and applying the plastic mulch and drip irrigation tape, to ensure that the hole made by the waterwheel transplanter will not collapse before the seedpiece can be placed in the hole. We did develop with colleagues in the Department of Agricultural and Biological Engineering a transplanter that utilizes cone-shaped dibbles that punch holes in the plastic bed, and can make holes 4 across, 2 across, or 1 depending on the crop, and in-row spacings from 6 to 24 inches again depending on the crop. It is currently with a fabricator who is considering manufacturing it. Prior to making the beds and applying the plastic mulch and drip irrigation tape, fertilizer can be broadcast on the field. An example used in our plantings is for 450 lbs/acre of 34-0-0, 500 lbs/acre of 0-10-10 and 500 lbs/acre of 0-20-10 to be broadcast evenly across the field. Spacing between the mulched beds is 6 feet. Though the distance between the mulched beds could be decreased to 5 feet apart, the plant canopies of the potatoes will quickly cover the space between the rows and can limit air circulation that is needed for disease control. Typar, a floating row cover material, is applied once the potato seedpieces are planted. Admire can be injected through the drip irrigation system for control of some insect pests, such as the Colorado potato bee-

(continued on page 23)

POTATO PRODUCTION

Growing Potatoes...(continued from page 22)

tle and then standard pest management practices can utilized the remainder of the growing season. On a side note of interest, counting was done on Colorado potato beetle adults found on the different plastic mulches and bare ground the end of May: black mulch-94 beetles, red mulch-54 beetles, no mulch-36 beetles and silver mulch- 13 beetles.

The potatoes are routinely checked for development, and when the tubers are nearly marketable size, the vines are killed using Diquat. The potatoes are dug using a double row level bed digger and then picked up by hand. We have used a single row digger, but found it is too difficult to get the whole 30-inch wide bed up the digger. Potatoes will be set right out on the edge of the bed. Harvest begins with Dark Red Norlands, then Michigan Purple, Red Pearl, Adirondack Blue, Kueka Gold and Eva. Although the plastic mulch and drip irrigation tape will travel up the digger chain, it is easier to remove the plastic mulch prior to digging. This is best accomplished by mowing the dead potato vines as close to the plastic as possible with a rotary mower and then loosen the soil along the edges of the plastic, and either remove it by hand or use a small retrieval unit that will make a small round bale of plastic. All plastic mulches significantly increased total and marketable yields for all varieties compared to bare ground. Marketable yields for potatoes grown with plastic mulch as compared to bare ground were for Dark Red Norland: Black-271cwt. Red-249 cwt., Metallized Silver-246 cwt., and no mulch-173 cwt. For Keuka Gold: Black-357 cwt., Red-372 cwt., Metallized Silver-364 cwt., and no mulch 262 cwt. For Eva: Black-325 cwt., Red-298 cwt., Metallized Silver-301 cwt., and no mulch-182. The same holds true for Michigan Purple, Red Pearl, and Adirondack Blue. The increased yields more than pays for the additional cost of the plastic mulch and drip irrigation tape. Although metallized silver mulch with or without a row cover had the coolest soil temperatures and slowest plant growth of the three colored mulches, the final yields are equal and sometimes better than the red and black mulch. There doesn't seem to be a corresponding increase in yield associated with an increase in plant growth. The positive effect of the red and black mulches covered or uncovered on the emergence of the potato is probably due to an increase in the soil temperature. This goes back to the fact that the rate of emergence and growth of sprouts from the seedpiece once it is planted is mostly a function of the soil temperature. It is important to remember that the bare ground potatoes also received drip irrigation so the yield response is mainly a result of the plastic mulch. Plastic mulch and drip irrigation should be used together to get the maximum benefit from the system. It is recommended that a good strong black plastic mulch 1 to 1.25 mil thick be used for the production of potatoes, since, if a plastic mulch lets any light through, the potatoes that are on the surface or partially exposed will green up and be render unmarketable.

High Tunnel Production

High tunnels are part of plasticulture technology and are used worldwide for the production of a wide array of horticultural crops. In Pennsylvania the use of high tunnels permits the earlier production of a number of vegetable crops such as tomatoes, peppers, egg-

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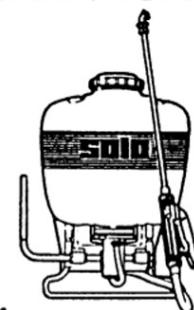
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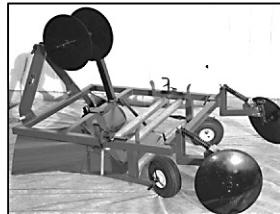
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POTATO PRODUCTION

Growing Potatoes... (continued from page 23)

plant, and leafy greens. The use of high tunnels allows the production of early potatoes and is especially profitable if grown/marketeted in conjunction with fresh garden peas and pearl onions, which are used together for a tasty spring dish. The use of high tunnels can provide growers the opportunity to market early red potatoes or red, white, and blue for the 4th of July holiday. The system of production is very similar to field production, except the equipment size is smaller. Plastic mulch, drip irrigation, and row covers are used inside the high tunnels. In a 17-foot wide high tunnel, 3-foot wide plastic mulch is used to make four small raised beds 18 inches wide and 3 inches high which are spaced 44 inches apart. A small 21 HP tractor and plastic laying machine is used to apply the 3-foot wide plastic mulch and drip irrigation tape. Application of the plastic mulch and drip irrigation tape is similar to field production. In the high tunnel black or red plastic mulch are good choices, since we want to really warm the soil up. If the plastic mulch and drip irrigation tape could be applied the preceding fall, it could then be ready for an early spring planting. A note of caution, rodents may be a problem if plastic mulch and drip irrigation are applied in the fall. If fall application is not possible, then the plastic mulch and drip irrigation tape can be applied as soon as it is possible to enter the high tunnel in the early spring.

Fertilizer can be broadcast in the high tunnel and pulled into the row or some can be broadcast and then fertigated. The rates would be similar to the field situation, although lesser amounts can be used since in a high tunnel a grower has complete control over soil moisture and fertilizer. Potato varieties used in the high tunnels have been Red Pearl- a red-skin/white flesh that makes 71% B size potatoes from the Wisconsin Potato Breeding Program; Eva- a white skin/white flesh from the Cornell Potato Breeding Program; and Michigan Purple- a purple skin/white flesh from Michigan State Potato Breeding Program. These were chosen in order to have some red, white, and blue skinned potatoes for our "Patriot Potato Salad" for the 4th of July. The potatoes were hand-planted in April on double-rows 13 inches apart, with the potatoes spaced 8 inches apart in the row. The row cover is placed over the plastic covered beds and the soil temperature is monitored until it reaches 50° F and then the potatoes were planted which, for us in State College, PA, is mid-March to early April. Note: the row cover will provide some protection from an unexpected freeze event but it is recommended that some source of portable backup heat is

available to prevent the tops of the potatoes from being killed off.

Potatoes were irrigated as needed and no pesticides were applied to the crop. The potatoes were dug by hand in June to be ready for the 4th of July market. The soil temperature at time of digging was 79° F. Red Pearl yielded 120 lbs. of potatoes, the Eva yielded 100 lbs. of potatoes, and Michigan Purple yielded 139 lbs. of potatoes. There were less than 10 tubers in the entire tunnel that had any defects. Red Pearl yielded 375 tubers/30 plants or 12.5 tubers per plant.

Eva yielded 112 tubers/30 plants or 4 tubers per plant and Michigan Purple yielded 90 tubers/30 plants or 3 tubers per plant. The skin colors were excellent on all varieties. To take advantage of the skin colors of the potatoes and the 4th of July holiday, an American flag (3' wide by 5' long) made of the potatoes was constructed to show how they could be promoted in a retail market. These potatoes lend themselves to marketing in small woven baskets, in attractive displays, in polybags, or plastic clamshells and can command a high price.

If a grower had a 17' by 96' high tunnel and grew four rows at the 13" double-row, 8-inch in-row spacing, the yields for Red Pearl would be 1,104 lbs. of potatoes, Eva- 920 lbs. of potatoes and Michigan Purple- 1,278 lbs. of potatoes. The price of specialty potatoes at the food stores, according to a chart presented by the National Potato Promotion Board is. 86/lb. If advertised and promoted at local retail markets, \$1.50 for 1.5lbs. could be a reasonable price to expect. If we use \$1.50 for 1.5 lb. then the gross return for each of the varieties would be Red Pearl- \$1,104, Eva- \$920 and Michigan Purple- \$1,278. This is for an area of production that is only 0.037 of an acre.

Dr. Lamont is with the Department of Plant Science at Penn State Univ. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension,

<http://extension.psu.edu/plants/vegetable-fruit/news/2014>,

February 28, 2014.

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VEGETABLE PRODUCTION

New Pesticide Labels will Better Protect Pollinators

In an ongoing effort to protect bees and other pollinators, the U.S. Environmental Protection Agency (EPA) has developed new pesticide labels that prohibit use of some neonicotinoid pesticide products where bees are present.

EPA released the following press release:

"Multiple factors play a role in bee colony declines, including pesticides. The Environmental Protection Agency is taking action to protect bees from pesticide exposure and these label changes will further our efforts," said Jim Jones, assistant administrator for the Office of Chemical Safety and Pollution Prevention.

The announcement affects products containing the neonicotinoids imidacloprid, dinotefuran, clothianidin and thiamethoxam. The EPA will work with pesticide manufacturers to change labels so that they will meet the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) safety standard.

In May, the U.S. Department of Agriculture (USDA) and EPA released a comprehensive scientific report on honey bee health, showing scientific consensus that there are a complex set of stressors associated with honey bee declines, including loss of habitat, parasites and disease, genetics, poor nutrition and pesticide exposure.

The agency continues to work with beekeepers, growers, pesticide applicators, pesticide and seed companies, and federal and state agencies to reduce pesticide drift dust and advance best management practices. The EPA recently released new enforcement guidance to federal, state and tribal enforcement officials to enhance investigations of bee kill incidents.

From Vegetable and Small Fruit Gazette, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2013>, September 1, 2013.

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BERRY PRODUCTION

That's A Berry Good Question! Spring Bramble and Blueberry Fertilization

Kathleen Demchak and Cathy Heidenreich

Our berry good question this month brought to mind a number of other questions about fertilization that we are frequently asked. So more questions and answers follow this first question from Sarah Blevins, S.J. Blevins Berries, etc. Thanks for asking, Sarah!

Foliar symptoms of magnesium deficiency in blueberry



Q1. I'd like to get some tasks out of the way before field work gets too busy. What's the earliest date when I can make my spring nitrogen applications for my raspberries?

A1. The plants won't actually take up much fertilizer until plants start to grow, so fertilizing before then will provide little benefit, and the fertilizer may wash away or leach out if heavy rains occur. With raspberries, blackberries, and blueberries, the fertilizer applications can be split – in fact, for blueberries it is recommended that half of the fertilizer be applied at bud-break, and the other half 4 to 6 weeks later. Of course, you actually have to make *both* applications in order for this practice to be of benefit.

Q2. Rates for spring fertilization are given as "per acre". Is this assuming that the fertilizer is banded, or broadcast? It seems like a waste to fertilize the row middles.

A2. The rates given are given per acre, but the fertilizer is applied along the rows for brambles (over the rows in about a 2' wide band if these are primocane-fruiters that are mowed down). For blueberries, the fertilizer can be applied in a circle around blueberry bushes. Just be sure to stay about a foot from the plants to avoid burning the roots.

Q3. It's sometimes easier to find fertilizers like 10-10-10 than it is to find just nitrogen. Can I apply 10-10-10 or a similar blend instead of just nitrogen?

A3. There can be some negative consequences to applying unneeded nutrients. With phosphorus (the second number on the bag), there are environmental issues such as those concerning the Chesapeake Bay, but additionally, you could be causing your plants problems, too. Farm soils that have received manure applications, or phosphorus frequently, often have very high phosphorus readings. Sometimes when a tissue test is done - usually because the plants look lighter green than usual - the plants are found to be low or deficient in zinc or iron. Excess phosphorus can tie up micronutrients, and it is very difficult, if not impossible, to remove the phosphorus. This situation is often first seen on sweet corn on the farm, but we also frequently see low micronutrient levels in berry crops from excess phosphorus.

We less frequently see other deficiencies occur when extra potassium (the third number on the bag) is applied, with the exception of occasional magnesium deficiencies. It is important to note brambles have a relatively high need for potassium in fruit. Preplant incorporation is the most effective means of supplying K and subsequent additional of K is not often needed. The exception to this is on sandy soils where K has a tendency to be leached out. Fertigation may be used to supply additional K in established plantings. While muriate of potash (KCl) is an inexpensive source of K, it is best to use another K source for brambles and blueberries as they are chloride-sensitive. Recommended K sources include potassium sulfate or potassium magnesium sulfate (SulPoMag).

Also, note that excess calcium, such as from heavy liming, can result in deficiencies of both potassium and magnesium.

Q4. How often should I be doing a soil test in perennial berry crops?

A4. Every second year is good enough if you are in a "status quo" situation. However, if adjustments needed to be made last year, it's good to re-test this year to see if changes are on track.

Q5. Do I need to do a soil test if I do a tissue test?

A5. Doing both often really helps, especially when a deficiency of one element is caused by an excess of another, as in the scenarios mentioned under Q3. The plants would not have typically shown excessive phosphorus or excessive calcium levels in the tissue test results, so the soil test gives us the real

(continued on page 27)

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BERRY PRODUCTION

That's A Berry Good... (continued from page 26)

cause. In addition, only the soil test will tell us the soil pH, which affects the availability of almost all elements significantly.

Q6. How can I tell whether dead tips on my blueberries are from winter injury or boron deficiency?

A6. Last month we published an article by Marvin Pritts on ways to diagnose winter injury (See "Polar Vortex – the Possible Good and Bad of Winter 2014"). For blueberries, he suggested putting some branches in water for a few days, and then cutting through them for signs of brown (i.e., dead) tissue.

However, it's always useful to have a history of soil or tissue analysis for your farm – this also gives a good indication of whether your soils are likely to be deficient in boron or not. In Pennsylvania, boron levels tend to be adequate in heavier soils, but can be low in lighter soils. New York State soils, however, have a tendency to be low in boron, a micronutrient essential for root growth.

Soil boron is very prone to leaching, especially in soils with low organic matter content, so it is one of the most commonly observed micronutrient deficiencies in berry plantings. Boron deficiencies lead to poor root growth, which in turn causes deficiencies of other nutrients due to poor uptake. This sometimes manifests itself when leaf analyses indicate nutrient deficiencies, even though the soil pH is in range and soil test results indicate sufficient levels of the nutrient(s). (Note that poor root growth from other causes can have the same effect). Boron is also important in pollination.

*Ms Demchak is with Penn State Univ. and Ms. Heidenreich is with Cornell Cooperative Extension. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news/2014>, March 28, 2014.*

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