

## Urge Your State Legislators to Increase Ag Research and Extension Funding

The current funding trajectory for Penn State's College of Agricultural Sciences is unsustainable and has placed the college's agricultural research and extension programs at risk. This has occurred at a time when the demand for science-based solutions from the agricultural community in Pennsylvania is growing and their requests for additional expertise and information is increasing.

In his proposed budget, Governor Tom Wolf has committed to a two-year process to fully restore the budget cuts of four years ago to higher education - which included the 19% budget cut to the College of Agricultural Sciences that reduced agricultural research and extension funding to 1999 funding levels. For the college, this restoration would equate to approximately a \$5 million increase in FY 2015/16. However, the line item that funds agricultural research and extension in the college - the Land Scrip Fund - is flat funded in the Governor's budget.

We are truly at a turning point. The college's current state funding level is approximately \$2 million less than it was 15 years ago. This year alone, college pension increases will be near the \$500,000 mark. This is simply not sustainable.

Penn State Agricultural Council, the industry advisory group to the college, strongly supports the restoration of \$5 million in FY 2015/16 for funding for agricultural research and extension programs to be located in the Land Scrip Fund in the Pennsylvania Department of Agriculture budget.

This funding would support \$2.2 million to address inflation-

ary costs and allow the college to maintain current levels of programming.

In addition, \$1 million would be used to assist agribusiness in Pennsylvania in addressing sweeping new food safety regulations under the Food Safety Modernization Act (FSMA). The agricultural industry has identified this area as a top priority. If funded, the college will hire additional staff to specialize on pre- and post-farm gate best practices as well as focus additional resources on food safety requirements pertaining to animal feeds.

The remaining funds would allow the college to rebuild capacity around several priority issues facing agriculture in the Commonwealth, which include:

- Water quality issues around nutrient management on farms
- Storm water management in Pennsylvania communities
- Technology transfer and education focusing on aspects of precision agriculture
- Food production and safety best practices to increase productivity and address changing environmental limitations
- Education to assist agribusinesses in addressing increasingly complex regulatory requirements while also providing regulators with science-based information to inform the development of those regulations.

Contact your legislator and ask them urge the leaders of the General Assembly to increase the agricultural extension and research funding by \$5 million in this year's budget.

## Save the Date – August 5 - 2015 PVGA Field Day at Landisville

The 2015 Pennsylvania Vegetable Field Day will be held on Wednesday, August 5, 2015, at Penn State's Southeast Research and Extension Center in Manheim (Landisville) from 9:00 a.m. until about 2:00 p.m.

Registration will begin at 8:30 a.m. and growers will be able to visit the commercial exhibitors until the program begins. At 9:00 a tour of the vegetable research trials will begin. After lunch, the vegetable research tour and discussion will continue until about 2:00 p.m.

The field day enables growers to observe firsthand the various vegetable and small fruit research projects underway at the research farm - much of it sponsored in part by the Association and the Pennsylvania Vegetable Marketing and Research Program. Extension educators Steven Bogash and Timothy Elkner and other researchers have numerous projects underway at the farm.

Plan now to spend the day in Landisville.



*Penn State Extension Educator explaining his high tunnel tomato trials at the 2013 PVGA Field Day.*

## NEWS



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## In Memory

### Burton Hetherington

Burton Hetherington, Ringtown, passed away unexpectedly May 11 at his home at the age of 86. He was a PVGA Life Member, former Director and former lobbyist for the Association. He served as one of the Association's representatives to the committee that set up the joint fruit and vegetable meetings in Hershey that have become the Mid-Atlantic Fruit and Vegetable Convention.

Born in Ringtown, June 27, 1928, Burton was raised in a farming family. He served for many years as manager of the Berwick Vegetable Cooperative before buying and operating Tamaqua Fruit Co.

He was a lifelong member of Aurand Memorial United Methodist Church, Ringtown. He was very active in the Republican party and was the founder of the Penna. Ag Republicans, as well as serving as a councilman on the Ringtown Borough Council. He served on the Board of Trustees for Penn State University and was a member of the Penn State Schuylkill Advisory Board. Burton was also a member of F&AM Lodge 737, Caldwell Consistory, Rajah Shrine.

He is survived by his wife of 63 years, Louise; four sons, Barron "Boots" and his wife, Robin, Ringtown, Richard and his wife, Laurie, Matthews, N.C., David and his wife, Lori, Colorado Springs, Colo., and Randall Hetherington and his wife Deborah, Odessa, Texas; 12 grandchildren; a great-granddaughter.

### Donald Kaelin

Donald Kaelin, of Wexford, passed away on May 2 at the age of 83. He, along with his wife and son Curtis, operated a fruit and vegetable farm, farm market and greenhouse business on a farm purchased by his father in 1946.

A graduate of Penn State University with a degree in agriculture, he was recruited by the Air Force to serve as a Strategic Air Command pilot of a Boeing B-47 Stratojet during the Cold War in the 1950s. He returned to the farm when his father died and founded Kaelin Process Equipment Co. that manufactured and sold equipment for the dairy industry in Pennsylvania, Ohio and West Virginia. Meanwhile, he began operating his father's farm on the side and opened the farm's roadside market in 1976 to sell sweet corn, peaches, apples, tomatoes, peppers and pumpkins. In the 1990's he retired from the equipment business to devote full time to the farm business.

He was a member of Trinity Evangelical Lutheran Church in Wexford and the North Hills Lodge 716 F&AM.

He is survived by his wife Ellen, his son D. Curtis, who just stepped down as a Director of the Association; daughter-in-law Jennifer; and grandchildren Matthew and Abby.

*Information from [post-gazette.com](http://post-gazette.com), May 5, 2015.*



**Grown in PA. It makes a difference.**

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

## National News Briefs

### FDA Proposes Broadening Exemptions for Agricultural Food Retailers

The Food and Drug Administration (FDA) is updating the regulations on registration of food facilities which includes retail food establishments offered on some farms. Under the current regulation, any facility that manufacture, process, pack or hold food for consumption in the U.S. must register with the FDA. Under a new proposed rule, exempt food facilities would include roadside stands, farmer's markets and Community Supported Agriculture programs that would expand the number of farms removed from the registration requirements and provide relief from the preventive controls rulemakings under the Food Safety Modernization Act according to the FDA. Comments on the proposed rule may be submitted until June 8, 2015 at <http://www.regulations.gov> and by entering FDA-2002-N-0323 in the search box.

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, May 2015.*

### U.S. House Votes to Eliminate Death Tax

The U.S. House of Representatives approved legislation to repeal the federal inheritance tax, a move supported by farmers and small business owners.

The vote fell mostly on party lines, with most of the Republicans representing Pennsylvania in the House voting for the measure and the state's Democratic representatives voting against the bill. It now heads to the Senate for their consideration.

PFB President Rick Ebert said estate taxes can cause significant harm for farm families because their assets are not in the form of cash, but are instead tied up in land and equipment.

"Estate taxes can be a significant barrier for farmers seeking to pass their farm onto the next generation. Permanent repeal of the estate tax will help farm families continue to farm after the death of a family member, without having to sell key assets like land or equipment to pay the tax," Ebert said.

While Congress has been successful in rolling back the tax rate and increasing exemptions, farmers still worry about the long-term ramifications of estate taxes, said Bob Stallman, president of the American Farm Bureau Federation.

"Previous congressional action to increase the exemption provided important relief, but estate taxes still weigh on many farm families. Some must slow growth to remain exempt," he said. "We need tax policies that help capital-intensive businesses like farms and ranches, and that don't stand in the way of sons and daughters ready to follow the agricultural legacy of their parents."

Rep. Glenn "GT" Thompson, a Pennsylvania Republican, said Congress is concerned that estate taxes are hampering the succession plans of small businesses, many of which do not survive when passed to succeeding generations.

"Pennsylvania's families should be able to work hard and save without having to worry about whether their assets can be passed along to their children and grandchildren," he said. "The federal tax code should not be punitive, rather we should support small business owners and our family farms."

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, May 2015.*

### Accurate Food Labeling Bill

In recent years, unfounded consumer fears over the use of biotechnology in food have prompted several ballot initiatives in states that could have led to mandatory labeling.

So Farm Bureau is pushing for a nationwide standard for voluntary labeling that will address consumer concerns, but not paint an unfair picture that biotechnology is inherently unsafe.

Recently, a bipartisan group of federal representatives introduced the Safe and Accurate Food Labeling Act that would call on the U.S. Department of Agriculture to devise national labeling standards, much like the organic labeling standards developed by the agency.

"There is a need for a federal solution," said Andrew Walmsley, director of congressional relations for the American Farm Bureau Federation. "When you look at state-by-state approaches, having a patchwork of regulations is harmful for growers and consumers."

In recent years, some groups have called for labeling laws in certain states for food that contains products derived from genetically modified organisms (GMOs). While the scientific rigor has repeatedly found that GMO technology is safe and results in no material difference in crops grown with the technology, activists have pushed for labeling laws. If several states develop their own labels and each with their own standards and language, it would add costs for food manufactures, which would be passed on to consumers. Labeling also implies that a product is inherently unsafe, Walmsley said.

"Historically, we've reserved labels for important nutrition and health information," he said. "We need to keep the sanctity of that label. A mandatory label needs to be reserved for health and safety."

The Safe and Accurate Food Labeling Act—H.R. 1599—would clarify that the federal Food and Drug Administration is the nation's leader on food safety. The FDA has the authority to review all GMO technology, and to require a label if the produce is materially different than its traditional counterpart. During Congressional hearings, FDA officials have reiterated their belief that labeling GMO-containing products is unnecessary, Walmsley said. Under the bill, the USDA would be required to develop labeling standards for any company that seeks to voluntarily label their products.

"We don't think mandatory labeling is the way to go, because it implies risks," Walmsley said. "We believe in a consumers' right to know, and that is why we think it is best done through a voluntary program, developed through a transparent process."

The bill has 30 co-sponsors, including nine Democrats, and is currently before the House Agriculture Committee. Pennsylvania Farm Bureau has written letters to the state's Congressional delegation seeking their support for the legislation.

Farm Bureau is concerned a further surge in mandatory labeling initiatives will undermine research into the use of GMO technology, which is a valuable tool that farmers need to meet the growing needs of the population, Walmsley said.

"A mandatory label would have a huge economic impact, and would affect the future of agriculture innovation. We need to get this public policy right," he said. "We need all the tools in the toolbox for our farmers."

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, May 2015.*

*(continued on page 4)*

## NEWS

**National News Briefs...** (continued from page 3)**Bills Introduced for Trade Promotion Authority**

Legislation has been introduced in both the House and Senate to provide for trade promotion authority, which serves to streamline negotiations.

Senators Orrin Hatch, Ron Wyden and Rep. Paul Ryan have introduced legislation in their respective chambers which will call for trade promotion authority. The result could be growth in agriculture exports.

"This bipartisan effort advances an important policy objective just as the administration is engaged in major trade talks such as the Trans-Pacific Partnership," AFBF President Bob Stallman said. "TPA streamlines negotiations and strengthens our position at the bargaining table."

American agriculture will benefit through trade promotion authority as farmers seek to take advantage of new markets and a growing international demand for our nation's farm products, Stallman said.

"The U.S. is coming off a record year of \$152 billion in agriculture exports," he said. "TPA will help keep that trend moving forward."

The United States is in the midst of negotiating an ambitious treaty with the Trans-Pacific Partnership, a multi-nation deal that could provide significant benefits to farmers. Trade promotion authority is a key piece of those negotiations. If the Trans-Pacific Partnership is approved, it's expected to result in a sharp increase in dairy exports, a move that would benefit Pennsylvania producers. Japan and Canada, which are also participating in the trade negotiations, are already major importers of U.S. dairy products.

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, May 2015.*

**Senate Urged to Stop WOTUS Rule**

Earlier in May, the House of Representatives did its job to stop the Waters of the U.S. rule, passing a bill by a vote of 261 to 155. Now it's time for the Senate to do the same. Growers are urged to contact their Senators and urge support for S. 1140, the Federal Water Quality Protection Act.

The Waters of the U.S. rule radically expands the jurisdiction of EPA and the Army Corps of Engineers over farms. The rule tells farmers how they can use their land and imposes burdensome permitting requirements to engage in routine farming practices. By expanding jurisdiction over more land, the rule also exposes more farmland to the threat of lawsuits from citizen groups. Farmers will also face fines in excess of \$37,000 per day for violations of the CWA, especially concerning due to the lack of clarity in the regulation.

S. 1140 forces EPA and the Army Corp to withdraw the rule and re-propose it following the limits set by Congress and the U.S. Supreme Court. This is particularly important since EPA released their final Waters of the U.S. rule on May 27, despite strong opposition from agriculture, states and business interest across the country.

Growers can call Sen. Pat Toomey's Washington office at 202-224-4254 or email him from his website at toomey.senate.gov. To contact Sen. Robert Casey, call his Washington office at 202-224-6324 or email him from his website at casey.senate.gov.

*From Action Alert, Penna. Farm Bureau, May 28, 2015.*

**Farm Bureau Announces Rural Entrepreneurship Challenge**

The American Farm Bureau Federation is holding a Rural Entrepreneurship Challenge, with contestants competing for \$145,000 to fund their projects. The contest, now in its second year will give startup funds for businesses in rural areas. It's the first national business competition focused on rural entrepreneurs working in agricultural related businesses. Contestants must have a business idea related to agriculture and food, including value-added processing, food hubs, community-supported agriculture, farm-to-table restaurants and related activities. Businesses that are indirectly related to agriculture, including crop scouting, agritourism and agriculture technology companies may also compete. Businesses must be based in a rural community, as defined by the U.S. Census Bureau, and located in a county with less than 50,000 residents, or a town with less than 2,500 residents. Applications, including a business plan, video pitch and photos, must be received by June 30. Applicants must be Farm Bureau members. Farm Bureau will name the top 10 teams on Oct. 15. Six teams will win \$10,000 in startup funds and four finalists will win \$15,000 in funds and compete in a live competition held at AFBF's 97th Annual Convention in Orlando, Florida, in January. To submit your application, or for more information, visit: [www.strongruralamerica.com/challenge](http://www.strongruralamerica.com/challenge).

*From Farm Bureau Express, Penna. Farm Bureau, May 8, 2015.*

**Ozone Standards Could Harm Agriculture**

New proposed ozone rules by the federal Environmental Protection Agency could place a number of rural Pennsylvania counties in violation of air standards, Pennsylvania Farm Bureau said in comments to the agency. The EPA has proposed more stringent standards for air ozone levels, despite the fact that ozone emissions have been cut in half since the 1980s. But if allowed to move forward, the EPA's standards would mean dozens of Pennsylvania counties would fail those new standards, and face restrictions.

New ozone standards could mean that emissions from agriculture equipment and pesticide applications would face monitoring or control measures. Those control measures could cut production, restrict pesticide applications, restrict concentrated animal feeding operations and require costly control measures for food processing industries. Farmers would also face indirect costs through more expensive equipment, restrictive permit requirements and potential loss of federal highway funding. Also troubling is the potential impact the standards would have on business expansion and the ability of agriculture to stay competitive in global agriculture, Pennsylvania Farm Bureau said in comments.

"This is of great concern to PFB, whose mission is not only to increase the viability of farmers and ranchers but to improve the quality of life in Pennsylvania's rural communities," PFB said in comments. "This proposal's hardship to rural Pennsylvania is real and immediate, while the benefits are unverified and uncertain."

*From the Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, April 2015.*

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## NEWS

## State News Briefs

### Property Tax Reform Takes Significant Step Forward

Attempts to reform how school districts fund public education won a significant victory this month as the Pennsylvania House voted for a measure to reduce property taxes. The 109 to 86 vote was a bipartisan show of support to shift some of the school funding burden away from property taxes and instead use a mixture of personal income and sales tax. The bill now heads to the Senate for consideration. House members supported a provision, introduced by Rep. Stan Saylor, a York County Republican, which calls for a dollar-for-dollar shift in property taxes with other funding sources. The provision was attached as an amendment to House Bill 504, which would expand the sales tax exemption currently in place for production agriculture to timber operations. PFB supported both the Saylor amendment and House Bill 504. PFB President Rick Ebert thanked lawmakers for addressing property tax reform. "The legislation is a fair and equitable way to finance Pennsylvania's public schools, because every dollar raised by increases in personal income taxes and the state sales tax would be used to provide property tax relief for landowners," Ebert said. House Bill 504 will bring \$5 billion for property tax relief, or a 20-30 percent reduction in taxes depending on the school district, according to lawmakers. To achieve the reduction, the bill calls for increasing personal income taxes to 3.7 percent from its current 3.07 percent and increasing sales taxes to 7 percent from 6 percent. Current sales tax exemptions would remain. Pennsylvania Farm Bureau continues to support and advocate for the total elimination of property taxes, but believes the bill passed by the House makes significant strides toward that goal.

From *Farm Bureau Express*, Penna. Farm Bureau, May 22, 2015.



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### Help for Whole-Farm Revenue Protection Program Requested

Pennsylvania Farm Bureau sent a request to the Risk Management Agency within the U.S. Department of Agriculture to allow Pennsylvania farmers the ability to utilize the Whole-Farm Revenue Protection Program. The program provides a risk management safety net for all commodities on the farm under one insurance policy. Because many Pennsylvania farms have diversified operations, the whole-farm program could provide additional protections, PFB President Rick Ebert said in a letter to RMA.

"This program provides a risk management safety net for all commodities on the farm under one insurance policy, giving it the potential to be an incredibly useful tool for Pennsylvania's producers, who often have diversified operations and may not be able to take advantage of other reliable risk management tools," Ebert said. "It also allows for producers who already have protection for individual crops to get additional protection while insuring their whole farm."

There are several barriers that have so far prevented the program from being available to more Pennsylvania farmers. PFB suggested several potential improvements to the program to make it available to more Pennsylvania farmers including simplifying marketing records for direct marketers, establishing a revenue floor to lessen the impact of reduced yields during natural disasters and ensuring the program reflects the crop values of market outlets for individual producers.

From *Penna. Agricultural Alliance Issues Update*, Penna. Farm Bureau, May 2015.

### Senate Committee Passes Bill to Clarify Inheritance Tax Exemption for Farms

The Senate Finance Committee passed a bill that would clarify the state inheritance tax exemption for family farmers.

Senate Bill 580, introduced by Sen. John Gordner, would clarify that farms operating as corporations, limited liability companies or family trusts are eligible for inheritance tax exemptions.

The General Assembly passed Farm Bureau-supported legislation in 2012 to eliminate the state's inheritance taxes on

(continued on page 7)

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**State News Briefs** *(continued from page 6)*

family farmers. However, technical interpretations made since the law passed have limited the opportunity for many farm families to benefit from the tax exemption.

The current family farm exemption only applies when the farm is passed from person to person, and not when the farm is passed by or through a legal entity, such as a corporation or LLC. Gordner said his legislation will clarify the intent of the original law.

“Prior to 2012, some family farms had to be sold by heirs to meet the inheritance tax burden, when otherwise the family would have been interested in continuing the operation,” Gordner said. “We took an important step that year by enacting the exemption, which allows many families to remain in agriculture, rather than selling the farm to a corporate farming entity or developer.”

Senate Bill 580 now heads to the full Senate for consideration. PFB, which played a key role in drafting the legislation, will work with lawmakers to achieve passage of the bill.

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, May 2015.*

**PUC Presents Energy Generation Rule**

Published in the May 9 PA Bulletin was a proposed Rule by the Penna. Utility Commission (PUC) to limit the energy output from farmers and others using alternative energy generation facilities which go into the grid. Details: <http://www.pabulletin.com/secure/data/vol45/45-19/858.html>

*From AG ONE Newsletter, Penna. State Council of Farm Organizations, Issue 2015-6, May 13, 2015.*

**Committees Move Ag Easement Bills**

On May 6, two agricultural easement bills moved through committee:

The House Local Government Committee reported out House Bill 859 (Staats-R-Bucks) excluding from tax a transfer of a perpetual agricultural conservation easement as defined by the Agricultural Area Security Law.

The Senate Finance Committee reported Senate Bill 556 (McIlhinney-R-Bucks) which excludes from the Real Estate Transfer Tax a conservation easement in perpetuity having as its purpose preservation of open or agricultural land to the U.S., Commonwealth of PA, or to a 501(c)(3) organization which has as its purpose land preservation.

*From AG ONE Newsletter, Penna. State Council of Farm Organizations, Issue 2015-6, May 13, 2015.*

**Clean and Green Bill Moves Through Committee**

House Bill 806 (Causer-R-McKean) was reported out by the House Agriculture & Rural Affairs Committee May 5. This bill protects those enrolled in Clean and Green from higher property taxes in counties where county-wide reassessment has not taken place.

*From AG ONE Newsletter, Penna. State Council of Farm Organizations, Issue 2015-6, May 13, 2015.*

**Budget Numbers Still Improving**

The Penna. Revenue Department May 4 announced that collections in April exceeded expectations by \$201 million. This *(continued on page 8)*

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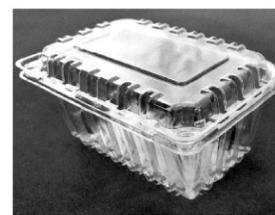
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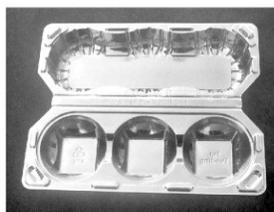
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## NEWS

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brings year-to-date revenues to \$569.1 million above estimate. This extra revenue was seen in Corporate Net Income Tax, Personal Property Tax, and Sales & Use Tax. Two areas where revenues came in lower than anticipated were Real Estate Transfer Tax and cigarette/table games/liquor taxes. This \$569.1 million surplus may impact Budget negotiations between the Governor and General Assembly.

From **AG ONE Newsletter**, Penna. State Council of Farm Organizations, Issue 2015-6, May 13, 2015.

**Other Senate Committee Agriculture Bill Updates**

Senate Bill 720 sponsored by Aument (R-Lancaster) has been referred to the Senate Judiciary Committee. It would provide protection from civil liability for owners and operators of agritainment activities. Agritainment is defined as "tourism-related, recreational or educational activities located on farms in Pennsylvania such as corn mazes, pick-your-own crop harvests, hay rides and farm vacations." Because many activities involved in the agritainment business are frequently not covered by customary farm liability policies, farmers face a number of challenges in securing adequate coverage and face liability risks when opening up their land to the public.

Without passage of Senate Bill 756 (Schwank-D-Berks) or similar legislation, First Industries which provides loan guarantees for farm credit institutions will sunset July 15, 2015. SB 756 is in the Senate Community & Economic Development Committee.

From **AG ONE Newsletter**, Penna. State Council of Farm Organizations, Issue 2015-6, May 13, 2015.

**New Farm Show Director Hired**

A York County woman who led a tourism bureau will now serve as the director of the Pennsylvania Farm Show Complex.

Sharon Altland will take over operations of the complex in Harrisburg, which hosts the annual Farm Show and other activities. Altland previously served as vice president of operations for the Hershey-Harrisburg Regional Visitors Bureau.

"Sharon has been a valuable asset to the complex for nearly a decade through her work in the Hershey-Harrisburg Regional Visitors Bureau," said Agriculture Secretary Russell Redding. "Her knowledge of the complex and the fresh perspective she brings to its daily operations are a great asset as we continue to attract nationally-recognized and world-class events, and as we prepare for the 100th Pennsylvania Farm Show next January."

Heidi Svonavec served as acting director following the death of executive director Sen. Michael Waugh in October 2014. While at the Hershey-Harrisburg Regional Visitors Bureau, Altland was in charge of marketing, public relations and sales for the bureau. She is looking forward to building on the prior success of the Farm Show complex.

"The complex is a major economic driver for our region, and a close partner with the visitors bureau," Altland said. "I'm privileged to continue this partnership and build on the successes of the complex for the benefit of the region and for all of Pennsylvania."

From **Penna. Agricultural Alliance Issues Update**, Penna. Farm Bureau, May 2015.

**Farmers Ask for Patience During Spring Planting**

With spring upon us, farmers have returned to the field to prepare for planting and getting the crops in the ground. That means moving equipment between farms and fields, and from one location to another. And while farmers understand the cyclical nature of their businesses, Pennsylvania Farm Bureau reminds the public each year about the return to planting with our Rural Roads Safety Week.

Each April, Pennsylvania Farm Bureau, along with several county Farm Bureaus, host events to encourage the public to be patient on roadways if they find themselves behind slow moving equipment. A little bit of patience, and some commonsense safety, will make sure everyone stays safe.

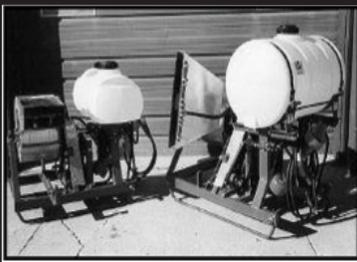
"Drivers need to keep their guard up throughout the planting, growing and harvesting seasons by reducing speed and being more aware of other motorists," said PFB President Rick Ebert. "We believe accidents can be prevented if farmers and motorists look out for one another on rural roads. If motorists hear our messages and follow safe driving tips, costly accidents can be avoided and lives can be saved."

Pennsylvania Farm Bureau hosted an event at a farm owned by Larry Voll in Butler County, highlighting that farmers are legally allowed to operate large equipment on roadways, but are cognizant that they may be slowing down other motorists. Farmers will pull over to let motorists pass at the first safe opportunity.

"We're urging motorists to use caution when approaching farm vehicles and be patient if they are delayed," said Voll, who is president of Butler County Farm Bureau.

Unfortunately, accidents still occur. Last year, there were 101 crashes and seven fatalities involving farm equipment in Pennsylvania, according to the Pennsylvania Department of Transportation. Overall, there were 51,676 crashes on rural roads statewide last year, with 762 fatalities.

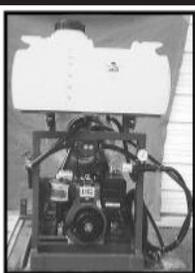
From **Penna. Agricultural Alliance Issues Update**, Penna. Farm Bureau, May 2015.



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## Mark Your Calendars – Monthly Grower Conference Calls

Last fall during the Pennsylvania Vegetable Marketing and Research Program's (PVMRP) vegetable research grower conference calls, it was suggested that we conduct periodic grower conference calls during the season to allow growers to talk about problems they are experiencing during the season – and hear recommendations from Penn State extension experts for solving them. Therefore, PVGA and PVMRP are working with Penn State Extension educators and specialists to conduct such a conference every four weeks during this summer and fall.

The calls will be on the following Tuesday evenings from 8:00 p.m. to 9:00 p.m.:

**June 16**  
**July 14**  
**August 11**  
**September 8**  
**October 6**

To participate in the calls, growers need to simply call toll-free 1-877-643-6951 and then enter pass code 55835024# at the scheduled time. All callers will be able to speak if they wish or they can just listen in on the discussion.

## Explorando el Sueño Agrícola

La Oficina de Extensión de Penn State está ofreciendo una nueva serie de grupos de discusión en español para los nuevos productores. Estas sesiones están disponibles sin costo gracias a un subsidio del PDA . ¡Bienvenida toda la familia! Penn State Extension is offering a new series of discussion groups in Spanish for new growers. These sessions are available at no fee with a grant from PDA. Families welcome!

The sessions will be held June 15, 2015, from 6:00 p.m. to 8:00 p.m. at the Easton Area Neighborhood Center at 902 Philadelphia Rd. in Easton.

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Para información adicional llame a Tianna DuPont, Penn State Extension Sustainable Agriculture 610-746-1970.

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The session will be in Spanish.

To register, please call Lexy 201-892-5511.

For additional information call Tianna DuPont, Penn State Extension Sustainable Agriculture 610-746-1970.

We hope these calls will become a valuable means for growers to ask questions about problems they are having in the field. It will also enable Penn State Extension educators and specialists to get information to growers across the state at the same time. So mark your calendars for these dates and plan to call in with your questions or just listen. Remember it is toll-free.



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## MARKETING

## Marketing to Millennials

Stan Ernst

Baby Boomers have controlled marketing culture, diets and food product development for, well, a generation or so. Those Americans born between 1946 and 1964 changed the food world in many ways with their interests in variety, convenience and healthy eating, with the money to make markets.

Produce growers benefitted from Boomer's year-round grocery expectations for fresh veggies and their development of related technologies and supply chains. Plus, there were various waves of specialty crop demand, produce-oriented diets, vegetarianism, immigration shifts and other Boomer trends that pushed produce expansion. They're still around. They're still spending. But if your marketing plan is based on Boomers, you might reconsider. Enter the Millennial Generation.

The Millennial Generation is hard to define. Harder to target. And they're the emerging market power. Millennials were born sometime between the early 1980s and the early 2000s, depending on who you ask, and are currently 42% of the U.S. population. In the next few years, they'll be over half the working population and control more than 1-in-3 retail dollars.

We've been talking about how cynical these consumers are ever since their spending power started showing up a decade or so ago. They don't believe advertising. They're not brand-conscious or loyal. Their food preferences are consistent, but they're big experimenters too. Millennials are starved for time and use technology to be more efficient. But they take time for what's important to them.

On the whole, I think Millennials will be good for the vegetable industry. They may have grown up on fast food, but 72% claim to enjoy cooking and want to learn how to cook more. Most surprising to some, these 20- and 30-somethings are preparing fresh food at home more than other age groups. They're the leaders of the fresh-and-less-processed food movement, with fresh produce a cornerstone. This is a generation that, because friends may be more important than family, seems to have rediscovered food-centered gatherings and experimentation. Because they especially like information technologies, Millennials are bound to share and promote whatever (and whoever) they're "into."

What's the catch? It's in the attitude... Millennials are often cynical and self-focused. They vote their favorite trends with their dollars (regardless of income), and can turn on you the minute you or your product doesn't suit them or what they think is important. And they tell their friends. This is the generation that has thoroughly embraced the blog, other social media, and food activism. Despite not being very brand-loyal in general, Millennials want "brand relationships" when it comes to fresh and local foods and other products they see as part of their lifestyle image. They respond to companies' cultural and lifestyle behaviors and likely base what brand loyalty they have on that.

Cynical, time-starved, a bit conflicted in their food preferences, and highly literate on technology are some traits worth considering in planning your produce marketing to this group. Five quick areas to start your thinking... Millennials (72%) like to cook and want to learn more about food preparation. That makes this group a great target for recipes and hands on cooking opportunities using your products. Whether you're a direct marketer or a wholesale producer teaming up with retailers, give this some thought. Teaming up with a local Extension professional, other educators, chefs, or youth organizations to do

public demonstrations using your primary crops or new crops you're bringing to market can appeal to millennials. You might be best off using demonstrators who can reflect their attitudes...and that might make demos a bit more edgy than we baby boomers are used to.

Keep in mind that this age group places high value on friends and grew up with more of a herd mentality thanks to group projects and other educational techniques of their era. Use that as you structure things. Introduce some unique produce to your market if it makes sense. Millennials tend to have a broad worldview, have traveled, and like to experiment with foods from different cultures. We've seen that with younger Baby Boomers too, hence the past interest in vegetables for Asian foods and the growing interest in ingredients for a number of South American cuisines.

Simple is best and transparency is essential. Millennials tend to be driving a number of eating trends related to methods of production. Whether they want "organic" or "local" or "paleo" or "conventional" or whatever, the bottom line is the same. These folks care about where their food comes from and how it's grown. Get ahead of the curve and tell your story before they ask.

I've had larger producers say things like "I'm too far removed from the consumer to do that" or "That's the retailers' job." I think you know better today. Make IT your tool. Remember, Millennials love computers, cellphones and other

*(continued on page 11)*

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MARKETING

**Marketing to Millennials** (continued from page 10)

information technologies. Many of you are using these to help with #3...telling your story. For larger growers, it's part of your fulfillment system. The challenge I have for you is to use these technologies in two-way communication if you're not. Get some quality feedback. Find out how consumers are using your produce. Maybe come up with some minor competitions aimed at educating and increasing the discussion. I know growers who get a lot of mileage out of simply sharing pictures of what's going on in their operation with a quick description of what they're doing and why.

Just giving customers an easy way to talk to you goes a long way toward tightening the relationship. Engaging them in a positive (for both sides) dialog can lock in loyalty. Millennials want that conversation... a "personal relationship with their farmer." And they'll spread the word – positive or negative – about how well that relationship with you/your product works.

Thicken your skin and learn some things. Remember those attitudes we said you might get from Millennials? Older growers might need to remind ourselves that these aren't our kids or kids from our generation. Millennials may speak directly and even sarcastically... it's not disrespect, it just is. They don't necessarily trust your word or the scientific experts you count on. You younger producers out there who have grown up in rural and farming America need to remember you're not the consumer norm either. As mad as some widely expressed consumer "beliefs" and attitudes may make you, don't take it personally even when it feels like an attack on everything you believe in by people who aren't out feeding the world.

Your job is to grow the best product you can, tell the full story about that product, and listen to what even the most obnoxious opponent of your product might say about it. I've worked with enough farmer-consumer conflict issues over the years to say that nearly all situations will benefit from showing how and why we do what we do, and continuing to answer and ask questions cordially. In fact, we all know farmers who have later benefited from criticism or wild ideas or even "insignificant" parts of a discussion with a customer. And sometimes we just agree to disagree.

Just like any group of customers, you won't be able to please all the Millennials. Yup, there a few extremists out there on many of the production issues that make the mainstream

media debates. But I usually find they're on BOTH sides of the issue. There are reasons for that... but that's a big discussion for another time. Keep growing.

*Mr. Ernst is a Business & Marketing Specialist/Ag Economist and Specialty Crops Business Program Manager with The Ohio State Univ. From the VegNet Newsletter, The Ohio State Univ., Vol 22, No. 3 and 4, May 4 and 18, 2015.*

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## NEWS

## Redding Confirmed For Secretary Post

Russell Redding received unanimous confirmation from the Pennsylvania Senate to serve as the next Secretary of Agriculture. Redding, a Farm Bureau member from Adams County, was nominated for the post earlier this year by Gov. Tom Wolf. He previously served as secretary and deputy secretary during Gov. Ed Rendell's administration. "It's an honor to again serve Pennsylvanians and the state's agriculture industry as secretary," said Redding. "I thank the members of the Senate not only for their vote of confidence in my guidance of this department, but also for their insightful conversations with me about how the department can best serve Pennsylvanians. That dialogue is important as



Russell Redding

we set out to meet the challenges and seize the opportunities present in agriculture today." Prior to returning to PDA, Redding was the dean of the School of Agricultural and Environmental Sciences at Delaware Valley College, now Delaware Valley University. Previous to his prior service at the Department, he was with Sen. Harris Wolford's office in Washington and the state Department of Labor and Industry.

From *Farm Bureau Express*, Penna. Farm Bureau, May 22, 2015. Picture from Penna. Department of Agriculture.

## Cotner and Hoffman Elected PSU Ag Trustees

Pennsylvania's agriculture associations selected Chris Hoffman, Pennsylvania Farm Bureau's vice president, and Donald Cotner to serve on the Penn State Board of Trustees. In addition, Julie Anna Potts, executive vice president and treasurer of the American Farm Bureau Federation, has been elected to serve a three-year term as an at-large trustee.

Hoffman will serve his first three-year term on the board while Cotner was elected to his second term as a trustee. A total of six members, plus the Pennsylvania Secretary of Agriculture, represent agriculture on Penn State's governing board.

Hoffman owns Lazy Hog Farms in Juniata County, where he manages several hog barns. He also raises 47,000 chickens. In 2013, Hoffman was selected to lead a new committee within Farm Bureau-the Agriculture Promotion Committee-which encourages local programs that engage consumers with agriculture, and also raises money for the Friends of Agriculture Foundation.

Since 1971, Cotner has operated Don Cotner Farms, a 1,250-acre corn and soybean farm and poultry feed manufacturing facility. The farm operates as a partnership with three children. Cotner is also president of Cotner Farms, Inc., a 410,000 layer egg production, packaging and distribution facility and markets them independently in a three-state area. Cotner is a Farm Bureau member and has served as a director for AgChoice Farm Credit since 1999. Potts is responsible for the day-to-day operations of the American Farm Bureau Federation including the financial management and oversight of the organization.

From *Farm Bureau Express*, Penna. Farm Bureau, May 22, 2015. Picture from Penna. Department of Agriculture.



Chris Hoffman



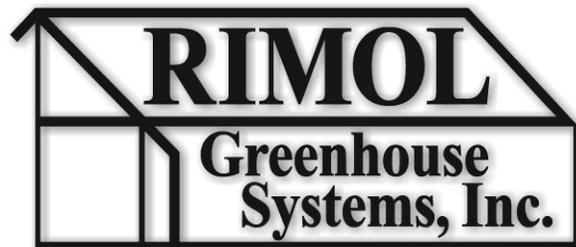
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GENERAL

# Dillner Farm Brings Family and Community Together



"I enjoy working closely with my husband and our four children on our farm," said Jane Dillner. "It really brings our whole family together."

The Dillners produce a wide variety of vegetables and a few varieties of fruits, using sustainable agricultural methods.

"Sustainability is an important part of our farm," said Jane. "We take pride in our farming methods and try to educate people about where their food comes from."

The family's farm is open every spring for guided tours of their facilities, which include a CSA room, a barn and eight greenhouses.

In addition to managing their own stand on their farm throughout the summer months The Dillners take their farm-fresh produce and participate in numerous weekly farmers' markets in the Pittsburgh area. The family is also involved in the Community Supported Agriculture (CSA) program, providing shareholders in Allegheny with fresh produce every week.

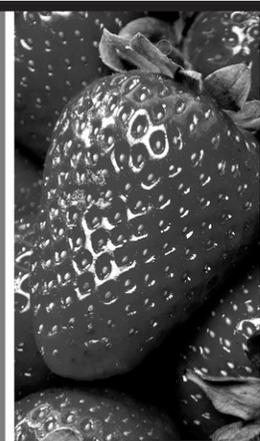
"We are proud to say that we have been participating in farmers' markets for about 20 years as well as our CSA program for over 10 years," said Jane.

Family farming has played an important role in Pennsylvania agriculture since the early days of the commonwealth. The Dillner Family Farm, located in Gibsonia, Allegheny County, is in its third generation of family-owned operation. The farm is currently under the operation of Donald and Jane Dillner with the help of their four children, Jonathan, Justin, Marie and Joseph.

The Dillners have purchased additional farmland in Butler County, looking to expand their fruit and vegetable production in the future years. They also hope to add more greenhouses to their farm, with the help of their eldest son, a recent graduate of Penn State University with a degree in horticulture.



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## VEGETABLE PRODUCTION

## Biodegradable Plastic Mulches

Elsa Sánchez



Biodegradable plastic mulch used on a Pennsylvania farm.

Biodegradable plastic mulches (biodegradable mulches) are an alternative to polyethylene plastic mulches (plastic mulches) which are widely used in vegetable production. Ideally they provide the same benefits for growing crops as plastic mulches with the added benefit of completely breaking down from native soil microorganisms. The mulch remaining at the end of the growing season can be tilled into the soil or composted.

Biodegradable mulches have been available since the 1980s, but they are not widely used. Recently, through a survey and focus groups, commercial growers, agricultural educators and industry members were asked what the bridges or barriers to adoption of biodegradable mulches are (Goldberger, Jones, Miles, Wallace and Inglis. 2015. Barriers and bridges to the adoption of biodegradable plastic mulches for US specialty crop production. Renewable Agriculture and Food Systems 30(2):143-153.).

Bridges or opportunities identified were:

- waste reduction because the mulch biodegrades,
- environmental benefits of not using petroleum-based mulch including disposal issues, and
- a desire to learn more about biodegradable mulches.

Barriers included:

- insufficient knowledge of their long-term use,
- a perceived high cost which is not off-set by use of these mulches, and
- unpredictable breakdown.

To address these barriers, a group of 22 researchers and extension specialists from Washington State and Montana State Universities and the University of Tennessee are conducting research trials.

Since the rate of degradation of biodegradable mulches is highly dependent on their composition and the environment, the group is studying the breakdown of several biodegradable mulches over a 5-year project in Washington, Tennessee and Montana in the field and laboratory. They will investigate how the mulches affect crop production including weed populations, diseases and insect pests. They will also study the effects of the mulch as it breaks down on soil ecology.

Some evidence shows that even though biodegradable mulches cost more than plastic mulches, they may be cheaper to use when factoring in the cost of removal and disposal of the plastic mulch. The project team will conduct an economic analy-

sis to compare biodegradable mulches and plastic mulches including costs for retrieval and disposal.

A website has been developed as part of the project which currently includes a glossary of terms for biodegradable mulches as well as “biobased mulch”, “biodegradable mulch” and “bioplastics” among many other terms.



(continued on page 18)

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## Onion, Seed Corn, and Cabbage Maggots

Tianna DuPont and Shelby Fleischer

These maggots attack seeds and small seedlings. While cabbage maggot and onion maggot attack only the seeds and seedlings of their namesakes, seed corn maggot will attack many plant species. Peak flight for the first generation of seed corn maggot was May 2nd in SE PA. Maggots have been confirmed in three fields in Adams, Lehigh and Lancaster Counties. Cabbage maggot is at 25% emergence and onion maggot is not out yet.



Cabbage, onion, or seed corn maggot – are they all the same right? - When you see little wrigglers in your plant roots it is disheartening and you might not care which maggots are causing the problem. In general you are right. A maggot is a maggot. But there are a few differences that may make it worth figuring out which problem you have. Cabbage and onion maggot stick to their namesakes. Cabbage maggot attacks all mustard family crops (cabbage, broccoli, mustards, turnips, as well

as weedy crucifers) and onion maggot attacks alliums. When overwintering pupae emerge as adult flies they look for their host and lay their eggs at the base of the plant. Cultural controls such as rotation and floating row cover may work for cabbage and onion maggot. In contrast seed corn maggot has a wide host range and seems to be attracted to freshly turned organic matter. Seed corn maggots might already be there waiting when you transplant. Historically we have seen significant damage from seed corn maggot in sweet corn and beans planted from seed, and muskmelon placed in the ground as transplants.

Is your planting at risk? - Monitoring: Check to see if the adult flies are in your field. They look like houseflies, but about  
(continued on page 18)

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## VEGETABLE PRODUCTION

### **Onion, Seed Corn...** (continued from page 17)

one-third the size of houseflies. The flies are much easier to identify and monitor than the eggs or maggots. Flies are attracted to bright yellow colors. Yellow sticky cards (3X5 inches) are inexpensive and easy to use; you can purchase small wire stakes made for this purpose, or clip to a wooden stake. Place near the soil. Check and change traps twice weekly to record changes in fly activity. Leaving them for a whole week usually results in a card and flies covered with blown soil, and is a less accurate measure of flight activity (sources: Great Lakes IPM, Gemplers). Yellow pan traps filled with water and a drop of soap also work.

Using Growing Degree Days: The beginning and peak of each fly generation can be identified using Growing Degree Day (GDD) accumulations. To check for ongoing GDD updates, visit the Northeast Network for Environment and Weather Applications (NEWA) <http://newa.cornell.edu/>. Choose a monitoring location near you and the appropriate crop. You can also see a map of base 50 GDD in Pennsylvania at <http://papipe.zedxinc.com/map/>. Compare your local GDD to projected flights (NEWA & below). For example peak flight for seed corn maggot is 360 GDD (base 40 F) [1].

### **Controls**

Wait for green material to decay. If you are incorporating green cover crop let it sit as long as possible. That way the maggots can feed on the green material first.

Row cover can exclude the flies. But if the problem is corn seed maggot, they might already be there feeding on decaying organic material. Use in a rotated field, as flies overwinter in soil.

Avoiding damage by later planting. The first flight and egg-laying period is generally the most intense. After the first flight is over, and as soils heat up, perhaps fewer eggs are laid and those that are laid are less likely to survive. Also, plants that are growing rapidly, in warm soils, have a much better chance of out-growing feeding. You may want to watch the growing degree days and wait to transplant till the first flight has peaked. This is often later than optimal planting time. [2]

### **Biodegradable...** (continued from page 16)

The website <https://ag.tennessee.edu/biodegradablemulch> has been created for information on biodegradable plastic mulches for crop production.

The site also has fact sheets on biodegradable mulch including one on their use in organic production systems. In 2012, the National Organic Standards Board passed a motion allowing the use of 'biodegradable biobased mulch film' providing that the mulch is 'produced without organisms or feedstocks derived from excluded methods' and meet certain degradation standards (at least 90% degraded in 2 years or less). At present, no biodegradable mulch has been approved.

The project is a continuation of work done by researchers and extension specialists at Washington State University, Texas A&M University and the University of Tennessee using biodegradable mulches in high tunnels. You can read results of that project at their website.

*Dr. Sánchez is with the Department of Plant Science at Penn State Univ. From the Vegetable, Small Fruit and Mushroom News, Penn State Extension, <http://extension.psu.edu/vegetable-fruit>, April 24, 2015.*

Monitoring cabbage for eggs. If you have transplants hardening off in a cold frame or outdoors, flies may find them and lay eggs in the flats. To check for eggs in the field or in flats, look for the 1/8-inch long, torpedo-shaped white eggs that are laid along the stem, or on the soil next to the stem of young transplants. Often eggs are laid in neat rows, or inserted into the soil. They may be under a small clod of dirt near the stem. A pencil point or knife helps stir the soil to look for them. A reliable field scouting method is to check 25 or more plants, in groups of 2-5 plants, scattered around the field. If you find an average of 1 egg/stem or more, it is likely to be a damaging population and a banded soil drench is recommended. Eggs may be more abundant in wetter areas of the field. Egg numbers may build up rapidly after the first eggs are seen [3].

Soil Drench. Check the Commercial Vegetable Production Guide (<http://extension.psu.edu/vegetable-fruit/production-guides>) for products labeled for the crop you are working with. Note Lorsban has documented resistance in many fields in New York according to Dr Brian Nault, Cornell. As a foliar Lorsban is labeled but often has low efficacy according to Nault.

For organic growers there has been some efficacy using spinosad products. Entrust and Seduce are possibilities as an in furrow soil drench at planting or a transplant dip.

If a planting is already infected typically treatment will not be affected.

Nematodes for biological control. One alternative method that has shown promise but has not been widely field-tested is soil application of entomopathogenic nematodes, especially *Steinernema feltiae* [4, 5]. It is important to match the life history of the nematode with the pest. For example *Steinernema feltiae* are "cruzer foragers" says UC Davis nematologist Amanda Hodson. They forage right at or below the surface, unlike other nematodes that will stay on the soil surface. Hodson recommends applying infective juveniles in the irrigation (drip or microsprinklers). "Apply them in the morning and evening when it is not too hot and irrigate to keep soil moist," she says. Another common method is application to transplants before planting or in the water wheel transplanter. Carol Glenister at IPM Laboratories cautions that "the nematodes die in sunlight within 30 minutes, so need to be trenched or washed down into the soil." They have had over a than a decade of satisfaction using *Steinernema feltiae* on cabbage maggot. Due to similar biology corn seed maggot may also be controlled. But her customers have not had success on onion maggot. They recommend 25 million infective juveniles for a transplant dip (@200 trays) with perhaps another 25 million in the water wheel transplanter. Rates of 100,000 to 125,000 infective juveniles per transplant have been shown to be needed to achieve reduction in damage.

For more information, see these websites:

Seed Corn Maggot factsheet - <http://ento.psu.edu/extension/factsheets/seedcorn-maggot>

Cabbage Maggot Factsheet - <http://ento.psu.edu/extension/factsheets/cabbage-maggot>

UMass Pest Alert Maggot Flies - <http://extension.umass.edu/vegetable/alerts/pest-alert-emergence-spring-maggot-flies-approaching>

UMass Corn Seed Maggot and Wireworm - <http://extension.umass.edu/vegetable/sites/vegetable/files/Seedcorn%20Maggot%20&%20Wireworm%202012.pdf>

Seed Corn Maggot GDD- [http://www.soils.wisc.edu/uwex\\_agwx/thermal\\_models/scm](http://www.soils.wisc.edu/uwex_agwx/thermal_models/scm). (continued on page 19)

**VEGETABLE PRODUCTION**

**Onion, Seed Corn...** (continued from page 18)

Comparison of peak flights (GDD base 40 F)

Generation	Seed corn	Onion	Cabbage
1st Peak	360	450-540	450

Flight Peak	Accumulated Degree Days
1st Peak	700
2nd Peak	1960
3rd Peak	3240

Onion Maggot Flight Peaks

Based on Growing Degree Days base 40 F. From NEWA.

Cabbage Maggot Flights  
(Model by: J.L. Jyoiti and A.M. Shelton) converted to Fahrenheit Stage

Stage	Accumulated Degree Days		
1st Emergence	288	+/-	15
25 percent	366	+/-	5
50 percent	452	+/-	14
75 percent	547	+/-	66
95 percent	697	+/-	14
Overwintering generation	809	+/-	3

After completion of spring emergence, accumulated degree days need to be reset to zero. Degree days necessary to complete F1, F2 and F3 generations are shown below. After each generation, the accumulated degree days need to be reset to zero.

Generation	Accumulated Degree Days		
F1	915	+/-	59
F2	838	+/-	38
F3	718	+/-	6

Based on Growing Degree Days base 40 F. From NEWA.

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Ms. DuPont is with Penn State Extension and Dr. Fleischer is with the Department of Entomology at Penn State Univ. From the *Vegetable. Small Fruit and Mushroom News, Penn State Extension*, <http://extension.psu.edu/vegetable-fruit>, April 18, 2015.

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## VEGETABLE PRODUCTION

## Striped Cucumber Beetles

James Jasinski and Celeste Welty

One of the key early season insect pests of cucurbits (squash, pickles, pumpkin, melons) is the Striped Cucumber beetle, *Acalymma vittatum* (Fig 1.). This beetle can inflict severe feeding injury to seedling plants, especially to the cotyledons, and needs to be monitored closely the first few weeks after seedlings emerge in the field. Feeding damage also allows for possible transmission of bacterial wilt (*Erwinia tracheiphila*) into the plant, which is a systemic infection that will stunt or kill the plant, yielding no fruit. Once a plant has bacterial wilt, there is no rescue treatment.

Scouting for this beetle requires that 100 seedling plants total are surveyed at random locations in the field every few days, and if an average of more than 0.5 beetle per plant is found, then treatment is justified. For a selection of foliar insecticides to control this pest, consult the Midwest Vegetable Production Guide chapter on cucurbits, pg. 114 ([http://mwveg-guide.org/94\\_Cucurbits.pdf](http://mwveg-guide.org/94_Cucurbits.pdf)). Once plants are past the 4-leaf stage, the action threshold is increased to 1 beetle per plant.

Another option for control of Striped Cucumber beetle is the use of a systemic insecticide as a commercial seed treatment, or as an in-furrow application at planting for direct-seeded crops, or as a pre-transplant plug drench, or as an at transplant drench (Fig. 2). These systemic insecticides (chemical group: Neonicotinoids) essentially leach off of the seed coat or are absorbed in-furrow by the plant roots and are circulated throughout the plant to protect against insect feeding. As the plants get larger, the relative concentration in the plant decreases and the protection against feeding pests decreases to the point of being ineffective. These insecticides also end up in pollen and nectar collected by pollinators in very small but measurable quantities, to which much research has been conducted to determine any lethal or sublethal effects. In general, research has shown a lower concentration of insecticide can be detected in pollen and nectar when using seed treatment versus in-furrow application.

Based on studies conducted at Ohio State and other locations, systemic insecticide seed treatment on direct-seeded crops provides good control of striped cucumber beetles for 2 to 3 weeks after plant emergence compared to 4-6 weeks of control using a full rate systemic insecticide in-furrow at planting. We do not recommend insecticide seed treatment for transplanted crops because it is protecting plants while they are in the greenhouse, where they do not need protection.

Most growers have purchased their seed for this year's crop by now so their options for insecticide seed treatment, in-furrow application at planting, or scouting seedlings as



Figure 1. Striped Cucumber beetle adult.



Figure 2. Pumpkin seedling treated with systemic insecticide; note all the dead Striped Cucumber beetle adults at base of seedling Photos by Jim Jasinski

they emerge has likely been made, but still it's important to review all the options available. We will continue to write more about what is known about the effects of Neonicotinoids on pollinators in future articles.

Mr. Jasinski is with the IPM Program and Ms. Welty is with the Department of Entomology at The Ohio State Univ. From the *VegNet Newsletter*, The Ohio State Univ., Vol. 22, No. 4, May 18, 2015.

## Black Cutworm Update

John Tooker

Penn State Extension's Black Cutworm Monitoring Network has now detected six significant flights of this migratory pest species across the state. Black cutworms are a bit more active than usual this year; thus, growers generally need to be aware of this situation and watch your fields as the spring progresses.

Reports from Kentucky, Indiana, and Illinois indicate that black cutworms are a bit more active than usual this year; thus, growers generally need to be aware of this situation and watch your fields as the spring progresses.

Not to be outdone, Penn State Extension's Black Cutworm Monitoring Network has now detected six significant flights of this migratory pest species across the state. These significant flights (eight or more moths over the course of two nights) are associated with an elevated risk in that particular area of cutting damage by caterpillars later in the spring. We reported two of these significant flights two weeks ago (one in Berks County [near Kutztown], one in western Union County [near Millmont]). The four new flights have been detected in: eastern Centre County (near Woodward), Franklin County (near Chambersburg), McKean County (near Port Allegany), and Potter County (near Coudersport). Degree-day accumulations at these sites range from about 100 in Berks down to around 30 in McKean County. As we approach 300 degree days following the flights, we will notify folks, that is when it will be time to scout fields for cutting damage. While some Bt varieties can slow down black cutworm, Rescue treatments are usually the most efficient and economical tactic for managing black cutworm. For more information, see our factsheet.

Mr. Tooker is with the Department of Entomology at Penn State Univ. From the *Vegetable, Small Fruit and Mushroom News*, Penn State Extension, <http://extension.psu.edu/vegetable-fruit>, May 5, 2014.

# Strip Tillage in Vegetable Production – Recent Experiences, New Study

Zheng Wang

In strip tillage, only the area to be planted is disturbed, between-row areas are not. Tilling only a small portion of the total field offers the benefits of both traditional and conservation tillage. Strip tillage is most common in agronomic crop production and its benefits in those systems have included maintenance of grain yield and soil moisture and structure. Strip tillage has also limited tractor fuel consumption. The success of strip tillage in mic systems has made people ask if it can be achieved in vegetable systems. The question does not appear to have been tested as widely in Ohio as in other locations. Still, Ohio growers can learn from experience gained elsewhere and they will soon have home-grown data, also. My research at The University of Kentucky involved comparing a strip-tillage approach to one using standard raised beds covered with plastic mulch. I grew bell peppers both ways (strip till, standard raised beds) and also included organic and conventional, and well-watered and water-restricted versions of each system. The previous crop in all plots was either hairy vetch/winter rye or just winter rye, and each cover crop was incorporated into the soil before strip tilling or setting up plastic-covered raised beds. Bell pepper plants were transplanted in double rows on each plastic-covered bed but in a single row in strip-tilled plots. All plots were drip-irrigated at different regimes to maintain optimal soil moisture or to create drought stress. Fruit yield by number and weight were measured. Strip tillage led to higher yield in organic plots but lower yield in conventional ones. Also, among the multiple harvests, time to the largest one was delayed in strip-till plots. Overall, peppers grown in strip tillage used less water for irrigation than those in plastic mulch. Strip tillage also helped soil maintain higher moisture throughout crop growth. This experience indicates that tillage system (strip versus standard) should be chosen carefully based on soil, farm and crop effects. The Ohio Vegetable & Small Fruit Research & Development Program (OVSRDP) recently provided support for related work to be completed in Ohio in 2015. Experimental plots will be established at OARDC in Wooster soon. Check VegNet and <http://hcs.osu.edu/vpslab> and <http://www.facebook.com/osuvpslab> for project updates or contact me ([wang.2735@osu.edu](mailto:wang.2735@osu.edu)),

Dr. Matt Kleinhenz ([kleinhenz.1@osu.edu](mailto:kleinhenz.1@osu.edu)), or Jennifer Moyseenko ([moyseenko.2@osu.edu](mailto:moyseenko.2@osu.edu)) for more information.

*Dr. Wang is with the Department of Horticulture and Crop Science at The Ohio State Univ. From the VegNet Newsletter, The Ohio State Univ., Vol. 22, No. 2, April 20, 2015.*

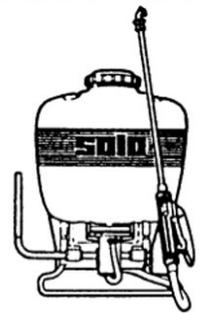
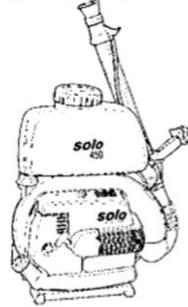
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## Command Label Changes

Mark VanGessel

Recently the label for Command herbicide was changed, limiting use in some vegetable crops important to Delaware and the region. Under the category of succulent beans, only snap beans now are listed. Residue tolerances for lima beans have not been established, so usage for lima beans were removed from the label. This impacts the use of Command as a soil-applied herbicide for lima beans, as well as use in preceding crops. Since lima beans do not have a tolerance, there is a 9 month rotation between application and planting lima beans.

*Dr. VanGessel is with the Univ. of Delaware. From the Weekly Crop Update, Univ. of Delaware, Vol. 23, No. 7, May 8, 2015.*



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## VEGETABLE PRODUCTION

### Transplant Losses

Gordon Johnson

A number of fields have had issues with poor plant performance and plant losses after transplanting in the last 10 days. Transplant shock is most prevalent when there are cold, windy conditions after transplanting and when night temperatures drop below 50°F. Plant and planting conditions that increase the risk of plant shock include:

**Poor hardening off.** Plants that come directly out of greenhouses or that have just recently come out of houses are most at risk. A proper hardening off will include reducing fertilizer and water and exposing plants to outside conditions in a protected area. It takes a minimum of 5 days to harden off plants.

**Different plant maturities.** Younger plants are more susceptible to shock. In watermelons, pollenizers are often younger than seedless due to having more rapid growth. Pollenizers are often most susceptible to plant shock after transplanting.

**Small root systems.** Plants grown in small cell sizes have fewer roots and if rooting conditions after transplanting are not favorable, they will be at a higher risk of shock than plants with larger root systems.

**Root bound plants.** An opposite problem can occur where plants have been in trays too long and roots have become root bound. Root bound plants dry out more quickly and often do not send out new roots as quickly because many roots in the root ball have died or are growing in circles in the cell.

**Root systems not fully formed.** In cells of plant trays, if the plant has not produced sufficient roots, it will not pull out of the tray properly and roots will be damaged when extracting plants and plants will be more susceptible to shock.

**Rough handling during transplanting.** If transplant crews damage plants when pulling out of trays and when setting

plants, there will be increased plant shock. This includes stem crushing or damaging roots when extracting plants.

**Setting plants too low or too high.** In the transplanting process, burying plants too deep where green stem or leaf tissue is below ground can lead to that tissue being exposed to rotting organisms. Conversely, if root systems exposed (set too high), they can dry out and cause plant loss.

**Inadequate plant water.** If there is inadequate water at transplanting, plants can dry out and losses can occur.

**Too much fertilizer.** Too much fertilizer in the transplant water or in beds near the plant can cause salt injury and plant losses.

**Poor plant handling.** Keeping plants in tight conditions such as plant trucks for long periods of time, in extreme heat conditions, or where they have no light for an extended period will weaken plants and when exposed to the direct sunlight after transplanting, losses can occur. Plants shipped in that have been in transit too long or where truck conditions were stressful (cold or hot) will have more risk of shock. Plants that have dried out before transplanting are also at risk.

**Diseased plants.** Plants that come out of greenhouses or hardening off areas with stem or root infections from disease organisms such as Pythium will be susceptible to losses in the field when planted.

*Dr. Johnson is Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware, Vol. 23, Issue 7, May 8, 2015.*

### Controlled Release Fertilizer Products in Vegetable Crops

Gordon Johnson

There has been considerable work on controlled release fertilizer over the years and many of the different technologies have shown potential for use with vegetable crops. Controlled released fertilizer is most useful with nutrients that are subject to leaching losses, particularly nitrogen.

Controlled release fertilizers are most commonly based on coatings (polymer or sulfur coated ureas for example) or having nutrients in chemical forms that slow their release (Ureaform and IBDU nitrogen for example). Polymer coatings can be used on most fertilizers and are common in the nursery and greenhouse industries with complete fertilizer products applied to potted plants. Coated product technologies have advanced over the years to give more precise release properties. However, release will still be dependent on the type of coating, the thickness of the coating, as well as temperature and moisture. Controlled release fertilizers are commonly rated as to how long they take to release nutrients in days (70 day, 90 day, 120 day formulations for example). They can also be mixed with a small amount of regular soluble fertilizer to give an initial nutrient charge.

It should be noted that manures have a component of their nitrogen (the organic fraction) that is available upon decomposition and mineralization so they can be considered a slow release fertilizer.

One main advantage of controlled release fertilizers is that only one application is necessary for a crop, thus reducing application and management costs. The other main advantage

is reducing nitrogen leaching losses because not all nitrogen is available at once. In some trials, efficiency of nitrogen utilization is improved (by reducing losses) so that less nitrogen is needed.

For many years, the cost of controlled release fertilizers limited their use to high value horticulture applications. As costs are decreasing, especially with the polymer coated products, the economics is changing for vegetable and field crops.

*Dr. Johnson is Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware, Vol. 23, No. 4, April 17, 2015.*



# Managing Vegetable Diseases in the High Tunnel

Kate Everts

Production of vegetables in the high tunnel requires a different approach to disease management than field production. Reducing diseases in protected environments is made easier because rainfall on the foliage can be eliminated. However, high tunnel environments tend to be wind free and prone to high humidity. High humidity and low light intensity promote disease and are problems when the sides cannot be raised, or when days are rainy. Cool temperatures, which are common during spring high tunnel production, encourage *Botrytis* and *Sclerotinia* on tomatoes. Reducing humidity is critical to reducing disease. The main method to improve air movement is raising the high tunnel sides, which will also lower the temperature of the foliage because transpiration increases.

Sanitation is important and growers should scout plants regularly and discard plants that show signs of disease. In addition, elimination of cull piles outside the high tunnel is also important. Sanitation is especially critical for diseases where the rate of increase is low (such as *Fusarium* wilt or nematodes) because it has a greater impact than for diseases with short life cycles that increase exponentially (such as late blight or powdery mildew).

Another way to reduce initial inoculum is to use sterile or disease free soil or soilless mixes. Take care in preparing mixes so that pathogens are not introduced. In the case of ground beds, soil should be sterilized. Once the sterilization is conducted, special care should be used in replanting so that diseases are not reintroduced into an environment where few organisms (and therefore little competition) exist.

Elimination of all inoculum sources is difficult because some pathogens survive in soil (such as sclerotia of *S. sclerotiorum* or *S. rolfsii*). Bacteria survive on crop debris and on twine, stakes, and wire. Because all inoculum sources cannot be eliminated, measures should be taken to minimize the presence of disease. Use Greenshield or other disinfectant to clean tools, stakes, and benches.

Composts, while not sterile, may be suppressive to disease development. For example some hardwood bark composts are suppressive to *Phytophthora*. However, care must be taken with the source of the compost and be wary of unverified claims of suppression. Some composts increase diseases.

Some ornamental plants can harbor diseases, so avoid having ornamental plants in the vegetable production greenhouse. Pathogens are easily spread through the activities of people, on hands, clothing, and tools. Watering can also spread pathogens. Drip tape or watering at the base of plants, will reduce moisture on the leaves and splash dispersal of pathogens.

Finally fungicides and biorational pesticides are often used on high tunnel vegetables. The following is a link to a table of some selected products that are registered for use in the USA for greenhouse vegetable production ([http://extension.umd.edu/sites/default/files/\\_docs/PesticidesGH\\_Vegetables.pdf](http://extension.umd.edu/sites/default/files/_docs/PesticidesGH_Vegetables.pdf)). If possible these products should be used in high tunnel production because they have been tested in protected environments. If you roll up the sides of the greenhouse prior to application of fungicides, there are additional options, but avoid fungicides that are prohibited for greenhouse use.

*Dr. Everts is the Vegetable Pathologist with the University of Delaware and University of Maryland. From the Weekly Crop Update, Univ. of Delaware, Vol. 23, Issue 8, May 15, 2015.*

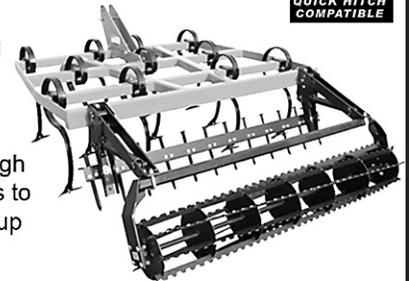
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## POTATO PRODUCTION

## Uncommonly Challenging Common Scab

Amanda J. Gevens and Bryan J. Webster

Potato producers worldwide face challenges with control of common scab, a disease caused by soil borne bacteria that reduces crop quality and, at times, yield. Potato tubers with extensive scab lesions are often unmarketable and are typically rejected across multiple markets including fresh, seed, and processing.

The economic impact of potato common scab in the U.S. is not well documented; however, yield losses due to this disease are likely in the tens of millions annually. Although often a highly variable disease concern from year-to-year, common scab has become increasingly troublesome to Wisconsin and Upper Midwestern producers due to the limited efficacy of cultural and chemical control options.

The unmistakable and highly anticipated smell of freshly turned soil in the spring comes from two small molecules, geosmin and 2-methylisoborneol, which are mostly produced by *Streptomyces* bacteria. Of this richly smelling genus, just a small number of species can cause common scab on potato tubers, and tap roots of radish, parsnip, carrot and beet.

*Streptomyces scabies* has long been considered the primary causal species affecting potato, but recent genotyping from our Wisconsin research has revealed multiple potato-disease-causing species including *Streptomyces stelliscabiei*, *europascabiei* and *glauconiger*. Many factors influence infection and severity of common scab symptoms including diversity of soil microbial populations, soil pH, temperature and soil moisture.

Potato tubers develop common scab during the tuber initiation phase and symptoms develop into three distinct lesion types at maturity: 1) russeted superficial lesions, 2) raised corky patches that are erumpent, and 3) pitted scabs that can vary from shallow to deep pits.

It remains unclear as to what factors decisively influence lesion type - cultivar, pathogen species, soil type or other agroecological factors. However, some of our recent work suggests an association with pathogen species. Management strategies have included use of cultivar resistance, crop rotation, management of water during tuberization (low moisture promotes disease), management of soil pH to <math>< 5.2</math>, and pesticides. However, even combined, these approaches often provide inconsistent control of common scab.

Over the past several decades, growers and researchers have explored pesticide management programs for management of common scab. Control results are typically highly variable for most pesticides. However, pentachloronitrobenzene (PCNB) fungicide and chloropicrin fumigant have provided some of the most consistent, and repeated positive results in problematic fields with susceptible cultivars.

In just the past 6 years, here in Wisconsin, my program has evaluated over 30 conventional and organic pesticide inputs for common scab control. The materials we have tested can be categorized as conventional fungicide and fumigants, and biopesticides.

I have included a table, which summarizes our trial work and general common scab results. Please be mindful that this work was conducted in a single common scab disease nursery at the Langlade County Extension Airport Research Station on 'Yukon Gold' potatoes.

Pentachloronitrobenzene, or PCNB (Blocker™), applied as a pre-plant soil treatment, and chloropicrin, applied as a soil fumi-

gant prior to planting, have both resulted in good and consistent common scab control across trial replications and across years. Serenade Soil and Quadris . resulted in good, but inconsistent common scab control results over the 6 years of testing.

While the microbial biopesticides contain beneficial microorganisms that can inhabit the soil and have been shown to provide some common scab reduction in controlled environments, these materials were highly variable in control performance in our multiple years of trialing.

As we look ahead to other disease concerns for potato production in 2015, let us first consider the resulting effects of this long, cold winter. While it is likely that a high percentage of our above ground debris-borne plant pathogens froze to death if snow cover was limited on open fields, the pathogens that live beneath the soil surface and have specialized protective fungal structures for long-term survival may have survived just fine. Remember that many of our most persistent soil borne pathogens are adept at surviving winters in northern climates, including *Streptomyces* species.

Fungicide seed treatments, in-furrow pesticide application, and fungicide/ fumigant soil incorporants can have a place in an integrated disease management plan which includes cultural practices such as planting certified potato seed to aid in minimizing disease levels and proper handling and sanitation of storage/ cutting/curing facilities prior to planting, and cultivar resistance.

In combination, integrated practices minimize economic losses to disease, minimize environmental effects, limit risk of pesticide residues, limit development of fungicide-resistant pathogen strains and limit development of pathogen strains, which may overcome host disease resistance.

For further information on potato disease management and fungicides, please refer to the following sources. Our Potato & Vegetable Pathology Website can be sourced at <http://www.plantpath.wisc.edu/wivegdis/>. The 2015 A3422 Commercial Vegetable Production in Wisconsin guide is available for purchase through the University of Wisconsin Extension Learning Store website: <http://learningstore.uwex.edu/Search.aspx?k=A3422>. In addition, a pdf of the document can be downloaded or is available at the following direct link: <http://learningstore.uwex.edu/assets/pdfs/A3422.PDF> [Pennsylvania information is available in the 2015 Commercial Vegetable Production Recommendations available from local extension offices or online at <http://extension.psu.edu/publications/agrs-028>.]

Summary, on page 25, of potato common scab control trial results from 2009 to 2014 on 'Yukon Gold' in Antigo, WI. Gevens, A.J.; Potato & Vegetable Pathology, UW-Madison; [gevens@wisc.edu](mailto:gevens@wisc.edu)

Dr. Gevens and Mr. Webster are with the Department of Plant Pathology at the Univ. of Wisconsin-Madison. From the **Badger Common Tater**, Wisconsin Potato and Vegetable Growers Association, Vol. 67, No. 4, April 2015.

(continued on page 25)


**POTATO PRODUCTION**
**Uncommonly Challenging...** (continued from page 24)**Common Scab Control Trial Results from 2009 to 2014 on 'Yukon Gold' in Antigo, WI**

Treatment	Active Ingredient	Application Rate/Acre	Time of Application	2009	2010	2011	2012	2013	2014	General Comment on Efficacy
Untreated control	N/A	N/A	N/A	X	X	X	X	X	X	NA
Colonize	mycorrhizal inoculant	2.0 oz	At-plant	X	X					Poor
Colonize + Messenger	mycorrhizal inoculant + harpin protein	2.0 oz + 3.0 oz	At-plant	X	X					Poor
Agzyme	bio-stimulant and foliar nutrients	12.8 oz	At-plant	X						Poor
Serenade Soil 1.34%	Bacillus subtilis strain 713	32.3 fl oz/113 fl oz/194 fl oz	At-plant		X	X			X	Good – highly variable
Quadris Flowable 2F	azoxystrobin	11.7 fl oz	At-plant		X	X	X	X	X	Good – highly variable
MycoApply	mycorrhizae		At-plant		X					Poor
Quash 50WDG	metconazole	2.0 fl oz/4.0 fl oz	At-plant		X					Poor
Untreated control – No fumigation	N/A	N/A	N/A			X				Poor
Vapam	metam sodium	40.0 lb	Fall prior			X	X	X	X	Poor
Blocker 4F	pentachloronitrobenzene (PCNB)	10.0 pt	At-plant			X	X	X	X	Good
Blocker 4F + Mocap 15G	PCNB + ethoprop (15%)	10.0 pt + 20.5 lb	At-plant			X				Good
Mocap 15G	ethoprop (15%)	20.5 lb	At-plant			X				Good
Blocker 4F + Rejuvenate	PCNB + naphthalenic acid (NAA)	10.0 pt + 0.33 oz	At-plant			X	X	X	X	Good
Rejuvenate	naphthalenic acid (NAA)	0.33 oz	Seed trt					X	X	Good – highly variable
Blocker + Serenade Soil	PCNB + Bacillus subtilis	5 pt + 4.4 oz	At-plant				X	X	X	Good – highly variable
Tiger-Sul 90CR	elemental sulfur	1000 lb	At-plant			X	X	X		Poor
Regalia SC	Reynoutria sachalinensis extract	29.3 fl oz	At-plant			X	X			Poor
Regalia SSC	Reynoutria sachalinensis extract	0.5 fl oz	At-plant					X		Poor – low disease pressure
Regalia SSC	Reynoutria sachalinensis extract	4.0 fl oz	At-plant					X	X	Poor – low disease pressure
Pic Plus	chloropicrin (85%) + solvent	117 lb/234 lb/351 lb	Fall prior			X				Good
Pic Plus	chloropicrin (85%)	234 lb a.i./acre	Fall prior				X			Good
Pic Plus + Serenade Soil	chloropicrin (85%) + Bacillus subtilis	117 lb a.i./acre + 8.8 oz	Fall prior + at-plant				X			Good
Pic Plus + Serenade Soil	chloropicrin (85%) + Bacillus subtilis	351 lb a.i./acre + 4.4 oz	Fall prior + at-plant				X			Good
C60 Pic	chloropicrin (60%)	167 lb/250 lb/333 lb	Fall prior			X				Good
C60 Pic + Regalia SSC	chloropicrin (60%) + Reynoutria sachalinensis extract	167 lb a.i./acre + 4.0 fl oz	Fall prior + at-plant				X			Good
C60 Pic	chloropicrin (60%)	250 lb a.i./acre	Fall prior				X			Good
C60 Pic + Regalia SSC	chloropicrin (60%) + Reynoutria sachalinensis extract	333 lb a.i./acre + 0.5 fl oz	Fall prior + at-plant				X			Good
Mocap 15G + NAA	ethoprop (15%) + NAA	20.5 lb + 0.33 oz	At-plant			X				Poor
AmegA SC	iron, phosphite, plant oils, and surfactant	10.0 pt	At-plant			X				Poor

## BERRY PRODUCTION

## Berry Herbicide Update for 2015

Mohsen Mohseni-Moghadam and Douglas Doohan

Weeds have negative effects on berry and bramble crops by competing for light, water, and nutrients. They can reduce the quality and/or yield as well as cause problems during crop harvest and serve as hosts to insects and diseases. Therefore, weed control and management is of utmost importance for berry and bramble growers.

In order to achieve effective weed management in berry and bramble crops a combined approach of handweeding, ground cover crops, mulches, tillage practices, and herbicides is required. Weed control should start at least one year (preferably two years) before the plant is placed in the ground, during the establishment year by controlling the perennial weeds. The use of a broad-spectrum herbicide such as glyphosate (RoundUp) before planting is recommended.

Preventing weed seed production, especially for the new and hard to control weeds, is a crucial part of any successful weed management program. Once the stand is established, maintaining weed control will require a series of herbicide applications in spring, summer and fall to control the annual cycles of spring, summer and fall annuals as well as perennials establishing from seed. Here we summarize some recent registrations that will be part of a complete herbicide program for berry and bramble crops. None of the herbicides mentioned below will control all weeds, and must be part of a broader program.

**Zeus XC:** Zeus XC is a selective soil-applied herbicide for the control of susceptible broadleaf (i.e. redroot pigweed, common purslane, common lambsquarters), grass (e.g. green and yellow foxtail, large crabgrass) and sedge (e.g. purple and yellow nutsedge) weeds. It should be applied as a uniform broadcast soil application or a uniform band application directed to the base of the crop (e.g. blueberry, bushberry, caneberry) to provide preemergence control of weeds listed in the label.

For broadcast applications, a single application of Zeus XC should be made at 8-12 fl oz per acre (0.25-0.375 lb ai/A). When applied as a banded treatment (50% band or less), refer to the formula in the label for rate and volume. Zeus XC may be applied twice per year. Do not apply more than 12 fl oz product per acre (0.375 lb ai/A) on a broadcast application basis per year.

Zeus XC should only be applied to crops that have been established for 3 growing seasons and are in good health and vigor. For best control, Zeus XC should be applied before weeds emerge. If weeds are present, tank mix with a post-emergence herbicide to eliminate emerged weeds.

**Zeus Prime XC:** This is a selective herbicide that provides post-emergence contact and soil residual weed control. It may be applied as a burn-down and or preemergence application before or after weed emergence for control of susceptible broadleaf weeds. Zeus Prime XC is a 3.5 pound per gallon containing the active ingredients carfentrazone-ethyl and sulfentrazone.

Zeus Prime XC should be uniformly applied as a band application directed to the base of the berry and beds in berries (avoid contact with green foliage) to provide preemergence control of weeds. For broadcast applications, a single application of Zeus Prime XC should be made at 7.7 to 15.2 fl oz per acre (0.21 to 0.41 lb ai/A). Do not apply more than 15.2 fluid ounces (0.41 lb ai) per acre per twelve month period.

Zeus Prime XC should only be applied to crops that have been established for two growing seasons and are in good health and vigor. For improved weed management, Zeus Prime XC can be applied in a tank mixture with other preemergence and post-emergence herbicides.

**Matrix:** For improved control of annual and perennial broadleaf weeds and some grasses, apply Matrix SG at 4 oz/Acre. Matrix controls weeds when applied preemergence, or postemergence. Post-emergence applications require addition of a non-ionic surfactant. Matrix can be applied tank-mixed with other herbicides labeled on the crop. Matrix tank-mixed with glyphosate and either Karmex or Princep has provided improved control of perennial weeds in trials conducted at OSU.

(continued on page 27)



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**BERRY PRODUCTION**

**CLASSIFIEDS**

**Berry Herbicide...** (continued from page 26)

In particular, Matrix has provided good suppression of ground ivy, a species that is often a problem in brambles. Applications must be directed to avoid contact with crop stems and foliage. New growth that is sprayed with Matrix will suffer temporary crop injury. 21 day PHI.

**Callisto:** For improved control of annual and perennial broadleaf weeds apply Callisto at 6 oz/Acre. Include a crop oil concentrate for post-emergence applications. Tank mixes with Princep or Karmex may improve perennial weed control. Brambles are less tolerant of Callisto than blueberry and some temporary chlorosis of new growth will occur within several days of application. Callisto should not be applied after the onset of bloom or illegal residues may occur.

**Sandea:** The great strength of Sandea is post-emergence control of yellow nutsedge. In addition to nutsedge, post applications can be expected to control ragweed and pigweed. However, emerged lambsquarters and some other broadleaf weeds will not be controlled. Non ionic surfactant must be used with post sprays. For nutsedge ? oz/Acre is recommended.

Care should be taken not to spray primocanes or foliage in general. For blueberry less than 5 years established, do not use more than 2/3 oz/Acre, and do not apply if established for less than 12 months. Some blueberry varieties may be sensitive (eg. Elliot). Generally, temporary chlorosis should be expected if foliage is sprayed. 45 day PHI.

*Dr. Mohseni-Moghadam and Dr. Doohan are with the Department of Horticulture and Crop Science at The Ohio State Univ. From the VegNet Newsletter, The Ohio State Univ., Vol. 22, No. 2, April 20, 2015.*



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