

## PDA Implements Agricultural Surplus System

On April 12th, Pennsylvania Department of Agriculture Russell Redding announced the implementation of the Pennsylvania Agricultural Surplus System, known as PASS, throughout all 67 counties in the Commonwealth. This innovative program will put healthy and nutritious food grown by Pennsylvania farmers and crafted by Pennsylvania food producers into the charitable food system. PASS will make available \$1 million of funding that was included in the final state 2015-16 Budget. This announcement was hosted by the Pennsylvania State Council of Farm Organizations and was the capstone celebration at its annual Cornucopia Day event at the Capitol.

"Hunger impacts every county in Pennsylvania," said Secretary Redding. "We have an estimated 1.8 million Pennsylvanians who struggle with where their next meal is coming from, and nearly 600,000 of those people are children. In a state with an agricultural industry as robust as we have here in Pennsylvania, that is simply unacceptable.

"There is healthy and nutritious food available in the fields that never makes it into the food supply, and we want to see it put onto the plates of people who need it. I've often said that you cannot have a charitable food system without a food system that is charitable. This program makes it easier for more of the state's producers to contribute to the cause."

The Pennsylvania Agricultural Surplus System, or PASS, was created in 2010 following a successful 2008 pilot program in southcentral Pennsylvania. Under the pilot program, the Central Pennsylvania Food Bank was able to acquire 128,740 pounds of Pennsylvania-grown surplus apples with a retail



(left to right) Joe Arthur, Central Penna. Food Bank; Russell Redding, Penna. Secretary of Agriculture; and Gene Richard, Penna. State Council of Farm Organizations.

value of \$188,604 for an actual cost of only \$41,180, or about \$.32 per pound. The apples were then packed in three-pound bags that were distributed among the Central Pennsylvania Food Bank's 27-county service region.

In February of this year, the department issued a competitive request for proposals to implement PASS. The Central Pennsylvania Food Bank was the winning bidder.

With the funding appropriated through the state's 2015-16 budget, the food bank and the state's charitable feeding organizations will secure a variety of surplus agricultural products produced in Pennsylvania, creating additional supply to feed those who are at risk of hunger and providing an alternative market for

*(continued on page 2)*

## High Tunnel Bill Now Up for Senate Approval

As reported briefly in last month's newsletter, farmers who want to use high tunnels for their agriculture businesses would be exempt from requirements under the Storm Water Management Act under a bill approved by state House lawmakers. House Bill 1103, introduced by Rep. David Zimmerman, would exempt high tunnels from planning and regulatory requirements under the act. The Pennsylvania Department of Environmental Protection issued regulations that require some Pennsylvania municipalities to require high tunnels be subject to storm water planning and engineering rules. High tunnels are often used as temporary growing structures and, depending on the crop, are moved from field to field. Some municipalities have required berms or filter beds to manage storm water runoff around high tunnels, Zimmerman said. The bill now heads to the Senate for consideration.

PVGA members are encouraged to contact their state senators to urge them to support HB 1103 when it comes before the



*photo credit – Penn State*

Senate. It must first be approved by the Senate Environmental Resources and Energy Committee.

*Adapted from the Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, April 2016.*

## NEWS



## Pennsylvania Vegetable Growers Association

An association of  
commercial vegetable,  
potato and berry growers.

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Executive Secretary

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## PDA Implements... (continued from page 1)

many farmers in the commonwealth who currently have no outlet for safe, but lower-graded product.

"PASS will provide an opportunity to create new markets for many of the state's farmers and food producers who currently have no outlets or limited opportunity for surplus product," Redding added. "The program will also provide a safe, efficient system for farmers wishing to donate products to the charitable food system. Producers, packers and processors participating in PASS may be reimbursed for costs involved in harvesting, processing and/or packaging, and transporting donated product. In this way, Pennsylvania-produced products will stay in the state to help meet people's basic food needs."

"We are honored to be chosen as the contractor for the PASS Program for the 2015-16 fiscal year, and we are thankful to everyone involved in wisely establishing this program," said Joe Arthur, executive director of Central Pennsylvania Food Bank. "We view the PASS Program as a win-win-win situation: a win for Pennsylvania agriculture, a win for local food sourcing, and a win for Pennsylvanians in need that will receive this healthy bounty."

The Central Pennsylvania Food Bank has for almost 35 years been engaged in the acquisition and distribution of wholesome surplus food to people in need in Pennsylvania and has the infrastructure and partnership network needed to receive and coordinate the distribution of Pennsylvania agriculture products throughout the entire state.

As part of the PASS implementation process, the department is developing a database of producers who want to be considered as sources of product for the program. This database will include farmers who offer products such as fruits and vegetables, eggs, dairy, beef, pork and poultry.

Pennsylvania producers interested in participating in PASS can contact the department's Bureau of Food Distribution at 800-468-2433.

PASS is just one aspect of Governor Wolf's targeted approach to addressing food insecurity issues throughout Pennsylvania. In late September 2015, the governor issued an executive order establishing the Governor's Food Security Partnership. The executive order was announced during the state Food Security Summit, which brought together representatives from the state departments of Aging, Agriculture, Education, Community and Economic Development, Health, and Human Services, as well as several stakeholder groups from the private and non-profit sectors to discuss how to best coordinate efforts to tackle hunger in Pennsylvania.

For more information on the Pennsylvania Agricultural Surplus System and the Pennsylvania Department of Agriculture, visit [www.agriculture.pa.us](http://www.agriculture.pa.us). For more information on the Central Pennsylvania Food Bank, visit [www.centralpafoodbank.org](http://www.centralpafoodbank.org).

## Top 5 Stories for Farmers to Tell in 2016

Kari Barbic

The average consumer today may be three to four generations removed from the farm, but they are far from indifferent when it comes to knowing how their food gets to the table. People want the facts about their food—and being entrusted with those facts can help increase their trust in farmers, ranchers and other suppliers throughout the food chain. A recent survey by the Center for Food Integrity uncovered this key to growing consumer trust in agriculture: transparency. Consumers are eager to learn more, straight from the farm, and the start of a new year is a great time to consider which of the top stories you can bring to the table in 2016.

### Explain why you grow what you do

A short post on Facebook or Twitter is a great way to show the pride you take in your brand of agriculture. One of the most direct ways to help consumers understand the value in all types of agriculture is to hear farmers discuss how they choose to grow what's on their land. Do you grow conventional crops? Organic? GMO? Talk about how the type of soil you work on, your local climate and your family's well-being all factor into these choices. Weave your farm story into the larger story of agriculture in your community and state to help consumers understand how all farmers work together to keep healthy and affordable food on the table.

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

## USDA Offers New Loans for Portable Farm Storage and Handling Equipment

U.S. Department of Agriculture (USDA) will provide a new financing option to help farmers purchase portable storage and handling equipment. Farm Service Agency (FSA) Administrator Val Dolcini and Agricultural Marketing Service (AMS) Administrator Elanor Starmer announced changes to the Farm Storage Facility Loan (FSFL) program on April 29 during a local and regional food roundtable in Columbus, Ohio. The loans, which now include a smaller microloan option with lower down payments, are designed to help producers, including new, small and mid-sized producers, grow their businesses and markets.

“As more communities reconnect with agriculture, consumer demand is increasing for food produced locally or regionally,” said Dolcini. “Portable handling and storage equipment is vital to helping farmers get their products to market more quickly and better maintain product quality, bringing them greater returns. That’s why we’ve added this type of equipment as a new category for our Farm Storage Facility Loan program.”

The program also offers a new “microloan” option, which allows applicants seeking less than \$50,000 to qualify for a reduced down payment of five percent and no requirement to provide three years of production history. Farms and ranches of all sizes are eligible. The microloan option is expected to be of particular benefit to smaller farms and ranches, and specialty crop producers who may not have access to commercial storage or on-farm storage after harvest. These producers can invest in equipment like conveyers, scales or refrigeration units and trucks that can store commodities before delivering them to markets. Producers do not need to demonstrate the lack of commercial credit availability to apply.

“Growing high-value crops for local and regional markets is a common entry point for new farmers,” said Starmer. “Since they often rent land and have to transport perishable commodities, a loan that can cover mobile coolers or even refrigerated trucks fills an important gap. These producers in turn supply the growing number of food hubs, farmers markets or stores and restaurants interested in sourcing local food.”

Earlier this year, FSA significantly expanded the list of commodities eligible for Farm Storage Facility Loan. Eligible commodities now include aquaculture; floriculture; fruits (including nuts) and vegetables; corn, grain sorghum, rice, oilseeds, oats, wheat, triticale, spelt, buckwheat, lentils, chickpeas, dry peas, sugar, peanuts, barley, rye, hay, honey, hops, maple sap, unprocessed meat and poultry, eggs, milk, cheese, butter, yogurt and renewable biomass. FSFL microloans can also be used to finance wash and pack equipment used post-harvest, before a commodity is placed in cold storage.

AMS helps thousands of agricultural food producers and businesses enhance their marketing efforts through a combination of research, technical services and grants. The agency works to improve marketing opportunities for U.S. growers and producers, including those involved in specialty crop production and in the local and regional food systems. Visit [www.ams.usda.gov](http://www.ams.usda.gov) to learn more about AMS services.

Today’s announcement will further advance the efforts of USDA’s Know Your Farmer, Know Your Food initiative, which coordinates the Department’s work to develop local and regional food systems. USDA is committed to helping farmers, ranchers, and businesses access the growing market for local and regional foods, which was valued at \$12 billion in 2014 according to industry estimates. Under this Administration, USDA has

invested more than \$1 billion in more than 40,000 local and regional food businesses and infrastructure projects. More information on how USDA investments are connecting producers with consumers and expanding rural economic opportunities is available in Chapter IV of USDA Results on Medium.

To learn more about Farm Storage Facility Loans, visit [www.fsa.usda.gov/pricesupport](http://www.fsa.usda.gov/pricesupport) or contact a local FSA county office. To find your local FSA county office, visit <http://offices.usda.gov>.

## New Group GAP Program Announced

The U.S. Department of Agriculture’s (USDA) Agricultural Marketing Service (AMS) on April 5 announced the official launch of GroupGAP, a new certification program that helps small and mid-sized growers and cooperatives meet retailers’ on-farm food safety requirements.

“We know that GAP certification can sometimes be cost-prohibitive for smaller farmers,” said AMS Administrator Elanor Starmer. “GroupGAP allows these farmers to demonstrate compliance with strong food safety standards and share the cost of certification across a group of growers. That means greater market access for farmers, more options for consumers, and strong verification of food safety practices. It is a true win-win. We’re proud to have developed this innovative solution in partnership with our stakeholders.”

After a robust three-year pilot, AMS will today begin accepting applications for enrollment in GroupGAP, which certifies that grower groups are following industry-recognized food safety practices. By leveraging economies of scale and increasing efficiencies, GroupGAP improves market access for small and mid-sized farmers and benefits the entire produce industry.

The AMS Specialty Crops Inspection Division (SCI) performs Good Agricultural Practices (GAP) audits, which are voluntary audits to verify that farms are following industry-recognized food safety practices and recommendations from the Food and Drug Administration. Produce buyers, large and small, are increasingly requiring suppliers to be GAP certified. Under GroupGAP, farmers, food hubs, and cooperatives work together to obtain group certification. Their participation in the program in turn benefits retailers and other large-volume buyers, who are better able to meet the increasing demand for local foods and broaden their base of suppliers.

AMS GroupGAP audits include an analysis of the group’s system of oversight, a site visit to ensure compliance with various procedures, and spot checks to verify appropriate on-farm implementation. For more information or to submit an application, visit the GroupGAP Website at [www.ams.usda.gov/services/auditing/groupgap](http://www.ams.usda.gov/services/auditing/groupgap). You can learn more about the AMS GAP Audit Program at [www.ams.usda.gov/services/auditing](http://www.ams.usda.gov/services/auditing).

GroupGAP is just one example of the many AMS programs and services that support strong local and regional food systems, as described at [www.ams.usda.gov/services/local-regional](http://www.ams.usda.gov/services/local-regional). Across USDA, the Know Your Farmer, Know Your Food Initiative coordinates the Department’s policy, resources, and outreach efforts related to local and regional food systems. You can read more about the results of USDA investments in local food on the USDA website.

## NEWS

## National News Briefs

### Senators Fail To Adopt GMO Labeling Bill

The U.S. Senate failed to pass a biotechnology bill that would have established national standards for food derived from genetic modified organisms. In a procedural move, the Senate failed 48-49 to end debate on the bill and move it forward for a final vote. Both sides are continuing negotiations on the measure, but debate on the issue centers on whether it will call for voluntary, or mandatory, labeling. Sen. Pat Toomey voted in support of the bill. Sen. Bob Casey voted against Farm Bureau on the bill.

Senate Agriculture Chairman Pat Roberts, a Kansas Republican, introduced a bill that would have prevented a patchwork of state laws, and as a result save consumers money. Without a federal standard for labeling products containing ingredients derived from GMOs, state laws like one in Vermont—set to take effect in July—will lead to a patchwork of state laws. A recent study suggests that mandatory labeling would cost the average family an additional \$1,100 a year in increased food costs. AFBF President Zippy Duvall said the vote by Senators to not support the Robert's bill will ultimately harm farmers and consumers alike.

"To say we are angry with those senators who abandoned farmers and ranchers and turned their backs on rural America on this vote is an understatement. Their votes opposing this measure ignored science, threw our nation's food system into disarray and undermined the public's understanding of the many benefits of biotechnology in feeding a growing and hungry population," he said. "We remain hopeful they will have a chance at redemption by correcting this situation that will otherwise lead to increased food costs for consumers and stifle agricultural innovation, which remains a strength of our nation. We must not let anyone forget that rural America and our farmers and ranchers do matter."

Farm Bureau is continuing to work with the Senate on a GMO bill that meets Farm Bureau's grassroots policy and protects a farmer's ability to use biotechnology in the field.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, April 2016.*

### Listing of Bats as Threatened Mostly Positive for Agriculture

The federal Fish and Wildlife Service has listed the Northern Long-Eared Bat as threatened, a move that will mostly allow farmers and timber harvesters to continue as normal with their businesses. Farmers were concerned the listing could have caused them to curtail spraying or other crop treatments along fence rows. But the regulations approved by the Fish and Wildlife Service focus mostly on protecting bats when they hibernate, and in the rearing of their young.

Northern Long-Eared Bats, which range throughout the East Coast and are found throughout Pennsylvania, are suffering from White Nose Syndrome, which has decimated populations. The virus is spread during bat hibernation. As a result, some environmental organizations pushed to have the bat protected under the Endangered Species Act. While the bat will receive protection under the act, the impacts on farmers will be minimal, said Ryan Yates, a director of Congressional relations for the American Farm Bureau Federation. Most of the regulations surrounding the bats focus on avoiding disturbing bats when they hibernate, he said.

"We can continue with farm activities, we can apply crop protections and fertilizers," he said. "The focus for the Fish and Wildlife Service is to look at treatments for the disease. That is the real cause of species decline."

Homeowners can also remove bats from structures without violating the Endangered Species Act, Yates said. Some restrictions will apply for the removal of timber. Landowners would need to apply for a permit from the Fish and Wildlife Service to harvest timber within a quarter mile radius of a cave or mine with a confirmed population of Northern Long Eared Bats, Yates said. Landowners could still remove hazardous trees without a permit. In addition, landowners would be prohibited from taking trees within 150-feet of an area bats use as maternity roosting sites from June 1 to July 30. That is to keep the disturbance of bats to a minimum as they are raising their young.

Last year, the Fish and Wildlife Service had proposed a series of interim rules that would have placed greater restrictions on agriculture activities, including the application of pesticides and other crop treatments near bat roosting sites, Yates said. Farm Bureau and other agriculture organizations filed comments on the rule, which the service took into account when drafting the final regulations, he said. Biologists for the service found that the virus, not human activity, was harming bat populations, Yates said.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, April 2016.*

### USDA Announced Funding for Protects In Three Watersheds

The U.S. Department of Agriculture is making \$700,000 available for water quality improvement projects in three watersheds within the Chesapeake Bay Watershed.

Grants through the National Water Quality Initiative will help farmers in Bedford, Blair and Mifflin counties with conservation projects that will improve water quality.

Grants are administered through the National Resource and Conservation Service. Covered projects include nutrient management, cover crops, terraces and buffers.

The three watersheds slated for funding in Pennsylvania are:

Upper Kishacoquillas in Mifflin County. The watershed drains more than 19,000 acres in the Kishacoquillas Valley, also known as "Big Valley." Agriculture makes up 60 percent of the land mass. The Pennsylvania Department of Agriculture has designated it as impaired.

Beaver Creek and Upper Yellow Creek are located in Bedford and Blair counties and are both located in the Yellow Creek watershed. Yellow Creek is a tributary of the Juniata River and drains the area known as Morrison's Cove. The region is home to a number of dairy farms. The DEP has said that tributaries in the region are impaired.

Applications can be submitted at any time, but April 15 was the deadline for this current funding cycle. For more information, contact your local USDA office.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, April 2016.*



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## NEWS

## Game Commission Sets Deer Seasons and Allocations

The Pennsylvania Board of Game Commissioners set hunting and trapping seasons and bag limits for the 2016-17 license year, which begins July 1 at their April 5 meeting.

The commissioners also set the number of antlerless deer licenses to be allocated, as well as the number of elk licenses to be allocated for the coming license year.

The board voted to allocate 748,000 antlerless deer licenses statewide. Allocations by Wildlife Management Unit (WMU) are as follows, with the allocation from the previous license year appearing in parentheses: **WMU 1A - 46,000** (46,000); **WMU 1B - 29,000** (29,000); **WMU 2A - 43,000** (43,000); **WMU 2B - 61,000** (61,000); **WMU 2C - 31,000** (31,000); **WMU 2D - 55,000** (55,000); **WMU 2E - 21,000** (21,000); **WMU 2F - 22,000** (22,000); **WMU 2G - 21,000** (22,000); **WMU 2H - 6,000** (6,500); **WMU 3A - 15,000** (19,000); **WMU 3B - 28,000** (28,000); **WMU 3C - 36,000** (36,000); **WMU 3D - 25,000** (25,000); **WMU 4A - 30,000** (30,000); **WMU 4B - 26,000** (26,000); **WMU 4C - 25,000** (25,000); **WMU 4D - 34,000** (33,000); **WMU 4E - 25,000** (25,000); **WMU 5A - 19,000** (19,000); **WMU 5B - 50,000** (50,000); **WMU 5C - 70,000** (70,000); and **WMU 5D - 30,000** (24,000).

Hunters should note the boundaries again have changed for WMUs 5C and 5D.

The Commissioners retained a split, five-day antlered deer season (Nov. 28-Dec. 2) and seven-day concurrent season (Dec. 3-10) in 18 Wildlife Management Units. The list includes

WMUs 1A, 1B, 2A, 2C, 2D, 2E, 2F, 2G, 2H, 3A, 3B, 3C, 3D, 4A, 4B, 4C, 4D and 4E. The package also retains the two-week (Nov. 28-Dec. 10) concurrent, antlered and antlerless deer season in WMUs 2B, 5A, 5B, 5C and 5D.

Hunters with Deer Management Assistance Program (DMAP) antlerless deer permits may use the permits on the lands for which they were issued during any established deer season, and will continue to be permitted to harvest antlerless deer from Nov. 28-Dec. 10 in 1A, 1B, 2A, 2C, 2D, 2E, 2F, 2G, 2H, 3A, 3B, 3C, 3D, 4A, 4B, 4C, 4D and 4E. Fees for DMAP permits are \$10.70 for residents and \$35.70 for nonresidents.

DMAP permits also may be transferred to Mentored Hunting Program participants.

The board retained the same antler restrictions by which adult and senior license holders have abided since the 2011-12 seasons. It remains the "three-up" on one side, not counting a brow tine, provision for the western Wildlife Management Units of 1A, 1B, 2A, 2B and 2D, and the three points on one side in all other WMUs. Those exempt from these antler restrictions are mentored youth hunters, junior license holders, disabled hunters with a permit to use a vehicle as a blind and resident active-duty military on leave.

Once again this year, the commissioners approved concurrent hunting of antlered and antlerless deer in WMUs 2B, 5C and 5D during all seasons, with the first segment of the archery season to run from Sept. 17 to Nov. 26 in those WMUs.

## State News Briefs

### Governor Allows Fiscal Code Bill to Become Law

Governor Tom Wolf will allow a bill that would restore funding to several agriculture programs to become law without his signature like he did the budget. Gov. Wolf's previous veto of the fiscal code threw into jeopardy the ability of money to be transferred from the Race Horse Development Fund to pay for programs like the state's Veterinary Lab System, Animal Health and Diagnostic Commission, along with Pennsylvania Fairs. The Pennsylvania Department of Agriculture has been using funds to cover some of those expenses, but with the end of the fiscal year looming, the department is running out of money to carry those programs. Both the House and Senate approved House Bill 1589 with strong bipartisan support. The fiscal code is the last step in a caustic budget battle that has lasted since last summer. While Gov. Wolf eventually allowed the state budget to become law, the veto of the fiscal code still caused problems for state spending on several critical agriculture areas.

*Adapted from Farm Bureau Express, Penna. Farm Bureau, April 22, 2016.*

### Legislation Introduced to Increase Hunting Licenses

A bipartisan group of Senators introduced legislation to increase the state's hunting license. If approved, it would be the first increase of hunting licenses in Pennsylvania in 17 years. All hunting fee increases must receive legislative approval. Under the bill, a general hunting or furtaker license would increase to \$29 from \$19. Resident junior and senior license fees would stay the same. The bill also calls for increases for special hunting privileges, such as waterfowl, archery and bear. In addition, the bill calls for the creation of a combination license, called the Ultimate Outdoorsman, which would give a wide variety of hunting options for a \$110 fee. The Game Commission does not receive state tax dollars for operations and instead relies on hunting and trapping fees. About 35 percent of Game

Commission revenue comes from hunting and furtaker license sales, along with excise tax on guns and ammunition and the sale of natural resources. Farm Bureau policy supports a \$5 increase in general hunting licenses.

*From the Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, April 2016.*

### General Assembly Approves Industrial Hemp Bill

The Pennsylvania General Assembly adopted a bill that would allow for a pilot program for the growing of industrial hemp. Senate Bill 50, introduced by Sen. Judy Schwank, would provide for limited growing of hemp, under the supervision of state government and a research university. The bill now heads to Gov. Tom Wolf for consideration. Hemp was once grown as a cash crop in Pennsylvania before production was outlawed by the federal government. A provision in the 2014 Farm Bill allowed for states to establish limited pilot programs supervised by the Pennsylvania Department of Agriculture.

"The goal is to research best practices and clear the way for Pennsylvania to become a hemp-farming powerhouse," Schwank said. "I am not expecting hemp to be used commercially for many years, but this pilot program gets Pennsylvania's foot in the door, and opens the possibilities for future generations of farmers."

*From the Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, April 2016.*

### PFB Leads the Push to #SavePSUAg

When Penn State Extension faced its most serious funding crisis in its more than 100-year history, Pennsylvania Farm Bureau led efforts to push for legislative action. Both in the state capitol, and the court of public opinion, Pennsylvania Farm Bureau members spoke about the impact Penn State Extension has had on their families. Farmers, from across the state, rely on the expertise of Extension experts—regardless of their commodity.

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## NEWS

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

Throughout the process, PFB explained the harm that would come to the agriculture industry if Extension closed. Extension saw its budget cut to zero as part of an ongoing budget battle in Harrisburg that stretched back to July. At a press conference hosted by Pennsylvania Farm Bureau at Penn State's Fruit Research and Extension Center in Adams County, Bruce Hollabaugh, a local fruit grower, discussed the close relationship that exists between growers and Extension experts. Throughout the growing season, fruit growers are in daily contact with experts at the research center to help them understand the latest in pest detection and biological controls for diseases. The center also played a key role in researching invasive species like stink bugs. The loss of that kind of help would deliver a serious blow to the fruit industry, and one that can't easily be replaced by private industry, or another university, Hollabaugh said.

"If there are no more scientists, no more Extension agents, the impact will be immediate and devastating to our community," he said.

Hollabaugh praised the work of Extension researchers in their response to threats posed by stink bugs. The pests came into the region during the height of harvest, and growers did not have the time or resources to examine how to combat the invasive species.

"It really threatened the very viability of what we do," Hollabaugh said. "Without Penn State Research, and Extension to disseminate the information, it could have resulted in losses that far exceeded the losses we had."

During the same press conference, PFB President Rick Ebert, said he has worked with Extension since he first started farming, and has relied on their expertise for soil testing and nutrient recommendations. Recently, he turned to Extension for help with transition planning as he brings the next generation into the family business.

"It set our family at ease and turned an awkward conversation about roles, responsibilities and finances into a productive discussion," he said.

PFB Vice President Chris Hoffman testified at a joint hearing of the Senate and House Agriculture & Rural Affairs committees about how much farmers count on Extension and veterinary labs as a first line of defense for diseases. Hoffman, who owns a hog and chicken farm in Juniata County, praised the work between Extension and the Pennsylvania Department of Agriculture on establishing protocols for the monitoring of highly-pathogenic avian influenza.

"These are the things as farmers that we can't do alone," he said. "We need Extension and Research to help us through this."

*From the Pennsylvania Agricultural Alliance Issues Update, Penna. Farm Bureau, April 2016.*

**Young Farmers Learn To Advocate**

Taking a weekend away from a family business is never easy. But more than 150 young farmers made a point of setting aside a weekend to focus on agriculture advocacy and learning ways to improve their businesses. Pennsylvania Farm Bureau's Young Farmer & Rancher Committee hosted their statewide leadership conference in February.

It gave farmers the chance to attend workshops that focused on smart management decisions, including talks by agronomists, understanding beginning farmer programs, and insight into agriculture financing.

Throughout the weekend, young farmers learned about how to become agriculture advocates and the opportunities

available through Farm Bureau. PFB President Rick Ebert shared his leadership journey in Farm Bureau, which started as a young farmer attending a similar leadership conference. In addition, motivational speaker Barrett Keene, who is a past national FFA officer, encouraged participants to find areas where they could be a help.

Don Buckman, who chairs the state's YF&R Committee, said young farmers who attended had the chance to see what Farm Bureau is doing for them and the difference they can make in their communities.

"It betters you as a person and a farmer," he said. "You see what Farm Bureau is doing for you and agriculture."

*From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, March 2016.*

# We Recycle

## Used Agricultural & Horticultural Plastics We Buy the Following Materials:

- ◆ Horticultural Plastic Containers, NO Pesticide Jugs  
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# NEWS

## Top 5 Stories... (continued from page 2)

### Describe what goes into keeping food safe

Food safety is a top concern for consumers, trailing behind concerns for cost of food, healthcare and energy. The Center for Food Integrity polled a sampling of consumers and found 62 percent ranked food safety highest on their list of concerns, ahead of food supply and animal care. Of course, this isn't really surprising: we all want safe food. While you can't control what happens beyond your farm, you can talk about the strict procedures you follow to produce safe and affordable food. Remind consumers that you're feeding what you grow to your family and neighbors, and that safety is your top priority for your family and theirs. The pride you take in producing safe and healthful food can shine through in posts you share from harvest to the dinner table.

### Discuss how you conserve natural resources

As those who care for the land and local environment hands-on 24/7, who better to tell the story of the careful work you do to conserve water and protect the soil and native species? Farmers have a great story of success in reducing environmental impact and should share it proudly. Have you developed plans with your local conservation district? Reduced pesticide use through GM seeds? Cut back on water or fertilizer through upgrades in technology? Let it be known that while others are talking about environmental stewardship, you're actually doing something about it.

### Tell your tale of tradition and sustainability

Whether you're a sixth-generation farmer or the first in your family, you can share the importance of working together for the good of agriculture. Talk about how the choices you make today are influenced by years of tradition or by your desire to pass the farm legacy on to the next generation. Consumers are looking for answers, even if they disagree on finer points in the end. Resolve to boost the voice of agriculture by keeping your message simple and straightforward in 2016.

### Show how you keep your animals safe and healthy

Many consumers are simply unaware of the in-depth expertise and careful planning that goes into developing nutrition and treatment plans for livestock. If you have livestock on your farm, talk about how you work with veterinarians and nutritionists to ensure your animals are getting the best treatment and diet to meet their needs. Explain the housing options you've chosen for keeping your animals safe and healthy. A quick Instagram post can go a long way in showing the clean and safe conditions you work so hard to provide in order to keep your livestock safe from the elements.

*Ms. Barbic is a Media Specialist with the American Farm Bureau Federation. From the **Penna. Agricultural Alliance Issues Update**, Penna. Farm Bureau, January 2016*

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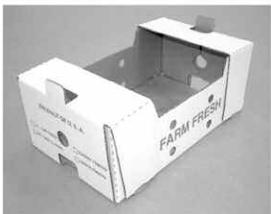
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## GENERAL

## What Can Pennsylvania Agriculture Expect in 2016

Mike Evanish

As a part of my duties as manager of MSC Business Services, I track the ever-changing economic environment faced by Pennsylvania agriculture, the nation and the world. Before the data explosion created by the internet, this was much easier than it is today.

With all of the available information, a ravenous reader cannot help but begin to make connections between seemingly unrelated topics.

There's a few seemingly unrelated items that could very well impact our state's agriculture economy for the year ahead: the significant El Niño event taking place in the Pacific Ocean; the European economy's disarray; the limited domestic growth in demand for our production which is increasing the importance of exports and the high value of the dollar relative to other currencies.

El Niño - Historically, a strong El Niño tends to bring rain to California and the desert southwest, stretching east through Florida. This also tends to result in drier weather in Pennsylvania. Certainly those producers that suffered through the wet 2015 planting season will welcome drier weather. But will it get too dry? Dry is usually a bigger worry for crop production than wet. Also, not all El Niños are the same, meaning this might not even be a threat. All El Niño events have an effect on crops and should be taken into account when selecting seed and timing planting in the spring; spring 2016 should be no different.

European Quantitative Easing - The European Central Bank has begun a program of Quantitative Easing to stimulate the European Union's struggling economies. Their program is fashioned after our 2009 - 2013 program. For us, the program was great for Wall Street, but its effect on agriculture seems questionable. Make no mistake, a weak European economy will result in fewer American exports being purchased, so anything that strengthens their economy should be good for Pennsylvania agriculture.

Domestic Demand - Demand within the United States can be fickle. Take sugar for example. Sugar from beets or sugar cane is currently looked at favorably; sugar from corn, not so much. There is no reason for me to get into the science, since I am not qualified anyway, as it is all about freedom of choice. The marketplace decides what should be produced in the end. So if you are a corn processor, producing sugar and domestic demand drops for your product...exporting your product could be your only short-term choice. Long-term there is scientific studies and advertising, but short-term options can be limited.

The Dollar - The dollar's high relative value against other currencies is currently creating barriers to exporting. It is more difficult to sell production overseas when the dollar is high. Lower overseas sales results in excess supply here at home and that drives down prices. Lower prices inevitably lead to business failures for high cost producers. The sugar processor above going out of business due to market changes and the dollar would result in one less place to sell a corn crop, locally driving down the price of corn. My message here is that producers must know their markets, the relative financial health of those purchasing their products, and purchaser's market trends. No one wants to ship product for which they will not be paid.

Corn and Soybeans - Corn and soybeans are tied together in Pennsylvania, just as they are everywhere they are grown. When Congress decided in 2006 that ethanol made from corn would be a wonderful thing to add to gasoline, demand for corn had to skyrocket. From virtually no corn for ethanol demand in 2007 to the over 5 billion bushels used for this purpose today, corn has seen dramatic supply and price increases. The

drought in the Midwest a few years ago also contributed to the price volatility. Producers and seed companies seeing the magnitude of potential profits, planted all the corn they could and developed varieties that greatly increase production. Corn price increased so much that soybean acreage dropped significantly, which resulted in a shortage of soybeans and its price run up. So government policy involving the environment has a great effect on profitability. But much has changed recently. First, ethanol has hit the "blend wall." This is a fancy way of describing the fact that no more corn is needed for ethanol. Virtually all gasoline sold in America already contains 10% ethanol - add any more and engines using the fuel will begin to fail. Politicians certainly do not want to see that. So a rise in the required ethanol content is years away, if it ever takes place.

(continued on page 11)



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GENERAL

## 2016 Winter Temperatures

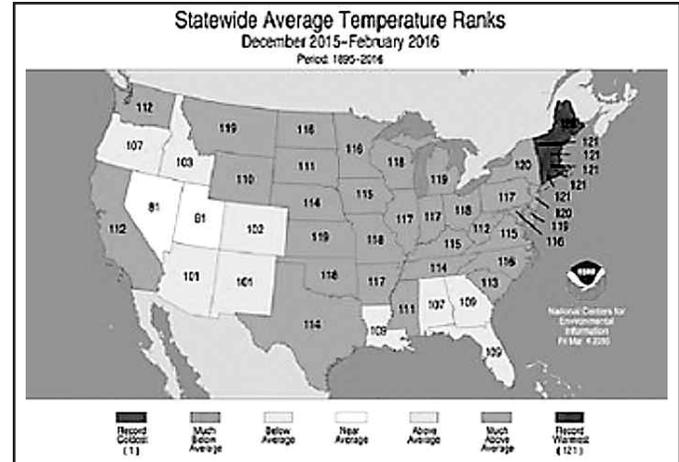
Robert Crassweller

A top-three “warm episode” (El Niño) brought some widely expected winter weather impacts to the U.S., but also provided some surprises. For example, atmospheric warmth in part supplied by the balmy central and eastern equatorial Pacific Ocean contributed to the nation’s warmest December to -February period on record.

Given the warming influence of El Niño and the lack of sustained cold waves, it was not surprisingly that this was the warmest U.S. winter during the period of record that began in 1895-96. According to National Centers for Environmental Information (NCEI), the nation’s winter average temperature of 36.8°F was 4.6°F above the 1901-2000 mean. It was the warmest winter on record in all six New England states, and among the ten warmest in 28 other states (see figure).

NCEI indicated the contiguous U.S. experienced its seventh warmest and 46th-driest February during the 122-year period of record. The nation’s monthly average temperature of 39.5°F was 5.7°F above the 1901-2000 mean. Overall, it was the nation’s warmest February since 2000. All states reported a February average temperature in the upper (warm) half of the historical distribution. For a dozen states across the western and central U.S., as well as three states in New England, temperatures were among the ten highest respective February values on record.

*Dr. Crassweller is with the Department of Plant Science at Penn State Univ. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, extension.psu.edu/vegetable-fruit/news, March 31, 2016 as adapted from the USDA **Weekly Weather & Crop Bulletin**.*



### What Can... (continued from page 10)

Additionally, in a repeat of history, agriculture has produced itself into low prices for corn and soybeans. Just as something to watch out for, imagine the price devastation if the mandate ended tomorrow.

Expectations for 2016 - From corn to soybeans to milk, 2015 has been a tough year. At present, I see nothing to indicate that 2016 will see much if any price improvement from 2015. Every indication is that 2016, at best, will be a repeat of 2015. So work hard on your 2016 budget and make sure every action taken will be taken in a way that will improve your bottom line.

*Mr. Evanish is Manager of MSC Business Services for the Penna. Farm Bureau. From the **Penna. Agricultural Alliance Issues Update**, Penna. Farm Bureau, January 2016.*

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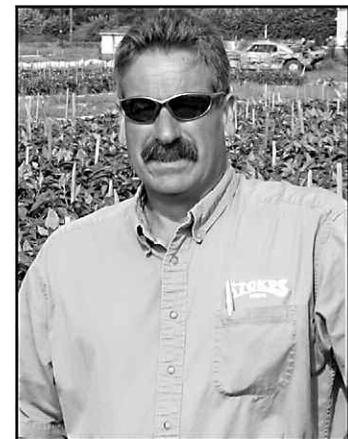
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## GENERAL

## *Pennsylvania Vegetable Growers Association* *Serving Growers for 90 Years • 1926 - 2016*

### 1941 Pennsylvania Ten-Ton Tomato Club

Michael Orzolek

The Pennsylvania Ten-Ton Tomato Project was sponsored by the Pennsylvania Vegetable Growers' Association. The Ten-Ton Tomato Club Committee included H. W. Huffnagle, Quarryville, PA – Chair, Alan Warehime, Hanover, PA and Jesse M. Huffington, State College, PA – Association Secretary.

There were 631 processing tomato growers in 1941 that harvested at least 10 tons/A of processing tomatoes in Pennsylvania. The largest grower was Starkey Farms Company, Morrisville (Bucks Co.), PA. Starkey Farms harvested 1,115 tons of tomatoes from 75 acres for a 14.9 t/A average yield. There were 15 growers with at least 20 acres or more of processing tomatoes in 1941. Approximately 98% of the other 616 growers grew less than 20 acres of processing tomatoes; many growers had less than 5 acres of tomatoes. There were also 12 growers with marketable processing yields greater than 20.0 t/A.

### New NRCS GAPS Publication Available

Food safety has become a prominent issue for growers of produce, and conservationists who assist them, in planning and installing stewardship practices. In November 2015, the FDA published the Produce Rule, which is one of seven major regulations it will use to enforce the Food Safety Modernization Act (FSMA).

“Co-Managing Farm Stewardship with Food Safety GAPs and Conservation Practices: A Grower’s and Conservationist’s Handbook” was written by the Wild Farm Alliance, with major support from NRCS.

The document covers how pathogens can get on the farm, the prevalence of pathogens in wildlife and livestock, and environmental factors that influence pathogen reduction. A multi-barrier approach is presented where conservation practices and food safety Good Agricultural Practices (GAPs) can be used to reduce food safety risk.

The PDF of the publication can be downloaded at [http://www.wildfarmalliance.org/food\\_safety\\_and\\_conservation\\_resources](http://www.wildfarmalliance.org/food_safety_and_conservation_resources). You can find the Wild Farm Alliance at 831-761-8408.

From the *Vegetable Notes for Vegetable Farmers in Massachusetts*, Univ. of Mass. Extension, Vol. 28, No. 3, March 10, 2016.

The growers producing the highest yields on 2 or more acres included:

First- L. J. Bender, Allentown, PA – 3 acres with a 25.3 T/A yield  
Second – Arthur S. Hiesler, Tamaqua, PA – 4.4 acres with a 23.5 T/A yield

Third – Howard Garges, Chalfont, PA – 5 acres with a 21.0 T/A yield

Fourth – J. A. Lahr, Sunbury, PA – 2.3 acres with a 20.8 T/A yield

Fifth – Rachel Hunsberger, Chalfont, PA – 6 acres with a 20.5 T/A yield.

Largest acreage on any farm in 1041

Starkey Farms Company, Morrisville, PA – 75 acres with a 14.9 T/A yield.

Many processing tomato growers were in a 3 to 4 year rotation with corn, alfalfa, oats, wheat and/or potato. Most growers applied 6 to 15 T/A of animal manure either the preceding fall or in spring prior to working the field. Principal tomato varieties that were being grown included: Rutgers, Landreth, Marglobe, and Pritchard.

*Dr. Orzolek is Professor Emeritus of Vegetable Crops at Penn State Univ.*



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# Pest Alert - Allium Leafminer

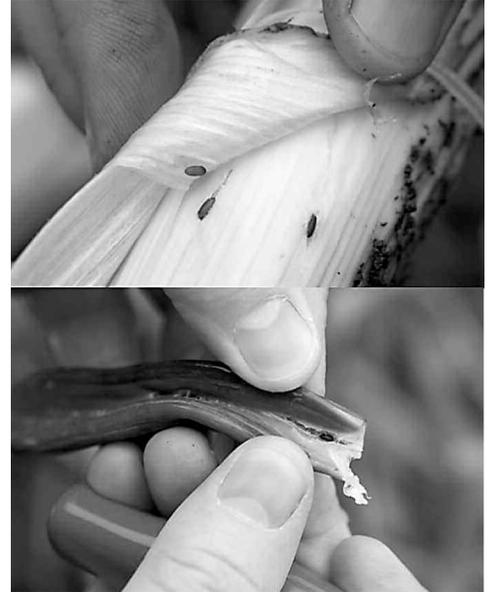
Shelby Fleischer, Timothy Elkner, and D. Gilrein

The allium leafminer (also known as the onion leafminer) has recently been confirmed from infested leeks and onions collected in December 2015 from Lancaster County, Pennsylvania. This is the first confirmed infestation in the Western Hemisphere. Your assistance is needed for monitoring and controlling this new invasive species.

**Host Plants and Damage Symptoms** - The allium leafminer has been reported to infest species in the genus *Allium*. Leeks (*A. porrum*) tend to be described as the most damaged host, which may be influenced by the timing of the second generation and the planting of leeks. Infestations have also been reported in onion (*A. cepa*), garlic (*A. sativum*), chive (*A. schoenoprasum*), shallot (*A. cepa*), and green onion (*A. fistulosum*). There are many ornamental species of *Allium*, some wild species are common weeds, and at least one species is endangered (*A.*

*munzii* in California). Current literature varies in reporting damage in ornamental and wild *Allium* spp. The full host range is unknown.

Adult females make repeated punctures in leaf tissue with their ovipositor, and both females and males feed on the plant exudates. Leaf punctures arranged in a linear pattern towards the distal end of leaves may be the first sign of damage. Leaves can be wavy, curled and distorted. Larvae mine leaves, and move towards and into bulbs and leaf sheaths where they pupate. Leaf mines are most evident in species with thin leaves (chives). In species with larger leaves, it is often necessary to peel back the leaves to find the insect. Both the leaf punctures and mines serve as entry routes for bacterial and fungal pathogens. High rates of infestation have been reported: from 20



*Allium Leafminer pupa embedded in leaf tissue from a field in Lancaster PA. Photo L. Donovall.*



*Wavy, curled and distorted leaves from the allium leafminer. Photo: L. Donovall.*

(continued on page 14)



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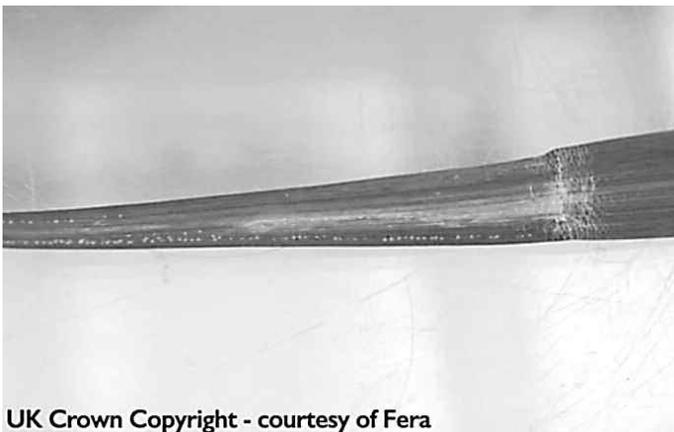


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## VEGETABLE PRODUCTION

**Pest Alert...** (continued from page 13)

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Feeding punctures along side of leaf

to 100 pupae per plant, and 100% of plants in fields. The literature suggests organic production and market garden production systems tend to be most at risk, perhaps due to insecticidal control in conventional production systems. Leafminers as a pest in *Allium* crops has rapidly increased following introduction of allium leafminer.

**Distribution** - The allium leafminer was first described in 1858 from Poland, and is native to Poland and Germany. Recently, the geographic range has been rapidly expanding. It is now present throughout Europe, reaching the United Kingdom in 2004. It has recently been reported in Asia, Turkey, and parts of Russia and Turkmenistan.

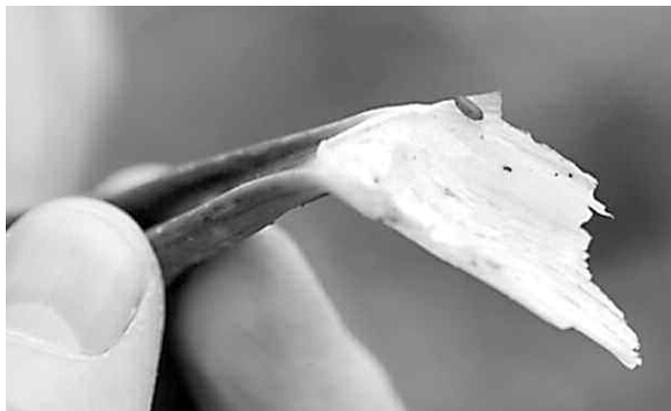
**Identification - Adults:** Small (~ 3 mm) long grey or mat-black colored flies with a distinctive yellow or orange patch on the top and front. Yellow color also present on side of abdomen. Wings held horizontally over abdomen when at rest. Legs with distinctive yellow "knees" (at femur-tibia junction). White halteres. Although adults are fairly distinctive, male genitalia are required to confirm identity.

**Eggs:** White, 0.5 mm long, and slightly curved.

**Larvae:** White, cream, or yellowish maggots, headless, up to 8 mm long at their final instar.

**Pupa:** Dark brown, 3.5 mm long, with a pair of posterior spiracles with 18-20 bulbs per spiracle.

**Life History** - Allium leafminers overwinter as pupae in plant tissue or surrounding soil. Adults emerge in late winter (March) into spring (throughout April, perhaps into May), and lay eggs at the base of plant stems. Larvae mine leaves, and move downward into the base of leaves or into bulbs, where they pupate. Pupae may move into soil. These 1st generation pupae undergo a diapause or aestivation period which lasts throughout the summer, and develop into adults that emerge in the autumn



Allium Leafminer pupa. Photo by Donovall.

(September / October). This 2nd generation of adults lay eggs into *Allium* spp., which develop through the larval and into the pupal stage. These 2nd generation pupae will overwinter. Egg-to-adult development is estimated to require 1,090 degree-days using a 5.1°C/41.2°F threshold, or 1,225 degree-days using a 3.2°C/37.8°F threshold.

**Monitoring and Management** - Adults have been captured using yellow sticky cards or yellow plastic bowls containing soapy water.

Covering plants in February, prior to the emergence of adults, and keeping plants covered during spring emergence, can be used to exclude the pest. Avoiding the adult oviposition period by delaying planting (after mid-May in Poland) has also been suggested to reduce infestation rates. Covering fall plantings during the 2nd generation flight can be effective. Growing leeks as far as possible from chives has been suggested. Continuous cultivation of *Allium* species (such as chives) provides the pest with a continuous food source.

Systemic and contact insecticides can be effective. EPA registrations vary, however, among *Allium* crops. Check labels to ensure the crop is listed, and for rates and

(continued on page 15)



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Adult Allium Leafminer



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**VEGETABLE PRODUCTION**

**Pest Alert...** (continued from page 14)

days-to-harvest intervals. Options labelled for leafminers or dipteran leafminers that may be effective include azadirachtin (Aza-Direct or other formulations), cyromazine (Triguard), dinotefuran (Scorpion), lambda-cyhalothrin (Warrior II or other formulations), spinetoram (Radiant), spinosad (Entrust or other formulations), and zeta-cypermethrin (Mustang or other formulations). Other materials labelled for *Liriomyza* leafminers or thrips that may be effective include abamectin (Agri-Mek or other formulations), acetamiprid (Assail), and cyantraniliprole (Exirel). Among these, the Entrust formulation of spinosad is allowable for certified organic production if allowed by your certifying organization.

**Reporting a Possible Detection** - If you suspect believe you may have observed damage or a life stage of the allium leafminer, please contact a plant inspector in the regional Department of Agriculture office or an Extension Educator or Diagnostic Laboratory in the local Cooperative Extension Office. In Pennsylvania, contact the plant inspector in your regional office of the Pennsylvania Department of Agriculture or an Extension Educator in the local Penn State Extension office.

*Dr. Fleischer is with the Department of Entomology at Penn State Univ., Dr. Elkner is with Penn State Extension in Lancaster Co. and Edited by D. Gilrein with Cornell Cooperative Extension of Suffolk County. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension, extension.psu.edu/vegetable-fruit/news, April 11, 2016.*



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VEGETABLE PRODUCTION

# Don't Transplant Maggots

Shelby Fleischer

We're seeing root maggot problems this year, and some from infestations that probably started in when growing the transplants.



Seedcorn maggot life cycle Photo: Art Cushman, USDA Systematics Entomology Laboratory, Bugwood.org

We're seeing maggot problems this year, and some from infestations that probably started when growing the transplants. Several species from the same genus (*Delia*) cause the damage. The most common has been seedcorn maggot (*D. platura*), although recent samples may be the bean seed maggot (*D. florilega*). Management is similar for both species, and sometimes they co-exist in mixed populations. Seedcorn maggot biology is summarized in "Vegetable Gardening: Recommendations for Home Gardeners" (<http://extension.psu.edu/publications/agrs-115/view>).

"Maggots pupate inside a dark brown, capsule-like puparium that resembles a grain of wheat. Seed corn maggot puparia can be found in soil throughout the year, and maggots overwinter in these puparia. The adult flies emerge from the puparia [in] late April and early May. The adults are brownish gray flies that closely resemble common houseflies, except that they are about half the size. Tiny, white, elongated eggs are deposited among debris and around

plant stems near the soil surface. Eggs hatch in a few days and the maggots work their way into the soil in search of food. Maggots (the immature larval stage) are dirty white with a yellowish tinge, legless, cylindrical, and tapered; full-grown maggots reach 1/5 to 1/4 inch in length.



Photo: Maggots pupate inside a dark brown, capsule-like puparium that resembles a the seed or on grain of wheat.

the underground parts of seedlings. Damaged seed may germinate, but there may be too few food reserves left in the seed for the plant to survive. The time required to grow from egg to adult is between three and four weeks. There are three to five generations each year in Pennsylvania. Populations tend to decline during the dry months of summer."

This year we are finding large (thus, older) maggots, in high numbers, feeding up into the plant stem, within days of transplanting. This sounds like the adult flies laid eggs on the transplants while they were still in the greenhouse / high tunnel. The eggs would not have had enough time to develop to large larvae in the few days after transplanting. Check transplants for maggots before transplanting by combing through the root ball and slicing open stems.

We are also hearing of field infestations. Classically, cool, wet, slow-growing spring weather is great for maggot pest prob-

(continued on page 17)

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## VEGETABLE PRODUCTION

**Don't Transplant...** (continued from page 16)

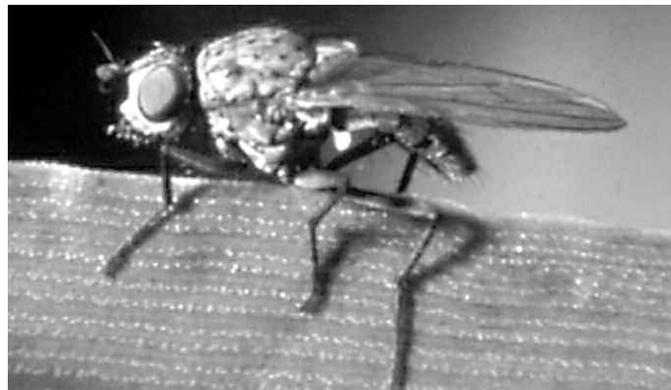
lems. Plants are less able to outgrow the maggot feeding. Planting in warm soils is the best management option. If you have to plant in cool soils, avoid planting into an abundance of decaying organic matter. Incorporate organic matter well, several weeks prior to planting. Be prepared to replant if you have significant stand loss. Check if the maggots are young (less than 3/8 inch), and if they are, wait another week or two for them to pupate before replanting.

Both seedcorn maggot and bean seed maggot have a very wide host range, and sweet corn, beans, and muskmelons (from seed or transplant) have had significant damage in the past. Cabbage maggot and onion maggot have also caused problems to the crops that carry their name. Some experts can distinguish among species with the larger larval stages, using prothoracic spiracles and patterns on the rear anal plate. Adults are helpful to distinguish species.

Seed treatments (neonicotinoids, or chlorpyrifos), and pre- or at-plant soil treatments (organophosphates or pyrethroids) are registered for sweet corn, and can provide effective control, and each crop will have different registered options. Neonicotinoids used at planting for other pests also provide some control of root maggots. Rescue treatments that occur after the maggots are feeding inside a developing seed, however, tend to not be effective.

Can we monitor with traps? Could we increase the number of traps to provide control?

Research (Kuhar et al. 2006) suggests opportunities. They combined the traditional white or yellow sticky traps (Great Lakes IPM, or Gemplers) with a slow-release attractants ("Adult



*Seedcorn maggot adult flies are brownish gray flies that closely resemble common houseflies, except that they are about half the size.*

Maggot lure", from AgBio Inc.) Trap catch was increased significantly, and sex ratio more resembled what we'd expect from a field population.

Kuhar et al. 2006 suggested that a high enough density of these traps might actually control the population in smaller production areas, providing one option for organic growers, and anecdotal evidence suggest that this might be helpful. The concept makes sense: researchers have used olfactory attractants (blood meal, fish meal, onion pulp, yeasts, etc.) to increase infestation rates when running efficacy trials. This needs to be evaluated further; it is possible that attracting adults could make the problem worse. But it is worth trying.

(continued on page 18)

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## VEGETABLE PRODUCTION

## Managing Aphids in Early Season Tunnels

As some of you may already have noticed, aphids can survive in tunnels where crops were produced throughout the winter, and their populations can really start to increase at this time of year. Young seedlings and early-season tunnel crops being planted now are very susceptible to damage from aphid feeding, and must be protected. Scout now to catch problems before the population skyrockets, and consider using biocontrol organisms to maintain aphid colonies at non-damaging levels.

Correctly identifying the species of aphid affecting your crop is an important first step before selecting which biocontrol organisms will be effective:

**Green peach aphid:** This aphid species can be distinguished from the melon/cotton aphid by the length and color of the cornicles (the pair of tube-like protrusions extending from the end of the abdomen). Green peach aphids have long



*Green peach aphid winged and wingless forms. Photo: D. Ferro*

### Don't Transplant... (continued from page 17)

**Degree Days to estimate when the first adult flight tapers off** - The Northeast Network for Environment and Weather Applications (NEWA) has expanded to multiple sites in PA. For the onion maggot model select Jan 1 to current date and base 40°F for seed corn maggot (50° for cabbage and onion) at <http://newa.cornell.edu/index.php?page=onion-maggot>. You can also see a map of GDD base 40 at <http://apps.cei.psu.edu/proto/meteo/gdd40.html> or a map of base 50°F at <http://apps.cei.psu.edu/proto/meteo/gdd50.html> or check the PA-PIPE site at <http://pa-pipe.zedxinc.com/map/>.

Compare your local GDD to projected flights. Peak flight for seed corn maggot is 360 GDD (base 40F), 450-540 for onion maggot (base 50), and 450 for cabbage maggot (base 50).

**Nematodes for biological control** - Extension educator Tianna Dupont also summarized using *Steinernema feltiae* [Chen et al. 2003, Schroeder et al 1996]. As stated in her earlier report:

"*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 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."

*Dr. Fleischer is with the Department of Entomology at Penn State Univ. From the Vegetable, Small Fruit and Mushroom Production News, Penn State Extension, extension.psu.edu/vegetable-fruit/news, April 28, 2016.*

(approximately the length of the body) cornicles and only the tips are black. In addition, the head has a distinct indentation at the base of the antennae. Hosts include peach, apricot, and over 200 species of herbaceous plants including vegetables and ornamentals.

**Melon/cotton aphid:** The cornicles on melon/cotton aphid are short (approximately 1/3" or 8.0 mm, the width of the body) and vary in color from light yellow to very dark green (making them appear black). The antennae are typically shorter than the body. Melon/cotton aphids do not have a distinct indentation at the base of the antennae like that of the green peach aphid. Its host range includes hundreds of species such as pepper, eggplant, spinach, asparagus, okra, and it is particularly damaging on cucurbits.

**Foxglove aphid:** Foxglove aphids have green flecks located at the base of their cornicles. In addition, they have black markings on their leg joints and antennae. Foxglove aphids tend to fall off plants when disturbed and they can cause severe leaf distortion, more so than the green peach and melon/cotton aphid. This aphid has many hosts including foxglove, lettuce, potato, clover and bulbs.



**Potato aphid:** may be difficult to identify because their sexual forms produce both green and pink aphids, however they move more quickly than the other aphids. These aphids complete 2-6 generations on their winter host of rose plants before moving on to their summer hosts such as potato and tomato. Therefore, this aphid pest is not typically seen in tunnels until



*Melon aphids. Notice range in coloration, size, winged and wingless forms. Photo: Martin Spellman*

*Potato aphids. Photo: Joseph Berger*

later in the season but they have been reported as a growing problem among high tunnel tomato growers and keeping an eye out for them early is a good idea.

**Cabbage aphid:** Not typically considered a tunnel pest, this species has been reported recently in several tunnels where brassicas have been overwintered. Mature females are greyish green with dark heads and cornicles. They are approximately 1/12 inch long. Hosts are only the brassica species.

**Root aphid:** The primary root aphid (*Pemphigus species*) overwinters as eggs and infests plants in the spring and fall. Root aphids may be misidentified as mealybugs because they are covered with white wax although they are smaller than mealybugs. Root aphids have reduced cornicles that resemble rings, which are located on the end of the abdomen. These cornicles can be seen when magnified.

(continued on page 19)

## VEGETABLE PRODUCTION

**Managing Aphids...** (continued from page 18)

**Biological Control Using Parasitoids.** In general, parasitoids are more effective than predators (such as ladybeetles, green lacewings, and predatory midges) in reducing aphid populations, although parasitoids may fail to provide acceptable control under warm conditions or at times when aphid populations tend to increase rapidly. Parasitoids lay eggs inside aphids and when those eggs hatch, larvae feed on the aphid internally, killing it. Parasitoid larvae pupate within the dead aphid exoskeleton, which becomes a tan, dome-shaped shelter known as a "mummy." Adult parasitoids emerge from aphid mummies and continue the cycle. Aphid parasitoids are host-specific in terms of the aphid species they attack.

For example, *Aphidius ervi* attacks foxglove and potato aphid, while *Aphidius colemani* attacks both green peach and melon aphids.



Brown shell of mummified aphid with exit hole. Photo: A. Cavanagh

Currently no parasitoids are commercially available for cabbage and root aphids. Mixtures of different parasitoid species are commercially available and should be used when multiple aphid species are present. Parasitoids are shipped either as adults or 'aphid mummies' from which parasitoid adults soon emerge. To increase the parasitoids' effectiveness, place small groups of the aphid mummies in cups near aphid colonies. Do not let these aphid mummies get wet. Release rates may vary depending on the parasitoid species. Containers often contain approximately 250 aphid mummies, which can treat 5,000 ft<sup>2</sup> at the high release rate (for high aphid populations) or 25,000 ft<sup>2</sup> at the low release rate (for less severe outbreaks).

Greenhouse temperatures should be 65-77°F (18-25°C), with 70-85% relative humidity. Aphid parasitoids must be applied preventively to suppress aphid populations. They are less effective when aphid populations are high and already causing plant damage. Release parasitoids on a regular basis to sustain their populations during the growing season. Avoid releasing parasitoids near sticky cards to prevent capturing the released parasitoids. When scouting, look for aphid mummies that have circular holes on one end. These are the exit holes created by adult parasitoids during emergence. Aphid parasitoids are sensitive to pest control materials. Release parasitoids preventively on crops you know are susceptible to aphids, so that the parasitoids will be present when aphids are first noticed.

**Banker Plant Systems.** One of the challenges associated with trying to build up parasitoid populations before the pest aphids emerge are that they may leave the tunnel in search of food, however, there is a way to keep the parasitoid in your tunnels by giving them an alternate food source. Banker plant systems may be useful in controlling aphids and reducing the costs associated with applying pest control materials. Aphid banker plants are containers with winter barley, common rye or oats on which colonies of grass-feeding aphid species such as bird-cherry oat aphid (*Rhopalosiphum padi*) are established. Banker plants are primarily used to rear prey or hosts, in order to have a sufficient population of continually reproducing natural enemies. The bird-cherry oat aphid, however, is too small for the

parasitoid, *A. ervi*, to develop. *A. ervi* parasitizes larger aphids such as the foxglove or potato aphid. If foxglove or potato aphids are your predominant species, one option is to use the predatory midge, *Aphidoletes aphidimyza* for release onto your banker plants. If using predatory midges, placing the pots in trays with moist sand will help provide pupation sites for the predatory midges, which pupate in soil.

Banker plants need to be placed along walkways and at the end of benches. It is essential to evenly distribute them throughout a greenhouse. Some growers will place the banker plants in hanging baskets with drip irrigation to ensure that the banker plants will remain irrigated without inadvertently washing the parasitized aphids off of the plant. Distribute containers of rye or barley, with the grass-feeding aphid, among the main crop at a rate of one banker plant per 1,000 ft<sup>2</sup> even before aphids are detected. It should be noted that existing recommended rates may vary since limited research has been conducted; start with this rate and adjust in succeeding years based on your experience. Research with aphid banker plants in greenhouse pepper production in the Netherlands showed that when 4 banker plants per acre were introduced every two weeks, aphid pests were kept below threshold. With this rate and frequency of introduction of banker plants, the average number of *Aphidius* caught per sticky card (3.9" by 9.75") per week was 10 per card per week.

Banker plants may have to be placed closer together or placed in greater frequency within a given area in order to allow parasitoids such as *Aphidius colemani* to find prey on plants, since research has found that this parasitoid migrates just 3.2 -

(continued on page 20)

## HEALTHY PREDATORS, PARASITES ON PATROL

### Use Biocontrol To Stamp Out:

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## VEGETABLE PRODUCTION

**Managing Aphids...** (continued from page 19)

6.5 feet from the point of release. Occasionally, the banker plant aphids may be found on your main crop; this should not cause alarm, as they only feed on grasses, and it may be a sign that the pot of barley oats or rye has been fed on too heavily and needs to be replaced. It is helpful to start fresh pots of banker grass every 2 weeks to keep the aphids well fed.

Starter aphid banker plants are available from several biological control suppliers including BioBest and IPM Labs. One starter kit is enough to get your banker plant system started for the season, as long as you're growing your own pots of oat, rye or barley.

Tips for using Banker Plants:

- Place orders for banker plants up to 6 weeks before aphids are expected in your greenhouse.
- Transplant the plugs or seed directly into larger-sized pots (10 inch) so that the grass plants have plenty of room to grow.
- Wait one or two weeks for grass feeding aphid populations to grow.
- Lightly release the "aphid mummies" or *Aphidius colemani* adults onto the starter banker plants. For example, 100 hundred *Aphidius* per banker plant before it is divided and repotted. *Aphidius colemani* attacks the grass-feeding aphid, which is not an aphid pest of most greenhouse-grown crops except monocots such as ornamental grasses.
- Check banker plants weekly and look for newly parasitized aphids ("aphid mummies"), which indicate that the parasitoids are establishing on the banker plants.
- Start new banker plants every 2 weeks because they will decline from aphid feeding within a few weeks.
- Inoculate new banker plants by physically transferring aphids from old banker plants onto new ones every 2 weeks. This can easily be done by gently rubbing the aphid infested grass plants over the fresh banker plants.
- It may be necessary to "protect" or isolate your replacement banker plants from natural enemies (either established in your greenhouse or naturally occurring natural enemies that may enter the greenhouse from outdoors during warmer weather). If so, place banker plants in "starter cages" so you can build up your population of grass feeding aphids before releasing *A. colemani*.

For more detailed instructions please read this factsheet from UVM and BioBest at <http://extension.umass.edu/floriculture/sites/floriculture/files/pdf-doc-ppt/AphidBankerPlantSystem.pdf>.

Entomopathogenic fungus: The entomopathogenic fungus, *Beauveria bassiana*, is commercially available for use against aphids. However, because aphids have high reproductive rates and molt rapidly, especially during the summer, repeat applications are typically required. *Beauveria bassiana* is most effective when aphid populations are low. This fungus may not be compatible with the convergent ladybird beetle (*Hippodamia convergens*) depending on the concentration of spores applied.

Compiled by Susan Scheufele, UMass Extension From the following resources:

Aphids on Greenhouse Crops, by Tina Smith, UMass Extension, <http://extension.umass.edu/floriculture/factsheets/aphids-greenhouse-crops>;

Managing Aphids in the Greenhouse, by Leanne Pundt, UConn Extension, file:///C:/Users/veg.CAMPUS/AppData/Local/

Temp/Managing%20Aphids%20in%20the%20Greenhouse,%20by%20Leanne%20Pundt,%20UConn%20Extension.%20%20http://ipm.uconn.edu/documents/raw2/Managing%20Aphids%20in%20the%20Greenhouse/Managing%20Aphids%20in%20the%20Greenhouse.php%3faid=206;

Aphid Banker Plants, by Leanne Pundt, UConn Extension, <http://negreenhouseupdate.info/updates/aphid-banker-plants>.

Other helpful resources:

Aphid Banker Plant System for Greenhouse IPM: Step-by-Step, by Margaret Skinner & Cheryl Frank, UVM Entomology Research Lab and Ronald Valentin, BioBest, <http://extension.umass.edu/floriculture/sites/floriculture/files/pdf-doc-ppt/AphidBankerPlantSystem.pdf>;

Scheduling Biologicals, by Linda Taranto, D&D Farms and Tina Smith, UMass Extension, <http://extension.umass.edu/floriculture/sites/floriculture/files/newsletters/pdf/15FNJanFeb.pdf>.

From the **Vegetable Notes for Vegetable Farmers in Massachusetts**, Univ. of Mass. Extension, Vol. 28, No. 3, March 10, 2016.

## 2016 Mid-Atlantic Commercial Vegetable Production Recommendations Now Available

The updated vegetable recommendations are now available as a hardcopy for purchase or as a pdf download!

Although the annually updated content remains the same, the Pennsylvania Commercial Vegetable Production Recommendations now has a new name in 2016! The 2016 Mid-Atlantic Commercial Vegetable Production Recommendations name now reflects the joint efforts of Penn State, Rutgers, University of Maryland, University of Delaware, Virginia Tech and West Virginia University that have provided growers with the most up-to-date information intended to help commercial vegetable growers make informed managerial decisions. The recommendations are based on multi-state research results and extension programs as well as the knowledge and experience of growers, county extension educators, and industry personnel. Copies can be purchased at your local Extension office or ordered online or downloaded at <http://extension.psu.edu/publications/agrs-028/view>.

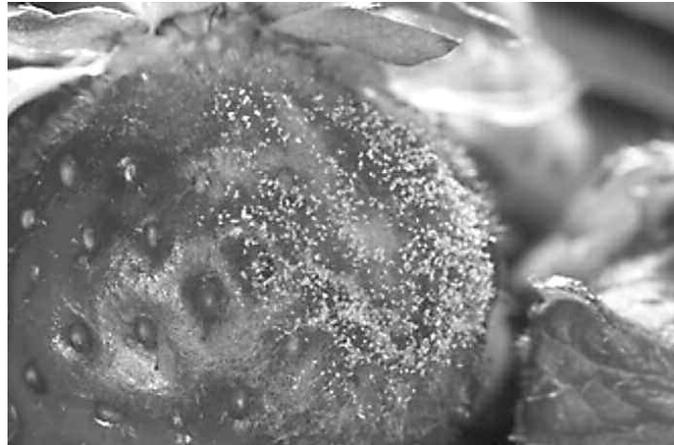
In addition to this production guide, Fungicide Resistance Management Guides for Vegetable Crops Grown in the Mid-Atlantic Region has also been updated. This guide should be used as a supplement to the 2016 Mid-Atlantic Commercial Vegetable Production Recommendations Guide to help growers make decisions on the selection of in-season vegetable disease management products and manage for the development of fungicide resistance through selection and rotation of products in different FRAC groupings. The guide is composed of a series of tables organized by crop group and contains a list of recommended products for select diseases along with the fungicide resistance action committee code information. It can be downloaded at <http://extension.psu.edu/plants/vegetable-fruit/production-guides>.

From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, [extension.psu.edu/vegetable-fruit/news](http://extension.psu.edu/vegetable-fruit/news), March 31, 2016.

# It's That Gray Mold Time Of Year And Fungicide Resistance Issues Abound

Cassandra Swett

Strawberries are blooming, the rain is falling and it's warming into the 60's and 70's—and as a plant pathologist, all I see is *Botrytis* spores dancing about the farm. We have already started to see *Botrytis* popping up on stem tissue and flower petals. Scouting for the pathogen in your fields will help inform you whether you need to spray.



*Botrytis cinerea* sporulation on a ripe strawberry. Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Preventing early flower and stem infections is critical to preventing *Botrytis* fruit rot.

To scout, look for grey fuzzy spores on dead tissue, especially near the base of the crown and on dead flowers under or touching the plastic. The warmer temperatures under the plastic encourage spore formation, even when it's cool.

A large number of farms in the mid-Atlantic region are experiencing problems with *Botrytis* strains (aka, individuals) that are resistant to one or more fungicides. The current status of fungicide resistance in the mid-Atlantic is shown in the graph below, based on seven Maryland Farms (tests run by Clemson, from March – April 2016).

Main issues of concern are:

- The increase in strains resistant to **both** compounds in Switch
- Elevate resistance
- Resistance to boscalid, which has been the more reliable of the two compounds in Pristine (most *Botrytis* stains are already resistant to the other Pristine product—pyraclostrobin, a strobilurin).

*(continued on page 22)*

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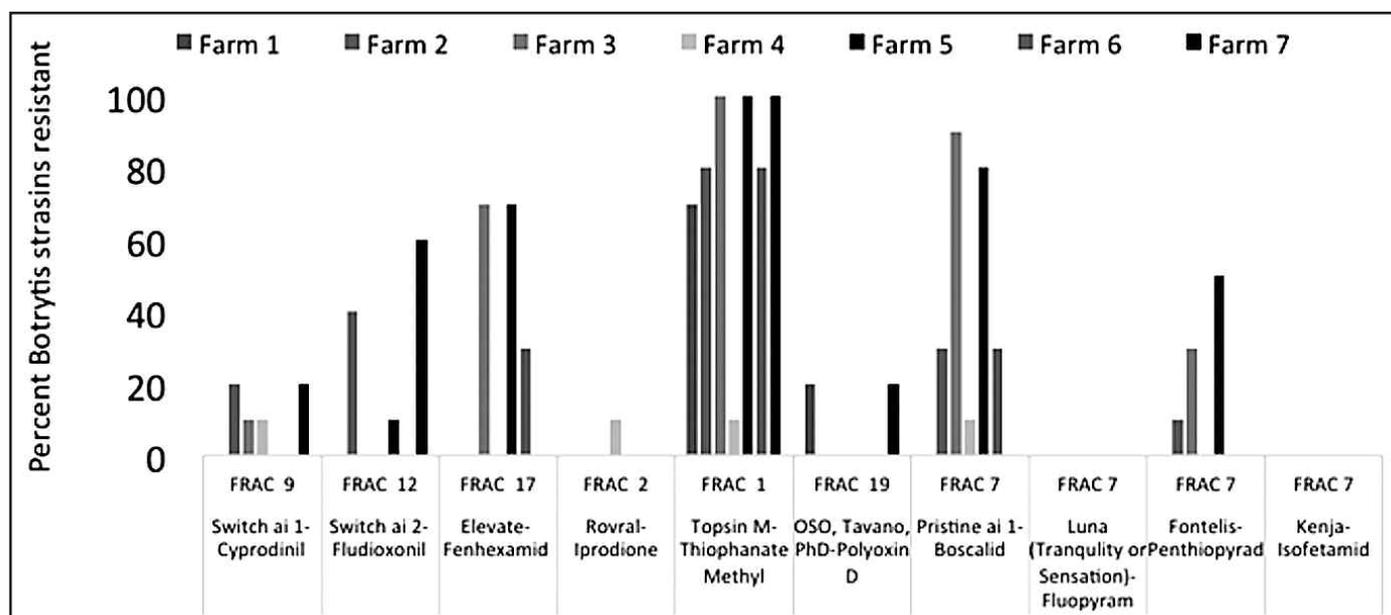
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BERRY PRODUCTION

*It's That Gray...* (continued from page 21)



Between the rains, fungicides are our main arsenal to protect plants against gray mold, especially during bloom.  
Photos: Cassandra Swett



This figure shows the percentage of Botrytis strains (aka, individuals) that are resistant to each fungicide, on each farm. Data courtesy of Dr. Guido Schnabel, Clemson University.

It is important to give these recommendations serious consideration:

- Limit the number of times fungicides in the same class are applied in one year.
- It is recommended that all strobilurin (FRAC group 11, QoI) products not be used for Botrytis control. That's Abound, Azaka, Cabrio, Pristine, Merivon and Quadris Top. On most farms throughout the east, these products are not effective against Botrytis, and are currently only recommended to control Anthracnose. To control both pathogens, this means that you need to combine a Botrytis-effective compound (like Captivate) with an Anthracnose-effective product (like Cabrio).
- Tank mix broad spectrum fungicides such as captan or Thiram with Topsin M—Topsin M no longer has Botrytis activity (as shown in the graph), but is helpful for several early season foliar diseases.
- Resistance profiles vary from farm to farm. Sample gray mold populations for their resistance through Clemson University. For instructions on how to submit samples

visit [http://www.clemson.edu/extension/horticulture/fruit\\_vegetable/peach/diseases/gm\\_collectioninstructions.pdf#new](http://www.clemson.edu/extension/horticulture/fruit_vegetable/peach/diseases/gm_collectioninstructions.pdf#new). Contact your local extension agent or extension specialist for assistance in sample submission.

- The current recommendation is to rely on captan and thiram as your main protectants.

Only add FRAC 7, 9, 17 or 19 to this base protectant only IF you have high risk situations. High risk occurs when plants remain wet for at least 12 hours, with temperatures above 65°F.

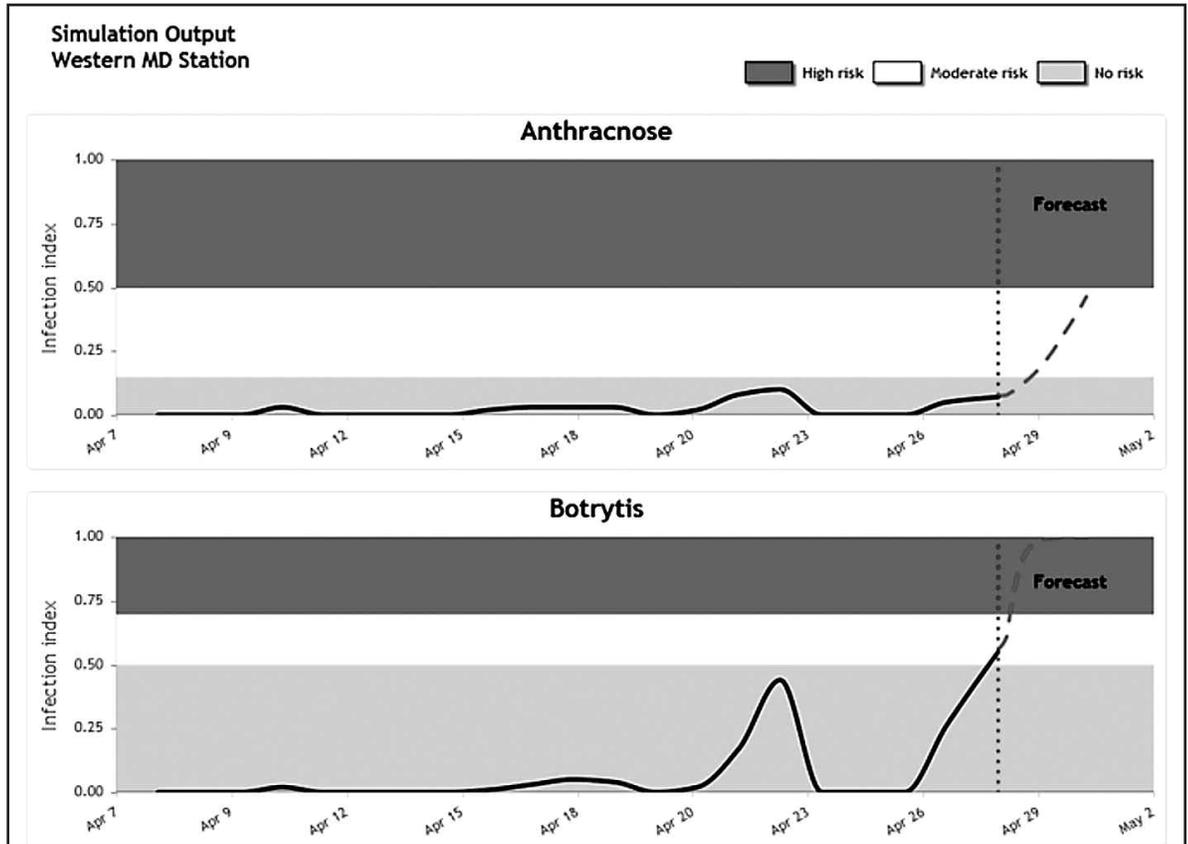
For now, you can estimate risk based on weather monitoring. We are currently working to bring a Botrytis and Anthracnose fruit rot risk evaluation tool to the mid-Atlantic. This tool, called the Strawberry Advisory System, will provide text and / or email alerts to risk events. An example of a risk monitoring is shown below for the Western Maryland Experiment station, from April 7 to April 28, with a two day forecast from April

(continued on page 23)

**BERRY PRODUCTION**

**It's That Gray...** (continued from page 22)

SAS-based risk evaluation for Botrytis and Anthracnose fruit rot.



29-30. We are currently testing this system in Western Maryland, and plan to expand to grower field trials next year in Maryland, Pennsylvania and Virginia.

Changes in fungicide efficacy are currently being incorporated into the mid-Atlantic Berry Guide. For this spring, we recommend that you refer to the Southeast strawberry IPM guide for the most current fungicide resistance management recommendations at <http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2016/2016SEStrawberryIPMGuide.pdf>. Take particular note of changes on pages 8 and 20.

It's been a bumpy spring for strawberries. At least it sounds like we are out of the frost and freeze events. There's always a silver lining.

Follow Dr. Swett on Twitter at [https://twitter.com/berry\\_pathology](https://twitter.com/berry_pathology)

Dr. Swett is the small fruit pathologist at the Univ. of Maryland. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, [extension.psu.edu/vegetable-fruit/news](http://extension.psu.edu/vegetable-fruit/news), April 29, 2016.



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## BERRY PRODUCTION

## Plasticulture Strawberry Variety Trial Report

Timothy Elkner and Kathleen Demchak

This planting was established in August 2014 and included 11 named cultivars with 'Chandler' and 'Sweet Charlie' as the standards for comparison. In addition, there were three advanced selections from the breeding program at Cornell and three advanced selections from the breeding program at Rutgers.

Back in December, Kathy Demchak reported on a matted-row strawberry variety trial at the Russell E. Larson Agricultural Research Center at Rock Springs. This is a report on the performance of many of these same varieties in a plasticulture planting at the Penn State Southeast Agricultural Research and Extension Center in Manheim, PA.

The Rutgers selections were specifically bred for plasticulture and were planted one month later than all others. Rows were on 6' centers and each plot was a double row of plants on a 12" x 12" spacing. Not all cultivars or selections were available as plug plants so those only available as dormant plants (Cornell selections, 'Daroyal', 'Donna', 'Galletta', 'Rubicon', and 'Sonata') were "plugged" by trimming the root system and growing them in 32-cell trays until planting time. The harvest season started dry with average temperatures and ended wet and with above-average temperatures. Minimal fungicides and no insecticides were applied during harvest.

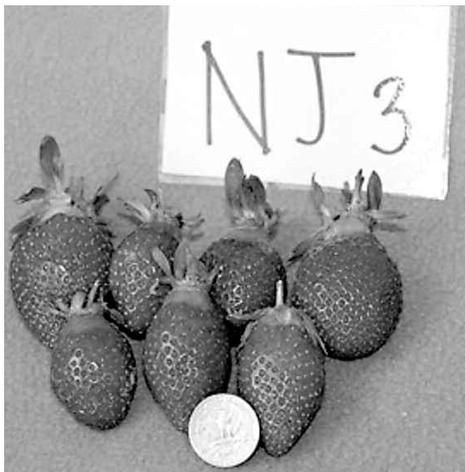
### Summary of the Characteristics of Each Variety

**Standards** - 'Sweet Charlie' performed as expected with low yields and good fruit quality. There was also some powdery mildew in the variety. 'Chandler' had disappointing yields that were lower than usually reported. This was a result of variable plant vigor as well as plant loss to *Phytophthora* root rot. In addition, this variety had the worst rating for angular leaf spot in the fall which also probably impacted yields.

**Order of Ripening** - As with the matted row planting, it was somewhat difficult to clearly list the order of ripening as many early varieties ripened simultaneously but there was evidence of cold-damaged flowers throughout the planting.

**'Florida Radiance'** (aka 'Radiance') - 'Radiance' is from the University of Florida breeding program and was developed for winter production on plastic. In our planting these plants were weak and were susceptible to leaf scorch. Total yields were low (7,182 lb/A) but berry size and appearance were very good. Flavor was poor.

**Rutgers Selections** - These varieties were bred for plasticulture and flavor was the main breeding objective. In our planting these varieties were planted one month after the other varieties because of propagation issues. We did carry the planting over for a second harvest so we should get a better idea of performance this season. All three of these selections had low yields. This is likely a combination of late planting and bird damage. However - these selections had the highest brix readings in the trial and as a result were rated the highest for flavor. Shape was somewhat unusual in two of the selections - berries were long and narrow - which may or may not be a marketing problem. Yields from the 3 selections were 3,292, 3,882, and 4,069 lb/A with excellent size and flavor.



Selection #3 from the Rutgers breeding program showing elongated fruit shape.

Photo: Tim Elkner

**'Earliglow'** - As in matted row culture, 'Earliglow' had excellent flavor but berry size dropped off quickly. The plants also had some powdery mildew in this planting. Total yield was 10,966 lb/A with 68% marketable and the brix was highest of all named varieties. Plant vigor was good and runner production in the fall was low.

**'AC Wendy'** - 'AC Wendy' is from the Agriculture and Agri-Food Canada-Nova Scotia breeding program. It had low runner production in the fall and was susceptible to leaf scorch and angular leaf spot. It was the highest yielding variety in the trial (15,535 lb/A with 60% marketable) but fruit quality was poor, especially during the heaviest harvest period. Fruit size also dropped quickly but was not as bad as with 'Earliglow'.

**'Galletta'** - 'Galletta' is from the breeding program at North Carolina State and was bred for plasticulture. Plants were vigorous but susceptible to powdery mildew and scorch. Yields were good at 10,565 lb/A with 64% marketable and very good berry size and flavor.

**'Flavorfest'** - 'Flavorfest' is from the USDA breeding program at Beltsville, Maryland, and was bred for both matted row and plasticulture. In our trial the plants had moderate vigor and low runner production. Some plants died from *Phytophthora* root rot. Yields were disappointing at 5,970 lb/A (63% marketable) but berry size and flavor were very good.

**'Daroyal'** - 'Daroyal' is from the Darbonne/Inotalis (France/Spain) breeding program. The plants were vigorous in our trial - perhaps lower N fertility should be used with this variety - and were susceptible to powdery mildew. Yields were good at 13,572 lb/A with 59% marketable. Berry size and flavor were good.

**'Donna'** - 'Donna' is from the same breeding programs a 'Daroyal'. It was also a vigorous plant and produced many runners in the fall. The foliage showed no signs of disease. Yields were moderate at 10,186 lb/A with 63% marketable. Fruit size was good and flavor was average.

**'Sonata'** - 'Sonata' is from Plant Research International (PRI) in the Netherlands and was selected for growing in the cool areas of western Europe. Under warm harvest seasons the fruit can be soft and we did see this trait in our trial. This plant is susceptible to many of our strawberry diseases. In our trial the plants were very vigorous with many branch crowns. Yields were very good at 15,337 lb/A with 52% marketable. Berry size was very good and quality was average. Harvest season was long and berries were soft in the heat of later harvests.

**'Rubicon'** - 'Rubicon' was selected at the Connecticut Agricultural Experiment Station for resistance to black root rot and black vine weevil. This variety was extremely vigorous in our planting. Yields were very good at 14,843 lbs/A and 68% marketable. Berry size was very good and flavor was average. We had problems with soft berries during the warmer late harvest season.

**Cornell Advanced Selections** - The three Cornell selections did better in the matted row trial than they did in the plasticulture trial. Yield in two of the selections were average (8,826 lb/A,

(continued on page 25)

BERRY PRODUCTION

# Your Help Needed with the Spotted Wing Drosophila (SWD) Impact Survey

Hannah Burrack

Spotted wing drosophila, or *Drosophila suzukii*, lays eggs in such valuable soft-skinned fruit as raspberries, blackberries, blueberries, strawberries and cherries. The eggs develop into larvae, leaving the fruit unmarketable.

The Specialty Crop Research Initiative (SCRI) project Sustainable Spotted Wing Drosophila (SWD) Management for US Fruit Crops, funded by NIFA, needs your help!

This four-year project, headed by Hannah Burrack at North Carolina State University, is developing national research and extension projects to minimize the impacts of SWD. They include new management tactics and programs, expanded pesticide registrations for SWD, and information and training on SWD for growers,



Spotted wing drosophila male (upper right on berry) and female (lower left). Photo by Kathy Demchak

extension agents, and others. In order to achieve this and ensure that the research and extension efforts match the needs of growers, the project is collecting information on the impacts of SWD on small fruit growers, current management practices and preferences, and your requirements for better management of SWD.

We would like to get feedback from as many growers as possible! Participation is voluntary, and **the survey does not collect personally identifying information**, and the data will only be analyzed and reported in aggregate form.

The survey takes on average 20-25 minutes to complete. Visit <https://survey.ncsu.edu/swd/> to complete the survey.

Dr. Burrack is with the North Carolina State Univ.. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, [extension.psu.edu/vegetable-fruit/news](http://extension.psu.edu/vegetable-fruit/news), April 19, 2016.

## Plasticulture Strawberry...

(continued from page 24)

63% marketable and 7,511 lb/A, 45% marketable) with very good berry size and average to poor fruit quality. The third selection had poor yields (4,558 lb/A, 50% marketable) with average berry size and quality. All three selections were soft during the warm late harvest season; we do not think these will be selections for growing in warm weather areas.

## Plans for 2016

This planting was carried-over for a second season of harvest. To examine the need/effect of renovation on yields and quality, half of the planting had 50% of the branch crowns on the plants removed by hand after harvest. Another benefit of carry-over is that it will allow us to continue to observe susceptibility to *Phytophthora* root rot which is found throughout the planting. Several plots in the trial are completely dead while others have minimal or no plant loss.

Both the 2015 trials and the planned 2016 trials are funded in part by the Pennsylvania Vegetable Growers Association. Dr. Elkner is with Penn State Extension in Lancaster County and Ms. Demchak is with the Department of Plant Science at Penn State Univ.. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, [extension.psu.edu/vegetable-fruit/news](http://extension.psu.edu/vegetable-fruit/news), March 31.

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## BERRY PRODUCTION

## New(er) Berry Crop Insecticides and Miticides, and a Couple of Subtractions

Kathleen Demchak

Last month, we discussed new herbicides that have become available for use on berry crops in the last few years. In this article, we'll cover changes with insecticides and miticides.

**Altacor** (chlorantraniliprole) is labeled for control of crown borer on caneberries, and should be applied as a delayed dormant spray for this purpose. Like Rimon, it has been available for use a few years, but is being mentioned because there are few products available for crown borer management. It works by causing insects to stop feeding and is effective on newly-hatched larvae. The stage that is being targeted in the spring is larvae overwintering in the soil before they bore into the canes. Sprays are directed to the base of the canes and should be watered in. This pest has a multiple-year life cycle, so applications will be necessary for more than one year to achieve control. It has a 1-day PHI and a 4-hour REI.

**BeLeaf** (flonicamid, Group 9C) is labeled for use on strawberries for control of aphids and for suppression of tarnished plant bugs. It has a 0-day PHI and a 12-hour REI. This product should be used while populations are still low. It causes the insects to stop feeding quickly, but there could be a lag between the time that the product is applied and insect numbers decrease.

**Exirel** (cyantraniliprole, Group 28) can be used on bushberries for control of spotted wing drosophila, cherry and cranberry fruitworm, blueberry aphid, blueberry maggot, plum curculio, and for blueberry gall midge suppression. It has a 3-day PHI and a 12-hour REI. It has been very effective against spotted wing drosophila in trials.

**Flubendiamide** (Belt) use can be continued while EPA's "Intent to Cancel Registration" filing for this product (due concerns about breakdown product toxicity to aquatic organisms) is under review. Uses that had been on other products containing flubendiamide as the active ingredient (Synapse, Vetica) now appear on the Belt label.

**Hero** (zeta-cypermethrin plus bifenthrin) has also been around for a few years, and is also of interest as it can also be used to control crown borers on caneberries. It is a restricted-use product, and like Altacor, is directed to the base of the canes, but is applied as a drench application. It can be applied in fall or spring. It has a 3-day PHI on caneberries. It also can be used on blueberries for an assortment of insects and mites with a 1-day PHI. The REI is 12 hours.

**Nealta** (cyflumetofen, Group 25) is a new miticide for use against two-spotted spider mites in strawberries. It is in a different chemical class than other miticides labeled for use on strawberries, and is easy on beneficials. As with other miticides, resistance development is a concern, so growers are limited to the number of applications that can be made per growing season – in this case, 2. The PHI is 1 day, and the REI is 12 hours.

**Rimon** (novaluron, Group 15) has been around for a few years, but is of interest because it can be used to control eggs and larvae of sap beetles on strawberries. It also can be used to control nymphs of tarnished plant bugs. On strawberries, it has a 1-day PHI. It also is labeled for use on bushberries (blueberries, elderberries, gooseberries, currants, etc.) with an 8-day PHI and can be used for control of cranberry fruitworm, oblique-banded leafroller, and blueberry maggot. It has a 12-hour REI. It interferes with growth of the insect, and thus is effective only on the eggs, nymphs, or larval stages of the insect's life cycle.

**Sivanto Prime** (flupyradifurone) is labeled for use on bush-

berries (blueberries, etc.) for control of aphids, blueberry maggot, and blueberry thrips with a 3-day PHI, and fruiting vegetables which includes gogi berry (it's in the tomato family) with a 1-day PHI. It also may be used on crops in the low-growing berry group (which includes lowbush blueberries and strawberries) for aphids, whiteflies, blueberry thrips and blueberry maggot (which are not problems on strawberries – this is just because of the crop grouping wording) with a 0-day PHI. The REI is 4 hours, though it is longer for certain operations with grapes and in California.

There are also several "softer" materials of interest:

**Azera** (azadirachtin plus pyrethrins) can be used in organic production. It is labeled for a wide range of crops and pests, and has a 0-day PHI and 12-hour REI.

**Captiva** (capsicum oleoresin extract plus garlic oil plus soybean oil) is labeled for use on a wide range of crops including all berries to repel and suppress soft-bodied insects and mites. It has a 0-day PHI and a 4-hour REI. Grandevo

**Grandevo** is a biological insecticide which is a fermentation product of a bacterium. It has a 2(ee) label for use against spotted wing drosophila on caneberries and bushberries, and can be used on strawberries to manage tarnished plant bug, aphids, thrips and whiteflies. On bushberries and caneberries, it is also labeled for use against fruitworms, aphids, and thrips. It has a 0-day PHI and 4-hr REI, and should be used when pest populations are still low and/or in younger growth stages.

**Venerate** (heat-killed *Burkholderia* spp. strain A396 cells and spent fermentation media) is a bioinsecticide. It should be applied early when pest populations are low and the pests are newly-hatched. On caneberries, bushberries, and strawberries, it is intended for control of various fruitworms and for suppression of aphids, thrips, and stink bugs. On strawberries, it is also intended for suppression of tarnished plant bugs. It has a 0-day PHI and a 4-hour REI.

Two products for which uses are being discontinued:

**Closer** (sulfoxaflor, Group 4C) had been labeled for use on strawberries, but last fall EPA issued a cancellation order for the product, after the federal Ninth Circuit Court of Appeals ruled that the EPA improperly approved the registration. Growers can use existing stock of product they already have for the uses appearing on the label, but will not be able to obtain new product at this time.

**Endosulfan** (Thionex, Thiodan) can only be bought for use on perennial (matted row) strawberries until May 31, 2016. It can only be used on perennial strawberries until July 31, 2016, where its main purpose is for control of cyclamen mites with applications made in early spring and/or at renovation. Use on other small fruit crops, including annual strawberries, has already been discontinued due to the fact that the active ingredient accumulates in the food chain.

As always, the label is the law - pesticides can only be used in the manner consistent with the product label. Products must be registered for use in the state in which they are applied. To protect pollinators, insecticides should never be applied during bloom, and precautions as listed on the label to protect pollinators should always be followed.

*Ms. Demchak is with the Department of Plant Science at Penn State Univ. From the **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, [extension.psu.edu/vegetable-fruit/news](http://extension.psu.edu/vegetable-fruit/news), April 11 and 12, 2016.*

# There's a Mouse in the (Green)house!

Lee Stivers

Insects, diseases and weeds aren't the only pests we encounter in greenhouses. Sometimes the damage we see to seeds, seedling and overwintering stock plants is caused by four-footed furry pests - rodents! This article discusses the two most common rodent pests of greenhouses, mice and voles, and how to control them.

Greenhouses provide wonderful habitat for rodents. Mice and voles can find ample supplies of food, water, warmth, and shelter as well as protection from predators inside a greenhouse. Rodent populations can explode under favorable conditions, and become even harder to control. Check early and often for signs of rodent activity in your greenhouses, and be prepared to take quick action.

## Mice Eat Seeds

Here in Pennsylvania the predominant species found in greenhouses are the white footed mouse and the closely related deer mouse. Both are in the genus *Peromyscus*, and should not be confused with the house mouse, *Mus musculus*.

White footed and deer mice have white feet, a white underside and brown upper surface. Their eyes and ears are relatively large, and their tails are long. Mice are mostly nocturnal. Adapted to outdoor conditions, these mice feed primarily on seeds, berries and nuts. In fact, research has shown that they will consume a significant number of weed seeds in crop fields. However, in greenhouses, they will uncover and feed on seeds and very small seedlings in greenhouse pots and trays.

## Voles Chew Leaves, Stems, Roots and Tubers

Voles are the other rodent commonly found in greenhouses. Members of the genus *Microtus*, voles suffer a bit of an identity crisis as they are frequently confused with mice, moles and shrews. In Pennsylvania, the most common are the meadow vole and the woodland or pine vole. Unlike moles and shrews, voles have rounded, blunt snouts and chisel-shaped front teeth, and their eyes and ears are readily apparent, although they are smaller than those on a mouse. Voles have shorter tails than mice, and no white coloring on their undersides.

Voles prefer grassy areas where they construct their extensive tunnels and runs, but they will also thrive among pots and flats in a greenhouse. They are most active in early morning and late afternoons. Voles feed on shoots of young plants as well as on roots, bulbs, tubers and rhizomes. They can be particularly problematic in overwintered perennials and other nursery stock, causing damage by their direct feeding as well as their chewing and tunneling through pots and flats.

## Controlling Mice and Voles in the Greenhouse

Monitor for mice and vole activity before populations build to levels difficult to control.



Exposed, chewed or missing seeds in greenhouse trays are signs of mouse activity. Snap traps are an effective control measure for mice and voles if populations aren't too large.

Tighten up the greenhouse to limit entryways. Note that mice can squeeze through holes as small as 1/4 inch. Small mesh hardware cloth can be placed around the outside of the greenhouse perimeter, with the bottom edge buried in the ground and bent away from the structure. Keep grass and other vegetation away from greenhouse perimeters.

Snap traps baited with peanut butter (mice and voles), oatmeal (mice) or apple (voles) can be effective for small populations. Repellents have not been shown to be consistently effective.

Toxic baits can be very effective, but must be deployed carefully in order to protect other animals and even children. Anticoagulant baits can be purchased off the shelf, but multiple feedings are usually required. Single dose baits with zinc phosphide as the active ingredient are restricted use materials and must be purchased and used by a certified pesticide applicator. Follow all label directions and precautions when using bait traps.

*Ms. Stivers is with Penn State Extension in Washington County. From the Vegetable, Small Fruit and Mushroom Production News, Penn State*

*Extension, extension.psu.edu/vegetable-fruit/news, April 28, 2016.*

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