

## 2015 PVGA Grob Memorial Scholarship Awarded to Nathan Sturges

The Pennsylvania Vegetable Growers Association is pleased to present a \$1,000 Rudolph Grob Memorial Scholarship to Nathan Sturges of Fombell, a senior at Penn State University.

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

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

- be the child or grandchild of an Association member who has been a member in good standing for at least one year
- be enrolled in a two-year or four-year degree program;
- be in good academic standing; and
- be intent on pursuing a career in the vegetable, potato, or berry production industries.

Normally, one scholarship is awarded each year although for 2011, 2012 and 2013 two scholarships were awarded  
*(continued on page 2)*

## Assessing a Potential Recall - What Matters? What Doesn't?

Amy Philpott

### How a Recall Unfolds, Part 3: Understanding the Situation

*This is the third article in a special, six-part series called "How a Recall Unfolds," which explains the recall process and offers practical tips on how to prepare for and survive a product recall. It is part of a Specialty Crop Block Grant project designed to help Pennsylvania vegetable growers be prepared to deal with a recall situation.*

A farm's recall plan (discussed in Part 1) should help guide it through the recall response process, which is made up of roughly five steps: gathering information, assessing the situation, making the decision, carrying out the recall and terminating a recall. All too often plans incorrectly begin with executing the recall, when arguably the most important work is done in advance of making the actual decision to recall.

Gathering information (discussed in Part 2) should be the first order of business after learning of a potential product issue. It is also a good time to review the list of consultants in the recall plan, and determine if subject matter experts can help with the information gathering process.

Even after the farm has collected all the available information, knowledge gaps will exist and the assessment will ultimately be done with incomplete or imperfect information. Nevertheless, the recall team will have to assess what is known, what matters and what doesn't matter in order to decide whether to issue a recall.

Based on the information gathered, determine the seriousness of the situation as this will determine how quickly the farm

will have to act. Never allow one individual to determine the seriousness of an incident without consulting others.

Threshold questions:

Use these questions as an assessment guideline to determine how serious the situation is:

Is the product unsafe for consumers?

Is there loss of life?

Is there serious injury requiring hospitalization?

Have any federal, state or local laws/regulations been breached?

Have there been inquiries from the media?

*If the answer to any of these questions is "yes," the situation should be considered serious, and the farm will need to move forward quickly (part 4) and act decisively (part 5).*

One of the challenges during the assessment stage is to distinguish information that matters from information that doesn't.

What doesn't matter: Negative tests of a lot or product that has tested positive do not matter. Even if the farmer sampled a lot before it left the packing house and the test results were negative, if product in that lot tests positive later on, those negative test results do not matter. For the same reason, it is likely not worth testing the retained samples from that lot because the result will not matter. A single credible positive test result trumps any number of negative results. The other factor that is often raised during the assessment stage is the product shelf-life. If the product is well beyond its product shelf life, this may

*(continued on page 6)*

## NEWS



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## 2015 PVGA Grob Memorial... *(continued from page 1)*

because there had been a backlog of three scholarships that were not previously awarded.

Nathan has lived and worked on his family farm all his life. The Sturges grow 65 acres of various fruit and vegetable crops on their farm in Beaver County. He has been involved in the planting, maintaining, harvesting, and selling of vegetable crops. Before he could drive, he was running his own farmers' markets stands and now goes to farmers' markets five days a week. He has seen increased consumer support for farmers' markets in recent years.

Nathan, the son of Aaron Sturges, is majoring in Horticultural Sciences at Penn State but has also worked with making jams, jellies, apple butter, cider and smoothies to add-value to the raw products produced on the family's farm. He hopes to expand the vegetable acreage of the farm to meet the growing demand at their farmers' market stands. He finds the gratitude that customers have for farmers making fresh local produce available to them particularly fulfilling to him.

PVGA is pleased to present the 2015 Grob Memorial Scholarship to Nathan. Applications are now being accepted for the 2016 scholarships and are available by contacting PVGA at 717-694-3596 or [pvga@pvga.org](mailto:pvga@pvga.org). The deadline is March 31, 2016. Applications are reviewed by the Association's Scholarship Committee which determines who receives the scholarships. The current committee members are: Carolyn Beinlich, Keith Eckel, Curtis Kaelin, Michael Orzolek, Hilary Schramm, Jr. and Randy Treichler

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



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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.

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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.

## Dairy Farmers Also Need immigration Reform

Half of all workers on U.S. dairy farms are immigrants, and the damage from losing those workers would extend far beyond the farms, nearly doubling retail milk prices and costing the total U.S. economy more than \$32 billion, according to a new report commissioned by the National Milk Producers Federation.

The report, which includes the results of a nationwide survey of farms, found that one-third of all U.S. dairy farms employ foreign-born workers, and that those farms produce nearly 80 percent of the nation's milk.

It concluded that a complete loss of immigrant labor could cause the loss of one-in-six dairy farms and cut U.S. economic output by \$32.1 billion, resulting in 208,000 fewer jobs nationwide. Some 77,000 of the lost jobs would be on dairy farms.

Retail milk prices, the report said, would increase 90 percent if all immigrant labor was lost. That would drive the supermarket price of a gallon of milk, which averaged \$3.37 in June, to approximately \$6.40.

The survey, an update of one done in 2009, was conducted last fall, before immigration became a hot-button issue in the presidential campaign. A comparison of the two surveys shows the number of immigrants working on dairy farms increased by 35 percent, or nearly 20,000, in six years. The portion of the milk supply coming from farms with immigrant labor increased by 27 percent.

The survey results do not distinguish between documented and undocumented foreign-born workers, but 71 percent of survey respondents said they had either low or medium level of confidence in the employment documents of their immigrant workers. As a result, the report said, a majority of dairy farmers are very concerned about actions such as immigration raids or employee audits. Despite this, 80 percent of dairy farms surveyed continue to hire immigrants.

"This report reinforces the urgent need for Congress to address this issue," said NMPF President and Chief Executive Officer Jim Mulhern. "Farms that rely on hired foreign workers need their current labor force as well as an effective program to ensure an adequate future workforce. And the way to do that is to enact comprehensive immigration reform."

## National News Briefs

### WOTUS Halted in 13 States

A federal judge in North Dakota blocked the implementation of the new "waters of the U.S." rule in 13 states.

The preliminary injunction issued the day before the rule was set to take effect governs North Dakota and a dozen other states that sued the Environmental Protection Agency, claiming the agency overstepped its jurisdiction in crafting the WOTUS rule. Pennsylvania did not join the lawsuit.

In granting the preliminary injunction, Judge Ralph Erickson wrote that states suing the EPA are likely to succeed because it appears the agency exceeded its authority in creating the rule. According to published reports, EPA officials say the ruling only applies to the 13 states that brought suit against the agency.

"In all other respects, the rule is effective on August 28," EPA spokeswoman Melissa Harrison was quoted as saying in *The Hill*. "The agencies are evaluating these orders and considering next steps in the litigation."

PFB President Rick Ebert believes the EPA should halt further action on the rule.

"While EPA tries to posture the legal impact of the ruling on Pennsylvania and other states, it received a clear and well-reasoned directive from federal court that it will likely lose its case against challengers to the WOTUS rule," Ebert said. "A prudent

"The notion that immigrants are taking these jobs away from American workers is simply not true," added Randy Mooney, a dairy farmer from Rogersville, Missouri, and the chair of NMPF's board. "Dairy farmers have tried desperately to get American workers to do these jobs with little success — and that's despite an average wage that is well above the U.S. minimum wage."

The report was produced for NMPF by Texas AgriLife Research at Texas A&M University. Researchers estimated that 150,418 employees worked on U.S. dairy farms in 2013, and that 51 percent of them, or 76,968, were immigrants. It found the average hourly wage on dairy farms in 2013 was \$11.54, 16 percent higher than in 2008. By comparison, the federal minimum wage is \$7.25 per hour.

The report concluded that a total loss of immigrant labor would reduce the size of both the U.S. dairy herd and the nation's milk production by nearly a quarter. More than 7,000 dairy farms would close, it added.

Through economic modeling, researchers estimated that more than a third of the total economic damage from losing all immigrant labor on dairy farms would be from reduced farm milk sales. The rest would come from losses in employee compensation, reduced purchases by farm employees and lost sales to businesses that support dairy farms, such as feed and equipment dealers.

Likewise, researchers said, milk sales support many more jobs beyond the farm than on the farm. As a result, while a total loss of immigrant labor on dairy farms would mean 76,968 fewer people working on farms, it would also mean the loss of 131,240 jobs outside the farm.

Mulhern added that Washington's failure to act on immigration reform is also preventing economic growth and job creation in other ways. "The lack of a reliable source of workers is causing farmers to second-guess decisions to expand," he said. "That's economic activity that's lost to both rural and urban communities — all because Washington won't act on immigration reform."

*From the National Milk Producers Federation.*

agency should be very reluctant to move forward with any plan to implement or enforce a regulation that a competent court has initially found to be illegal until the legal process in the North Dakota case is fully completed. We hope and expect EPA to be prudent in putting this illegal rule on hold nationwide."

The rule significantly expands federal authority under the Clean Water Act, and as a result virtually all of Pennsylvania's land mass can be claimed by EPA officials as "regulated water." Farm Bureau believes the EPA is making a shaky argument by moving ahead with enforcement in other states.

"Even in the face of this court order, EPA is reportedly asserting it will enforce the new rule in the 37 states that are not part of the North Dakota lawsuit. Thus, for much of the nation, this unlawful rule will continue to create uncertainty and legal risk for commonplace land uses like farming," said American Farm Bureau Federation President Bob Stallman.

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

### EPA Defied Government Concerns

A series of internal memos are significantly undermining the credibility of the Environmental Protection Agency's efforts as it created sweeping water regulations.

*(continued on page 4)*

## NEWS

**National News Briefs** *(continued from page 3)*

The documents released by the House Committee on Oversight and Government Reform show the Environmental Protection Agency ignored several legal, technical and scientific concerns outlined by the U.S. Army Corps of Engineers as it drafted the “waters of the United States” rule.

In fact, one memorandum suggested the Corps should withdraw its name and logo from the WOTUS rule altogether. The flawed rule gives sweeping new powers to the federal government to regulate small water bodies and dry land. However, there is not a universal belief between the agencies that the federal government has the Constitutional power to enforce the rule.

One internal Corps memo suggests the final rule is “legally vulnerably, difficult to defend in court, difficult for the Corps to explain and challenging for the Corps to implement.”

The 50 pages of documents confirmed Farm Bureau’s belief that the WOTUS rule makes it impossible for anyone to know what types of water and land features will fall under federal jurisdiction.

Equally troubling is the entire economic analysis used to support the rule has no factual basis in science or economics according to the Corps memos.

“It is clear from the memos that there were dire concerns internally that EPA was getting it wrong and with a high degree of arrogance,” said American Farm Bureau Federation President Bob Stallman. “The flawed economic study is just the tip of the iceberg, and it was known internally that trouble was ahead. In fact, the memos themselves were stamped ‘Litigation Sensitive.’ They were never intended to see the light of day.”

These memos damage the EPA’s credibility in drafting the rule and shows that politics played a key role in the final regulations, said Don Parrish, senior director of regulatory relations at AFBF.

“As to whether or not this is truly a smoking gun, we think it is,” Parrish said. “We think the agencies’ credibility is shot, or at least EPA’s credibility.”

Farm Bureau, along with 29 states, sued in federal court to force the EPA to abandon the rule, arguing it violates limits put in place by the Clean Water Act. Farm Bureau hopes the documentation will compel the EPA to start over on the WOTUS rule and draft regulations that are reasonable and balanced, Parrish said. Above all, the documents show there is still much more to be learned about the behind-the-scenes work that went into creating the rule.

“U.S. Army Assistant Secretary Darcy pleaded with Congress to keep these memos from the public eye. Well, now we know what they say, and we want to know more. What other internal agency documents are out there?” Stallman said. “If the Corps’ economists objected so strongly, what did the EPA’s economists think? What else are these agencies hiding from the public? As Americans, we expect better, but during the entire WOTUS rulemaking process, we got worse – much, much worse.”

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

**Farm Bureau Pushes Back on WOTUS Rule**

In the days leading up to the “waters of the U.S.” rule taking effect, Farm Bureau participated in a full-court press urging Congressional action on legislation that would send the Environmental Protection Agency back to the drawing board. During Ag Progress Days, nearly 300 visitors to our building

submitted cards that were delivered to Sens. Bob Casey and Pat Toomey asking for them to support legislation that would stop the EPA from enforcing the rule.

The EPA expanded the scope of area it may regulate as water under the Clean Water Act and is claiming jurisdictions over nearly every Pennsylvania land area. During Ag Progress Days, PFB highlighted new maps prepared by Geosyntec Consulting for the American Farm Bureau Federation showing the scope of how much land and water will now be regulated by the EPA.

Under the WOTUS rule:

All perennial streams will become regulated, along with a 100-foot-buffer surrounding them. This accounts for 7 percent of the state’s land mass.

All water, including wetlands, located even partially within a tributary’s 100-year floodplain up to 1,500 feet will fall under federal jurisdiction. This is 81 percent of the state’s landmass.

The rule also gives the EPA jurisdictional flexibility on a case-by-case basis on water and land features within 4,000 feet from a tributary that is in some way connected to downstream waters. This impacts 99 percent of the state’s landmass.

“The rule is extremely complicated and confusing, but also vague, granting EPA unlimited power to determine whether any track of land is subject to new regulations. For farmers, it could mean new requirements for federal permits, restricting farming on existing land and severe penalties for using crop protection tools that are safe, scientifically sound and federally-approved,” said PFB President Rick Ebert.

Visit PFB’s website at [www.pfb.com](http://www.pfb.com) to view a fact sheet created by Farm Bureau to help farmers understand the new rule.

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

**Bill Could Help With Motor Carrier Regulations**

Pennsylvania Farm Bureau is supporting legislation that would give farmers relief from some Federal Motor Carrier Safety Administration regulations. H.R. 3473, introduced by Rep. Lou Barletta, a Pennsylvania Republican, would give states the ability to provide agriculture exemptions for covered loads. FMSCA argues that it can withhold funding to states if they try to provide equipment or operation standards for farm vehicles that the agency considered to be less stringent than federal regulations for commercial trucking. Farm Bureau believes the agency is interpreting current standards much more narrowly than Congress intended. “It’s regulatory overkill to require farmers using their trucks to local supply stores and markets to meet the same recordkeeping, verification and other ‘safety’ requirements as those imposed on commercial trucking companies transporting goods cross-country,” said Pennsylvania Farm Bureau President Rick Ebert. PFB had been working with the Pennsylvania General Assembly to provide farm exemptions from covered load provisions, but there was concern at the state level over the possibility of losing federal highway funding if such a bill is adopted. Barletta’s legislation contains the same language as an amendment that Sen. Patrick Toomey introduced over the summer. Farm Bureau is asking lawmakers to support the legislation to provide states with the flexibility to adopt standards that support agriculture producers.

*From **Farm Bureau Express**, Penna. Farm Bureau, Sept. 11, 2015.*



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## NEWS

## State News Briefs

### Penn State Ag Law Center Adds Shale Focus

Penn State is expanding its agriculture law center to reflect the growing interest of shale gas development in the Keystone State. The recently renamed Center for Agricultural and Shale Law will continue to offer research and outreach on legal issues impacting agriculture and natural gas development.

“Our focus has always been on rural communities,” said Ross Pifer, who directs the Center for Agricultural and Shale Law. “Agriculture and shale issues have become such an important part of the issues facing rural communities.”

The center operates much like Penn State Extension by disseminating research and holding presentations and workshops on agriculture and mineral resource law. The center’s website contains an online reference library on common agriculture legal issues, such as Clean and Green and the ACRE law. Natural gas extraction, and the legal issues surrounding drilling and pipeline development, has been a growing issue facing landowners over the past five years. As a result, Penn State’s law center has had to grow and adapt, Pifer said.

The center recently hired a new attorney, M. Sean High, who will act as the lead researcher at the center and will direct its outreach strategy. High will focus on landowner issues, statutory protection of agriculture and business planning and will also send research compiled by the center to attorneys and other stakeholders.

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

### Assessing a Potential... *(continued from page 1)*

affect the need for a press release, but the U.S. Food & Drug Administration (FDA) will still likely want the farmer to issue a recall to the customer level.

**What matters:** Factors that influence the assessment are regulatory obligations, hazards and risk perceptions.

The regulatory lawyer can help determine the farm’s regulatory obligations. Assess whether the situation requires immediate notification of proper authorities or an immediate administrative action (e.g. withdrawal of a product or temporary closing of a facility)? Understanding the farm’s regulatory obligations is paramount because not meeting them could result in civil and even criminal penalties. The farm’s recall decision will most certainly have to take these obligations into consideration.

When assessing the situation, keep in mind that the farm, its customers and consumers may view risk differently. According to Peter Sandman, a former Rutgers University professor and one of the preeminent risk communication consultants, risk is made up of two components: hazard and outrage. Hazard is the scientific, often quantifiable facts about the risk, and outrage is the emotional reaction to the risk. As Sandman points out, our companies often “see ‘risk’ as ‘probability x magnitude,’ whereas for most people risk means ‘outrage.’”

Outrage includes factors such as whether the risk exposure is involuntary or not; the potential consequences of exposure; and whether the risk was generated by negligence, a deliberate act or an act of nature. In the case of food recalls, the risk is almost always viewed as involuntary – that is, the consumer has no choice in whether they are exposed to the risk because it is assumed that all food for sale is safe to eat. In the 2009 salmonellosis outbreak associated with products from Peanut Corporation of America, the outrage was very high because the risk exposure was involuntary; the potential consequence was

### Farm Bureau Urges Support for On-Farm Energy Generation

Pennsylvania Farm Bureau (PFB) is encouraging state lawmakers to support legislation that would prevent the Pennsylvania Utility Commission (PUC) from restricting the ability of working farms to generate electricity from renewable energy resources on their farms.

In testimony presented yesterday before the Pennsylvania House Consumer Affairs Committee, PFB expressed concerns over regulations proposed by the PUC that would restrict the future development of renewable energy on farms. PFB is concerned the PUC could curtail renewable energy generation on farms by significantly restricting a farmer’s ability to use net metering as a way to repay the cost of developing a system.

PFB supports House Bill 1349, which would prevent the PUC from putting caps or limitations on farmers who generate electricity through methane digesters, but recommended that lawmakers provide a broader exemption to farmers generating electricity from other renewable sources, such as wind and solar, to meet the farm’s energy needs. Last year, the PUC proposed standards that would limit the generating capacity of systems whose sale of electricity to electrical companies qualifies for net metering—which helps pay for the expense of building renewable energy systems. Working farms use much of the electricity these systems generate. The regulations were proposed by PUC to prevent public utility companies from receiving

*(continued on page 8)*

death, illness or injury; and the company was found to have knowingly shipped contaminated product.

Not all potential recalls are of the same magnitude, but underestimating negative public reaction, or outrage, can cause long-term damage to reputation. While farmers expect that the hazard, or scientific, information will impact the recall decision, they are often surprised at how the outrage factors can impact their decision. There have been cases in which produce companies (not named for confidentiality reasons) have issued recalls in which FDA did not require more than just a small amount to be recalled, but the company recalled up to three times that amount to avoid potential consumer outrage. The lesson is that it is important to assess both hazards and outrage factors because these components of risk can affect the recall decision.

For each situation, the recall team will need to assess the information that is available. In cases where there are negative regulatory implications and/or a clear and present public hazard, the decision to recall is definitive. However, in many cases, the situation assessment is not clear and other factors such as outrage influence the process. Despite any situational uncertainty, the farm will likely need to gather information, assess the situation and make the decision whether to issue a voluntary recall within hours of learning of a potential problem.

*Coming Next Month: To Recall or Not to Recall, and Other Important Decisions. How a Recall Unfolds, Part 4: Making the Decision* Amy Philpott specializes in reputation management and risk communications in the food and agricultural sectors. She works at Watson Green LLC, a public communications firm in Washington, DC, and is an instructor in the United Fresh Recall Ready Program ([www.unitedfresh.org/recallready](http://www.unitedfresh.org/recallready)). Amy can be contacted at [aphilpott@watsongreenllc.com](mailto:aphilpott@watsongreenllc.com).

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## NEWS

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

ing net metering treatment through legal loopholes but the regulations will also thwart future development of on-farm energy generating.

Farmers have developed renewable energy systems to help them take control of their utility costs and, in the case of methane digesters, better manage nutrients and protect the environment. Net metering has helped reduce the cost of building renewable energy systems and manage the overall cost of operating a farm, said Grant Gulibon, PFB's Director of Regulatory Affairs.

"Farmers need to make substantial on-farm income to repay the significant debt incurred in their construction and operation of renewable energy systems," Gulibon said. "Net metering plays an important role, not only in increasing farmers' ability to show potential financiers that the generating system will improve the farm's income potential, but also in allowing the farmer to obtain more feasible terms of financing and repayment of debt."

Farm Bureau told lawmakers that HB 1349 is a good first step in addressing the underlying problems in the PUC proposed net metering rules, but suggested amending the language to include an agriculture exemption for energy generated through wind and solar.

From *Farm Bureau Express*, Penna. Farm Bureau, Sept. 11, 2015.

**REAP Applications Now Available**

Pennsylvania farmers who want to use the Resource Enhancement and Protection (REAP) tax credit program can begin submitting applications. However, applications will not be acted on until the state budget is adopted. REAP provides tax credits for farmers who install best management practices or purchase equipment that reduces erosion or prevents nutrients from reaching waterways. The program is run by the State Conservation Commission. Farmers who have completed projects can now start submitting applications; those with proposed projects can submit applications on August 17. Investors can also act as a sponsor of the project and provide funding in return for tax credits. Since its inception in 2007, REAP has awarded tax credits to 3,900 projects totaling \$50.7 million. Farms can receive tax credits of up to \$150,000 for 50 to 75 percent of the total project costs. Common projects approved through REAP include the purchase of no-till equipment, manure storage, nutrient management plans and improving heavy animal use areas. For more information, or for an application, call Joel Semke at 717.705.4032 or [jsemke@pa.gov](mailto:jsemke@pa.gov).

From *Farm Bureau Express*, Penna. Farm Bureau, Sept. 11, 2015.

**Tough Time Recycling Ag Plastic in Pennsylvania**

Agriculture plastics have become a vital tool on farms, including for irrigation, weed control and covering silage. But farmers are confronted with

questions of what to do with the material once the season is over. The most commonly used methods of disposing of agriculture plastics are burying, burning, or sending them to a landfill.

There are few locations in Pennsylvania that will recycle agriculture plastics. (*Editor's Note: See ad for Zooks Plastic Recovery on page 13.*) This is mainly due to the market that these plastics can be sold to. If there isn't a market for the plastic to go, these companies will not be able to take it.

There are several issues with trying to recycle agriculture plastic in Pennsylvania. These include finding space to store the large amount of plastic on a farm, locating a business that will take the specific types of plastic and figuring out a way to transport plastic from the farm to the business. In addition, there are normally specific criteria to meet with the cleanliness of the agriculture plastics.

One successful program in Pennsylvania that recycles pesticide containers is the Plastic Pesticide Container Recycling Program. This program is run by the Pennsylvania Department of Agriculture and has 66 recycling partners that serve as drop off sites. Since its beginning in 1993, this program has recycled nearly 2 million pounds of plastic and in 2013 alone, collected more than 125,000 pounds of plastic. These plastics can be recycled into drain pipe, fence posts, pallets, and several others uses.

One of the leading states in recycling agriculture plastics, New York, has overcome most of the challenges that Pennsylvania faces. Unlike Pennsylvania, in 2009, New York passed a ban on burning agriculture plastics. This made finding alternate methods of dealing with ag plastics a must. New York created the program, Recycling Agricultural Plastics Program (RAPP). It's currently funded by New York State Department of Environmental Conservation and is a program of Cornell University.

Before starting the program, they made sure there was a market to sell agriculture plastic. Then, they held educational programs for farmers around the state to learn about the requirements for cleanliness of used plastics and placed mobile balers in different counties. In the first four years, RAPP has collected and shipped around 1.25 million pounds of plastic and keeps growing.

(continued on page 9)

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NEWS

**State News Briefs** *(continued from page 8)*

When a farmer has enough plastic for the mobile baler, they call the local extension office or the Soil and Water Conservation Districts to bring the machine. Farmers still have limited space on their farm to store plastic, but RAPP sends out recycled fertilizer bags to help store used plastic. In addition, they suggest to farmers that they cut large slabs of plastic such as bunk silo covers into three or more sections to eliminate the need for more space. Although they have tackled many challenges, they still face the issue of being able to collect agriculture plastics efficiently due to the large number of farms needing assistance. To learn more about the pesticide container recycling program run by Pennsylvania Department of Agriculture call: 717-787-4737

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



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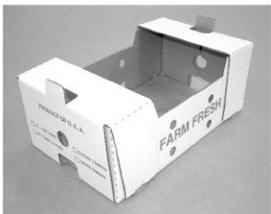
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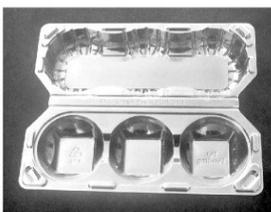
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GENERAL

# Do You Need A Pesticide License?

Emelie Swackhamer

If you are considering using a pesticide, it is important to make sure you are in compliance with Pennsylvania law.

The words **RESTRICTED USE PESTICIDE** appear at the top of the label of restricted use products. This product is toxic to fish and waterlife, it can only be used by a Certified Applicator.

If you are not sure what you intend to do is legal, make the effort to find out for sure before you get into trouble with the Pennsylvania Department of Agriculture (PDA). The rules apply to all Environmental Protection Agency (EPA) registered pesticides, including registered pesticides allowed for organic production.

There are two major distinctions used to decide if you need a license or not. There are additional criteria to consider, but if you know the status of these two things, you will be on your way to knowing what you can legally do.

Pesticide licensing requirements are partially determined by the status of the land where an application will be made. Do you own or rent the land?

Licensing requirements are also partially determined by the type of pesticides you want to use. Is the pesticide classified as "general use" or "restricted use?" The words **RESTRICTED USE PESTICIDE** appear at the top of the label of restricted use products. You can find labels online to search for this designation, or ask your pesticide supplier. Also, you cannot purchase a restricted use pesticide if you do not have a pesticide license from PDA.

Once you know the status of the land and the classification of pesticide, you can understand how your situation fits into our pesticide laws. Below are the basic types of licenses for pesticide applicators, but be aware that some special exceptions and rules may apply—for example if the application will be made at a school, daycare, public swimming pool, parks, golf courses. Check the PA Code, Chapter 128-Pesticides, Section 41 for the complete list (<http://www.pacode.com/secure/data/007/chapter128/chap128toc.html#128.41>).

**No License Required**

If you or your employer owns or rents the land and you will only use general use pesticides, you do not need a pesticide license.

**Private Applicator License**

Is required to use restricted use pesticides to produce an agricultural commodity on land that you or your employer owns or rents.

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benzeneacetate	8.4%
Inert Ingredients*	91.6%
<b>Total</b>	<b>100%</b>

**Commercial Applicator License**

Is required to use any type of pesticide on property not owned or rented by the applicator or the employer of the applicator. All commercial applicators must be certified in at least one of 26 categories of specialty (for example, Vegetable Crops, Fruit and Nuts, Lawn and Turf, etc.). There are provisions for non-licensed technicians to operate under the supervision of a commercial applicator providing all of the requirements to register and train the technician are satisfied.

**Public Applicator License**

Required for someone who applies pesticides as an employee of the state or its instrumentalities or any local agency.

**Business License**

Is required for any business or agency that employs commercial or public applicators. To obtain this status, businesses must meet all licensing and insurance requirements.

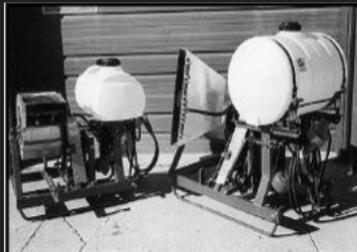
**Other Things to Note**

There are laws for record keeping for both private applicators who apply restricted use pesticides and for commercial and public applicators. Also, commercial or public applicators must comply with the rules of the Hypersensitivity Registry which includes procedures for notification of listed individuals.

If you have any special concerns or situations, and need help to be sure of the licensing you must have, call your regional PDA office. They will help you interpret the law so you can be sure you understand what you have to do.

Some resources about the definitions and requirements are listed at <http://extension.psu.edu/plants/green-industry/news/2015/do-you-need-a-pesticide-license>.

*Ms. Swackhamer is with Penn State Extension in Lehigh County. From the **Vegetable, Small Fruit, and Mushroom Production News**, Penn State Extension, [extension.psu.edu/plants/vegetable-fruit/news](http://extension.psu.edu/plants/vegetable-fruit/news), September 9, 2015.*





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GENERAL

# PA Preferred Member: Buckhill Farm



Buckhill Farm, located in Lititz, Lancaster County, Pennsylvania, has been a family-owned farm for more than 60 years. The farm began in the 1940s when the current owner, Andrew Buckwalter's, grandfather purchased the land. The land was a testing ground for New Holland Machineries until they transformed it into a working farm. If you would have asked Buckwalter when he was growing up if he expected to run a farm – his response most likely would have been no. However, after attending college at Muhlenberg College in Allentown, PA, and holding various jobs, he began to gain interest in organic food and farming, which led him to where he is today.

Buckhill Farm became a CSA (Community Supported Agriculture) eight years ago, with only 50 memberships. Today their membership has grown to more than 400 members enjoying the bountiful harvest of Buckhill Farm in their own homes.

"We enjoy being a CSA farm," said Buckwalter. "I love to create a connection with the people I sell produce to."

Buckhill Farm is committed to good stewardship of the land through sustainable agricultural practices. The farm uses organic methods to grow their vegetables, control pests and keep the soil healthy.

"I enjoy educating consumers on local and organic foods," said Buckwalter. "It is important to me to be a part of the 'buy local' movements."

In the future, Buckhill Farm hopes to expand their organic market and create more opportunities to educate their consumers – both on and off the farm. For more information about Buckhill Farm or their CSA program, visit [www.buckhillfarm.net](http://www.buckhillfarm.net).

This advertisement features a large background image of a tractor with the word "CROPCARE" in large white letters across the top. Below this, there are two smaller inset images: one showing a person operating the PR2500 machine in a field, and another showing a close-up of the machine's mechanism. A circular badge on the right side of the ad contains the text "PR2500 Plastic Mulch Lifter/Wrapper".

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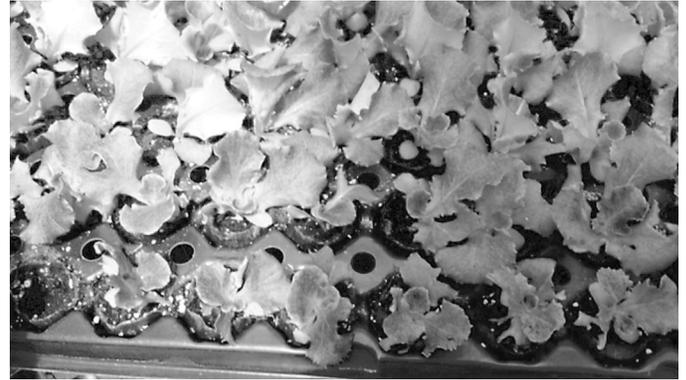
GENERAL

# On the Road: Harvest Valley Farms

Elsa Sanchez and William Lamont

We recently spent an afternoon with Larry King of Harvest Valley Farms in Valencia, Pennsylvania. Larry grows vegetables on 160 acres with his brother Art and nephew Dave.

Various vegetables are grown in nine high tunnels. We saw golden beets, carrots, Swiss chard, curly, dinosaur and red Russian kale, cucumbers, Pennsylvania Simply Sweet onions, spinach and leaf, romaine and butterhead lettuces. One crop you won't see grown in the high tunnels is tomatoes. The Kings have developed a system for growing early tomatoes in the field.



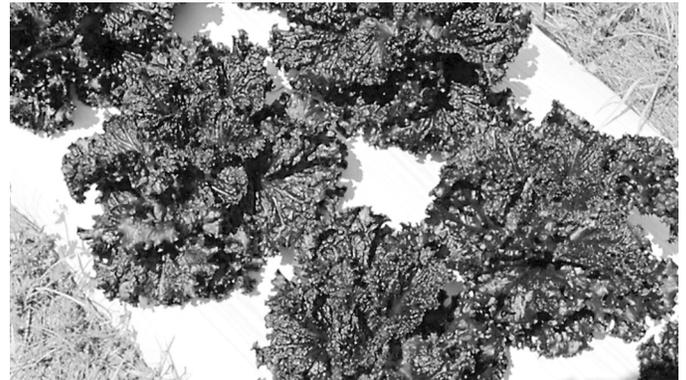
Elle pots are placed in each cell of this flat of lettuce.

A lot of lettuce is grown on the farm. Larry says it is a crop that people never tire of. Transplants are grown in Ellepots. These small degradable paper inserts are placed in each cell of a plastic tray.



Carrots and golden beets growing in one of the high tunnels on the farm.

For early tomatoes, 5-week-old transplants are set in the field in mid-April. Wire hoops are placed in the field to support heavy weight row cover. Once plants push up against the row cover, it is removed. Unless the deer damage the row cover, it can be reused for several years. Plants are then staked and tied using the Florida weave system. This year they are using brand new stakes to help avoid diseases, like early blight. Larry says that they get a 2 week jump on the season using this system. They could get tomatoes another 2 weeks early growing in high tunnels, but the tunnels are better used for more profitable crops.



Rutgers Scarlet Red growing in a plasticulture system with white-on-black plastic mulch.

(continued on page 13)



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## GENERAL

**On the Road...** (continued from page 12)

Larry King standing below garlic drying from the ceiling.

Dave says that their investment in this system has really paid off because the transplants are much easier to remove from the tray. The Ellepots also don't wick water away from the transplants. Transplants are planted in raised beds in a double row with 12 inch in-row spacing. They use a variety of cultivars including Rutgers Scarlet Red, a deep red lettuce high in antioxidants.

Garlic had recently been harvested and we saw it drying from the ceiling of a red barn. They hold 30 pounds to plant the next crop. The rest goes into their various retail markets: a 460 member CSA, 3 farmers markets and their 2 specialty shops.

Vegetables are cleaned, sorted and then stored in one of several coolers. Coolers are kept at 40°F using standard window air conditioners. The key to their cooling system is



Dave King preparing for pick-up of CSA subscriptions.

CoolBot micro-controllers that can be bought on-line. The cost for this system is low and it maintains temperature.

Controlling both large and small wildlife, such as deer, raccoons, possums and ground hogs, is a continuous effort on the farm. One approach they've used is to recently fence in 26 acres, in a more remote location on the farm, with an 8 foot tall deer fence. They use an electric fence around sweet corn, melons and strawberries to deter raccoons. They also hire a professional trapper who had at the time we visited had caught 140 raccoons.

We got to visit their newly built specialty shop. They offer a wide variety of items in the store, including their vegetables, value-added products, including their Harvest Valley Farms

(continued on page 14)

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## GENERAL

**On the Road...** (continued from page 13)

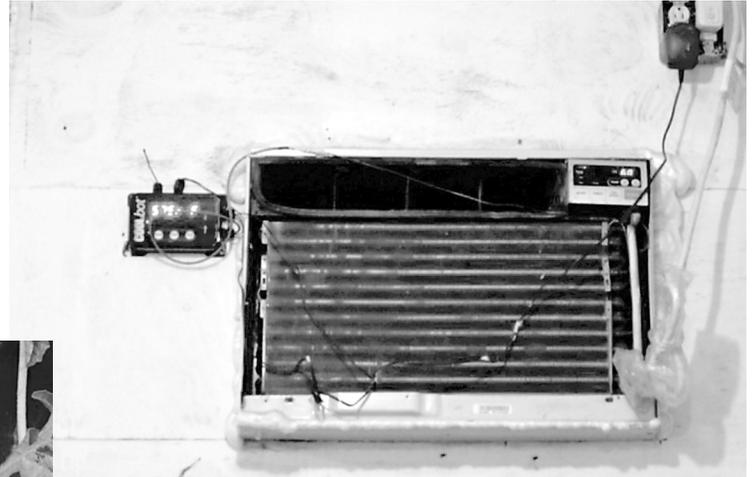
Salsa and a host of other food products made by local vendors. The shop also has a bakery where various types of breads and pastries are made.

Harvest Valley Farms combines high quality produce with excellent marketing skills resulting in a very successful enterprise that supports 3 families.

*Dr. Sanchez and Dr. Lamont are 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/plants/vegetable-fruit/news](http://extension.psu.edu/plants/vegetable-fruit/news), September 10, 2015.*



*Racoon damage to watermelon. Note the paw prints on the plastic mulch.*



*CoolBot micro-controller connected to a window air conditioner.*



*Harvest Valley Farms specialty store in Valencia, Pennsylvania.*

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VEGETABLE PRODUCTION

# Prolonged Dry Weather Slows Disease Progression

Beth Gugino

Across Pennsylvania, the prevailing hot dry weather has slowed the progression of disease in many fields while increasing damage due to spider mites, flea beetle and other insect pests.

In recent days, there have been very few new reports of cucurbit downy mildew. This is likely due in part to the weather as well as the close proximity of many



White circular lesions on pumpkin fruit resulting from bacterial infection (Photo: Beth K. Gugino)

fields to harvest. As we get closer to harvest, managing downy mildew becomes less important however, maintaining a powdery mildew program will be important to protect the handles of pumpkins and gourds used for fall decoration. Similarly, there have been no new reports of late blight either.

In some fields growers are reporting seeing small circular whitish lesions on the pumpkin fruit. Depending on the cultivar, they can be surrounded by dark margin or sometimes a more orangish-yellow to tan margin if the cultivar has a white rind. These could be the result of infections that occurred from either bacterial leaf spot caused by *Xanthomonas cucurbitae* or angular leaf spot caused by *Pseudomonas syringae* pv. *lachry-*

*mans* earlier in the growing season. Both are foliar diseases and the fruit become infected when the bacteria are splash dispersed from the leaves onto the fruit or transferred during via passing equipment or people. The bacteria will colonize the lenticels on the fruit surface and under favorable conditions multiply and lead to the development of visible symptoms. The lesions can expand and exudates can ooze from the lesions and dry on the outside of the fruit. Secondary organisms can also infect and lead to soft rot.

Both pathogens are thought to be seedborne but the impact on disease development is not well understood. Efforts are being made at several universities to better understand the epidemiology of these bacterial diseases and to identify a potential seed treatment protocol since cucurbit seed is too sensitive to hot-water treat. A 2-year minimum crop rotation is recommended to allow the crop residue to thoroughly decompose. Applications of copper tank mixed with mancozeb beginning at fruit set through expansion will help reduce fruit symptoms, however thorough coverage of the leaves and fruit is necessary. Several university research trials have also demonstrated a reduction in fruit symptoms with the application of Actigard, a plant defense inducing product, in addition to copper prior to disease onset.

*Dr. Gugino is with the Department of Plant Pathology and Environmental Microbiology. From the Vegetable, Small Fruit, and Mushroom Production News, Penn State Extension, extension.psu.edu/plants/vegetable-fruit/news, September 2, 2015.*

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## VEGETABLE PRODUCTION

## Cover Crop Mixtures

Gordon Johnson

There is significant interest in cover crop mixtures, and in some cases up to 8 different species are being mixed together. As fall cover crop season is upon us, there are a number of considerations that growers interested in using cover crop mixtures should be aware of.

Cover crop species are commonly grouped into six major categories: 1) cool season grasses; 2) cool season legumes; 3) cool season broadleaves 4) warm season grasses; 4) warm season legumes; and 6) warm season broadleaves. In theory, a successful mixture will combine species from as many categories as practical based on the planting season. For late summer/fall planting we will be limited to 1, 2, and 3 above.

In addition, cover crop species can also be placed into groups based on the benefits they offer or functions they perform. This includes nitrogen fixation, nutrient (particularly nitrogen) uptake and recycling, compaction reduction, disease suppression, biofumigation, weed control, biomass accumulation, use as a mulch, winter killing to facilitate early spring plantings, and erosion control.

The first step in creating a mixture is to list the available species that can be used for the time of the year they will be planted in and the season(s) they will be growing in. For late summer and fall planting this would include small grains (wheat, barley, rye, winter oats, triticale), ryegrasses, rapeseed, other hardy Brassicas and winter annual legumes (crimson clover, hairy vetch, winter hardy field peas, subclover, many other clovers) for overwintering. If winter killed crops with extended fall growing seasons are desired then radishes, mustards, and spring oats would be examples of selections.

The second step would be to list what soil health attributes or other cropping system needs should be prioritized. For example, if a mulch for no-tilling vegetables into next spring is a priority then high biomass cover crops that decompose more slowly such as cereal rye or triticale should be in the mixture. Conversely, if early spring planting is the goal then winter killed cover crops should be in the mixture. If compaction needs to be addressed then radishes or other species in the Brassica family with strong tap roots should be in the mix. If nitrogen fixation is a priority then a high N fixing potential legume such as hairy vetch should be included.

The final step would be to develop seeding rates for each mixture component. This is critical because too much of one component can outcompete other components and limit their survival or limit their usefulness in the mixture. Unfortunately there is little actual science to guide seed rate determinations. Cover crop mixture research has been very limited. With that said, there are some guidelines to follow.

As a general rule, you should reduce the seeding rate from a stand-alone (one cover crop) rate by the percentage that you want to see in the final stand. For example if you want to have at least 50% small grain cover in a mixture with radishes once the radishes winter kill you would reduce your small grain seeding rate by 50% (from 120 lbs to 60 lbs per acre). Radish seeding rates would also be reduced by 25-50%. In a 6 species cover crop mix if you wanted to have equal amounts of all components in the final stand, then start with a seeding rate at 1/6 (17%) of a stand-alone rate.

While this is a good place to start, the rates may need to be modified additionally based on how competitive (or quick growing) each component is. Quick growing species such as rye-

grasses or radishes may need to be reduced relative to slow growing species such as the winter annual legumes to allow the slower growing species to become established. The slow growing species are often maintained 75%-100% of stand-alone rates in mixtures with quick growing species.

Overseeding rates will need to be higher than drilled rates and adjusted to allow for the potential for establishment as an overseeding. Species with lower establishment rates as overseedings will need to have additional seed in the mixture to compensate for lower emergence.

Further modifications both in seeding rate or species selection may be necessary based on residual fertility or planned fall fertility programs. If there is significant residual nitrogen in the soil or if fertilization is planned (to give some components more growth potential) then non-legume species will be favored and rates should be adjusted or legumes should be left out of the mixture.

Another issue is timing for seeding. Some species should be planted 4-6 weeks before a killing frost in September. This would include rapeseed, radishes and other Brassica species as well as winter annual legumes. Small grains can be planted through October. The mixture needs to be planted in the time period that best meets the earliest needs of the species in the mix.

A practical consideration for cover crop mixtures is how they should be best seeded when seed sizes between species are considerably different. Drills with both large seed and small seed boxes are good tools to address this issue. Small seeded species would be mixed and placed in the small seed box and larger seeded species in the large seed box in the appropriate ratios. Alternating rows by blocking off some drill spouts is another option. Spinner spreaders may not work well where there are large differences in seed sizes. Do not forget to inoculate all legumes in the mixture. Seeding rates may need to be adjusted based on the planting equipment available.

Some seed companies offer mixes that have already been blended at certain proportions. While some of these may be suitable for Delaware, growers should look at the specific proportion of each component in the mix to see if it will meet the guidelines listed above. Consideration also should be given to whether or not the mixture can be effectively seeded without seed separation with available equipment.

A successful mixture used in Delaware in the past has been to plant rye and crimson clover with hairy vetch (seeding rates of 30, 10, and 15 lb./A, respectively). An example of a potential September seeded cover crop mixture for Delaware with many winter hardy species is: rapeseed, ryegrass, cereal rye, crimson clover, and hairy vetch. A multi-species example with combinations of winter killed and winter hardy species is: radish, mustard, spring oats, triticale, crimson clover, and field peas.

Growers will need to do some experimentation on their own farms with different mixtures and seeding rates to determine what works best for their farm, growing conditions, planting windows and rotations.

*Dr. Johnson is the Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware Extension, Vol. 23, Issue 25, September 11, 2015.*

# Cucurbit Viruses and Transmission

Nicholas J. Brazee

Within the last couple of weeks, several cucurbit viruses have shown up across the state on a variety of crops—diagnosis of submitted samples is ongoing. Cucurbits are susceptible to more than 32 viruses, which can cause a wide variety of symptoms, including color breaking or mottling of fruit, mosaic or mottled patterns on leaves, and darkening, distortion, and/or blistering of leaf tissue. Most cucurbit viruses are part of the *Potyvirus* family (which includes potato virus y, though this virus does not affect cucurbits), and are vectored by aphids. Species of aphids that prefer potatoes are moving on to alternate host crops such as cucurbits now that potato vines are being mowed or desiccated.

**Transmission** - Viruses have been classified as non-persistent, semi-persistent, and persistent, depending on the length of time the insect vector can retain infectious virus particles, which can range from minutes to hours (non-persistent) to days (semi-persistent) and to life-time and even inheritance by the insect progeny (persistent). Most of the viruses we encounter in cucurbit fields in the Northeast are non-persistently transmitted by aphids, except for Squash Mosaic Virus which is transmitted semi-persistently by cucumber beetles. Many species of aphid transmit viruses non-persistently, meaning that they acquire and spread virus particles quickly. Aphids probe plants as they move along to determine if they are preferred hosts or not—even this quick probing activity can be enough for an aphid, which may not even be a pest of a given crop, to spread the virus. Aphids can pick up the virus particles anywhere along their path and are very efficient at spreading

them, often causing 100% of the crop to be affected. Because of this probing behavior, aphids should not be controlled using insecticides, which cause increased muscle twitching and more probing (insecticidal soaps and horticultural oils do not have this effect). Once the virus is present it is there to stay, though fruit may not be affected if the virus was acquired after pollination occurred. Mechanical transmission of viruses from plant to plant may also occur via movement of plant sap by equipment or workers (e.g., in pruning or harvesting). Some viruses can be seed-borne and other may overwinter on weed hosts.

**Prevention** - Once a virus becomes visible in your crop there is no cure or chemical treatment, so prevention is essential. Furthermore, the severity of disease caused by viruses is usually determined by the timing of infection—the earlier infection occurs, the greater the impact on plant growth, fruit symptoms, and fruit set. Delaying the onset of infection by several weeks can have a dramatic effect on the amount of damage.

**Cultural Practices** - Start with certified virus-free seed, some viruses can be seed-borne in particular crop species.

Where possible, do not grow ornamental plants and vegetable transplants in the same greenhouse, as viruses often have large host ranges including vegetables, ornamentals, and woody plants and may be introduced on infected plugs.

**Plant resistant cultivars.** Many resistant varieties are available in a variety of crops including cucumber, summer squash and melons. Resistance is derived from traditional breeding as well as through genetic engineering, while some species are naturally resistant to certain viruses.

*(continued on page 22)*

## HEALTHY PREDATORS, PARASITES ON PATROL

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## VEGETABLE PRODUCTION

## Fall Weed Management Advice

Richard Bonanno

Weed management is still important at the end of the season. There are three main activities that need to be completed. They are: fall field scouting, preventing weed seed production, and controlling perennial weeds.

### End of Year Weed Scouting

It is worthwhile to take the time to check fields for weed problems at this time of year. A quick scouting can identify problems that will be expensive to solve if they get out of control and can provide clues that will help in designing a weed management program for next year. Mapping weedy spots, and keeping some kind of permanent record of weed surveys, can help you evaluate your weed management over the years. Make a map of each field and fill in the following information:

**How Many?** How dense are the weeds? If weeds are very dense, they may be having an impact on yields. This is especially true if these weeds emerged early in the season, when competition is greatest. If weeds were actively growing during the period of greatest crop growth, consider changing the weed management program.

**Which Weeds?** Identifying weeds can help identify potential problems before they get out of hand, and can help you decide if you need to modify your weed control program. Weeds like yellow nutsedge, field bindweed, and quackgrass are spreading perennials, which have underground parts that enable them to spread throughout whole fields. Because these weeds can be very damaging, and are very difficult to control, they are worth "nipping in the bud". In addition, keep an eye out for annual weeds that are new to a field or are increasing in numbers. Some weeds can be very difficult to control in some or all of the crops in your rotation. Galinsoga, for example, is hard to control in cole crops, peppers, and squash. Nightshades are difficult to control in tomatoes for growers who rely on herbicides for control, because they are in the same family as tomatoes. Velvetleaf is hard to control in sweet corn.

**What worked?** It is also useful to look at the whole field and evaluate the effectiveness of your weed control efforts. If some weeds are generally escaping, identify them. They may point to weaknesses in your herbicide or cultivation program. If mostly grasses, or mostly broadleaves are escaping, it may require an adjustment of either the rates or the timing of grass or broadleaf herbicides. You may also find the New England Vegetable Management Guide useful. This manual contains a chart listing the effectiveness of vegetable herbicides on most of the common weeds in New England. Use this guide to find an herbicide labeled for your crop that might give better control than the one which was used.

**Where are the weeds?** Weeds in the rows or planting holes are much more damaging to crop yields than between-row weeds. Weeds in rows may be an indication that cultivation equipment needs adjustment, or cultivation needs to be done earlier.

### Preventing Weed Seed Production

Annual weeds produce incredible amounts of seeds. Annual grasses normally produce 3,000 to 5,000 seeds per plant, small seeded annual weeds such as pigweed and lamb-quarters can produce 100,000 to 250,000 seeds per plant, and larger seeded broadleaf weeds such as velvetleaf and smartweed can produce 5,000 or more seeds per plant.

Perennial weeds can also produce seeds or other reproductive structures. For example, one yellow nutsedge plant can produce 2000 tubers. Perennial weed management is covered below. Once fields are harvested, they should be tilled or disked as soon as possible to prevent seeds from maturing. Be especially concerned with weeds that are new to a field or are in abundant supply. If time is short, one alternative is to mow the weeds. This will remove the primary seed stalk but will also encourage lateral branching. Eventually, however, these branches will produce seeds and must be destroyed. For some weeds, like Galinsoga, seed maturation may continue after mowing or pulling—these plants should be removed from the field if possible.

### Perennial Weed Management

The best time to control perennial weeds is in the Fall. All perennial weeds have storage structures (tap roots or rhizomes) below ground that enable these plants to survive the winter and regenerate themselves the following year. Fall tillage of perennial weeds will kill top growth and fragment the storage organs but will not kill the weed. Frequent tillage will, over a long period of time, control perennial weeds but, in most cases, this is not practical.

*(continued on page 19)*

## Fall Control of Perennial Weeds

Mark VanGessel

Fall is often the best time and the most convenient time to treat most perennial weeds because it is the time that plants are best able to move the herbicide to the roots where it will do the most good. When considering fall weed control the emphasis should be on what the patch of weeds will look like next spring or summer not the amount of dead stems this fall. Also, it is important to consider that a fall application will not eradicate a stand of perennial weeds; the fall application will reduce the stand size or the stand vigor.

Fall application of glyphosate is the most flexible treatment for most perennial weeds such as bermudagrass, Canada thistle, common milkweed, common pokeweed, dock, hemp dogbane, horsenettle and johnsongrass. Rates of 1 to 1.25 lb acid per acre are consistently the most economical (or about 1.5X the normal use rate for annual weeds). Dicamba (Banvel) at 2 to 4 pints is also labeled for artichoke, bindweeds, dock, hemp dogbane, horsenettle, milkweeds, pokeweed or Canada thistle. Planting small grains must be delayed after dicamba application 20 days per pint of dicamba applied. Fall herbicide applications should be made to actively growing plants. It is best to allow plants to recover after harvest and to spray prior to mowing the corn stalks. Allow 10 to 14 days after treatment before disturbing the treated plants. If fall applications are delayed, remember weed species differ in their sensitivity to frost; some are easily killed by frost (i.e. horsenettle) others can withstand relatively heavy frosts. Check the weeds prior to application to be sure they are actively growing.

*Dr. VanGessel is the Extension Weed Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware Extension, Vol. 23, Issue 24, September 4, 2015.*

## Gold Flecking on Tomatoes

Jerry Brust

"Why do I still have gold fleck on my tomatoes when I have sprayed repeatedly for thrips? I must have a resistant thrips population." I have heard growers tell me this a few times this year. When I ask why they think they have a thrips problem since they usually tell me they do not see any thrips it is because of the gold flecking (Figure 1) they see on their tomatoes at harvest. While gold fleck on tomatoes can be caused by a moderately high thrips population, at this time of year the explanation of the cause of flecking is more likely due to the weather conditions we have been having. I have conducted research and read many other studies on gold flecking over

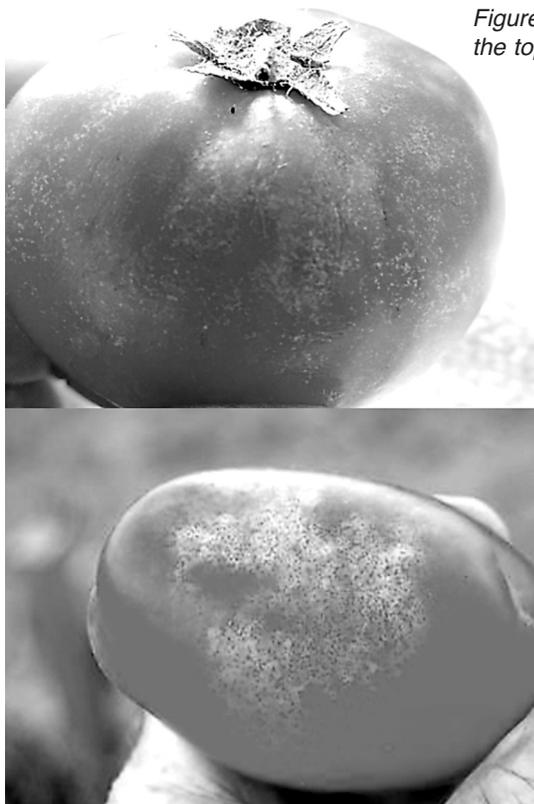


Figure 1. Gold flecking on a red round and a plum tomatoing on the top and mite or thrips feeding on the bottom

the last 5 years and they all point to 3 main possible causes. The most likely and common one is when we have high daytime (>88°F) and nighttime (>68°F) temperatures combined with high humidity (dew point temperatures >68°F) and that is what we are experiencing now and have been from July through August. The second most common cause is high populations of either two spotted spider mites (more common) or thrips (less common) feeding on the plant. You can tell that high populations are present when the mites or thrips feeding on the leaves cause white speckles (stippling) on the leaves of a plant (Figures 2 and 3). Sometimes the damage becomes so bad that the edge of a leaf will turn brown and die because of the feeding (Figure 4).

Gold flecking is not from direct mite or thrips feeding on the fruit itself—it can't be because gold flecking can be induced in tomatoes with no thrips or mites being present with high temperatures and humidity. Mites and thrips CAN feed directly on tomato fruit and this damage can superficially look like gold flecking. But the actual 'fleck' in gold flecking is caused by calcium salt crystals that form inside a cell. Mites or thrips damage the fruit to get at the juices and leave damaged cells behind (Figure 4). If you rub you finger or thumb lightly

(continued on page 20)

### Fall Weed... (continued from page 18)

Perhaps the best control technique for perennial weeds is an application of glyphosate (Roundup) before the plant goes dormant. Perennial broadleaf weeds such as bindweed or dandelion should be sprayed while they are still actively growing which is usually before a hard frost. Perennial grasses, such as quackgrass, can be sprayed as late as mid-November. Use 10 to 20 gallons of water per acre when spraying Roundup. Two quarts of the herbicide will provide much better control at 10 gallons of water per acre than at 40 gallons of water per acre. Spraying on a mild afternoon following a cold or cool morning is best to encourage translocation of the herbicide to the below-ground storage structures. Disking or tilling two weeks after application will also improve control of the weeds.

Many growers fight perennial weeds such as quackgrass in corn fields year after year because their primary goal in the fall is to plant a cover crop. This is usually followed by a spring application of Roundup which provides top kill but does not kill the whole weed. Applying Roundup at the proper time is the only way to achieve good control. Delaying the seeding of a cover crop may be a necessary evil in the fight against perennial weeds.

In conclusion, remember to scout and map your fields, prevent weed seed production, and apply Roundup at the right time to control perennial weeds.

Dr. Bonanno is the Univ. of Massachusetts Extension Weed Specialist. From *Vegetable Notes for Vegetable Farmers in Massachusetts*, Univ. of Massachusetts Extension, Vol. 27, No. 20, Sept. 3, 2015.

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## VEGETABLE PRODUCTION

**Gold Flecking...** (continued from page 19)

over gold flecked fruit it will feel smooth, but rub it over thrips or mite damaged fruit and it feels rough. At times, if mite populations are high you could get both gold flecking and direct mite feeding on a single fruit. The third possibility that is pretty rare for field production tomatoes is excessive levels of calcium and phosphorous, but these levels have to be extremely high and rarely if ever occur under field conditions. They do occur, though, at times in hydroponic production systems where gold flecking is considered more of a nutrient imbalance. This is just a quick summary of the work that has been done on this very difficult-to-pin-down problem.

So if you have been spraying for thrips because of gold flecking and you are still seeing it, STOP SPRAYING and check for: 1. thrips, and 2. two-spotted spider mites. You might find a few of each of these, especially the mites as they like hot dry weather, exactly what we have been having. Also look at the foliage to see if there is white speckling over most of the middle and top half of the plant. If it is mites Oberon or Portal (both have a 1-day PHI) or Acramite (with a 3-day PHI) can be used. But chances are you have only low levels of either of these two pests and it is more likely because of our weather conditions that you continue to see gold flecking on your tomatoes.

*Dr. Brust is the IPM Vegetable Specialist at the Univ. of Maryland. From the **Weekly Crop Update**, Univ. of Delaware Extension, Vol. 23, Issue 24, September 4, 2015.*

*(continued on page 21)*



Figure 2. Moderate white flecking on leaves caused by two spotted spider mite feeding.



Figure 3. Heavy feeding damage on tomato leaves caused by two spotted spider mite feeding

Figure 4. Very heavy TSSM feeding on tomato leaf.



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VEGETABLE PRODUCTION

**Gold Flecking...** (continued from page 20)

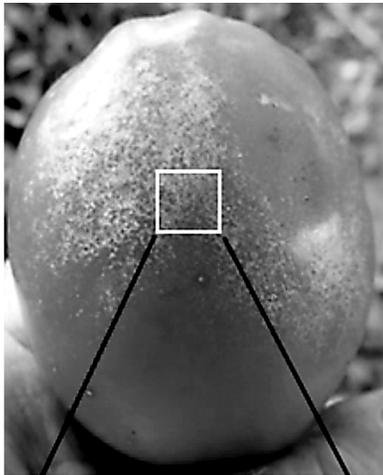
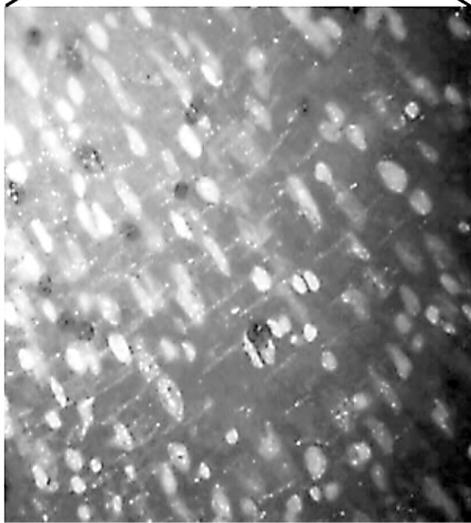
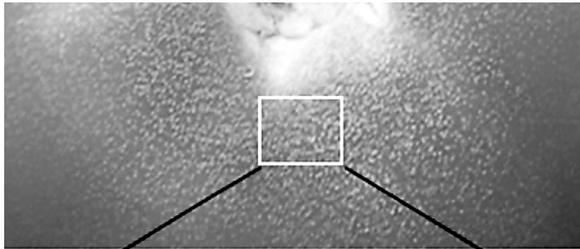
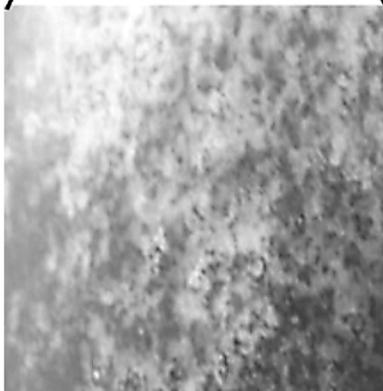


Figure 5. Comparison of gold flecking on the top and mite or thrips feeding on the bottom.



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## VEGETABLE PRODUCTION

**Cucurbit Viruses...** (continued from page 17)

Cucumber mosaic virus (CMV) on squash leaves



Papaya ringspot virus (PRSV) on squash leaf and fruit



Watermelon mosaic virus (WMV) on a squash leaf



Zucchini yellow mosaic virus (CMV) on a squash leaf

Cover the crop with floating row covers in the spring to prevent the early influx of virus-carrying aphids. Be careful with this tactic, as aphid populations can develop quickly under row cover if present when the crop is covered, and row covers will exclude beneficial insects that might otherwise help control aphid populations. Make sure plants are not already infested before you apply row covers.

Reflective mulches can repel aphids. Though slightly more expensive, they may be cost-effective if viruses are a chronic problem.

Eliminate weed host reservoirs such as shepherds purse, dandelion, field bindweed, purple dead nettle, and Canadian goldenrod.

*Prunus* species (peaches, cherries, etc.) are attractive to green peach aphids. Removing wild cherry trees from around fields can make the area less attractive to green peach aphids. The green peach aphid is not the only aphid that transmits viruses, but it is important because it is a universal vector.

Handle plants as little as possible, clean tools frequently, and work in clean fields first and affected fields last to minimize mechanical transmission by workers and equipment.

Remove and destroy affected plants to prevent a source of virus for further infections.

**Insecticides** - Because most cucurbit viruses are transmitted non-persistently (rapidly), insecticides DO NOT act quickly enough to prevent infection or control disease spread. Systemic materials are generally the most effective insecticides available for aphid control because they are taken into the plant tissue and ingested by aphids when feeding. However, when probing a leaf an aphid is not feeding and does not ingest plant sap or insecticide. In fact, the presence of an insecticide may actually stimulate aphids to probe more quickly, and to move from plant

to plant rapidly, in an effort to find a suitable feeding site. This can increase the spread of non-persistently transmitted viruses in cucurbit crops. Mineral oil sprays have been used to deter aphids from feeding, but this method can be costly and unreliable. Conversely, controlling spotted and striped cucumber beetles can effectively reduce the spread of Squash Mosaic Virus through a field because those insects transmit SqMV semi-persistently, feeding for 5 minutes before the virus is acquired and retaining the virus for many days (up to 20).

**Important Viruses.** Listed below are the six viruses you are most likely to encounter in New England cucurbit fields. Of these, CMV and WMV occur every year and PRSV occurs most years in the Northeast. SMV would mostly be introduced via contaminated seed and ZYMV has not

been seen in the Northeast for many years.

**Cucumber Mosaic Virus (CMV)** - causes severe plant stunting, prominent foliar mosaic, malformation, downward cupping and reduced size of leaves. Flowers may be malformed or have greenish petals. Fruits may be distorted, discolored, and small and may not produce many seeds. Summer squash, some melons, and some pumpkins are most severely affected, while cucumbers, watermelons, and winter squashes are less severely affected. The host range of CMV includes at least 1200 plant species including many vegetables, ornamentals, and woody tree species. CMV is non-persistently transmitted by over 60 species of aphid, including green peach, potato, and foxglove aphids. CMV may be seed-borne in some cucurbit crops and weeds including chickweed (*Stellaria media*). Most varieties of cucumber are bred to have good CMV-resistance. Some summer squash varieties carry a "precocious yellow gene" which masks the color-breaking effect caused by CMV infection, some have intermediate resistance, and others carry high transgenic resistance to CMV. Melons may carry intermediate resistance to CMV, though no commercial musk-melon varieties are resistant. Most watermelon varieties are naturally resistant to the most prevalent strains of CMV.

**Papaya Ringspot Virus Type W (PRSV-W)**: causes prominent foliar symptoms including a green mosaic, malformation, puckering, distortion and narrowing of leaves. Affected fruit is malformed, knobby, and exhibits color-breaking. PRSV-W is non-persistently vectored by over 20 species of aphid, including cowpea, melon, foxglove, potato, and green peach aphids. PRSV-W is not seed-borne. PRSV-W can be effectively prevented by host resistance in cucumber, melon, winter and summer squash, but no watermelon varieties are resistant.

(continued on page 23)

## VEGETABLE PRODUCTION

## CLASSIFIEDS

**Cucurbit Viruses...** (continued from page 22)

**Squash Mosaic Virus (SqMV):** affects squash and melons and some species in the family *Chenopodiaceae*. Foliar symptoms include green vein-banding, mottling, a dark green mosaic, blistering and hardening of leaves, ringspots, and protruding of veins at margins. Infected fruits are mottled and infected melons lack netting. SqMV can be transmitted by seed, and this is the primary source of inoculum for outbreaks. Once introduced SqMV is transmitted by spotted and striped cucumber beetles. Beetles acquire the virus after feeding on an infected plant for 5 minutes and can retain the virus for 4-20 days—in the case of SqMV, controlling insect populations will help reduce spread of disease.

**Watermelon Mosaic Virus (WMV):** causes green mosaic, rough wrinkled leaves, darkening of leaf veins, chlorotic rings and malformation. While foliar symptoms can be severe, especially in winter and summer squash, fruit is generally not affected. Yellow colored summer squash fruit may develop green spots. The host range of WMV includes most of the *Cucurbitaceae* and the virus overwinters primarily in wild legumes (*Trifolium spp.*, e.g., clovers), as well as members of the *Chenopodiaceae* and *Malvaceae* families. WMV is non-persistently vectored by over 20 species of aphid, including foxglove aphid, potato aphid, and cowpea aphid. WMV is not seed-borne in cucurbits or legumes. Resistant varieties of cucumber are available.

**Zucchini Yellow Mosaic Virus (ZYMV):** causes a yellow leaf mosaic, severe malformation and blistering, reduced leaf size and plant stunting. Squash and pumpkin fruit are reduced in size and greatly deformed and knobby. Muskmelon and watermelon fruit are also reduced in size and deformed, causing deep cracks. Of the cucurbits, pumpkin, summer squash, muskmelon and watermelon are especially affected. ZYMV is also non-persistently transmitted by aphids, including melon and green peach aphids. New varieties of squash, melon, and cucumber have been developed with high, transgenic resistance.

**Tobacco Ring Spot Virus (TRSV):** is rare in MA but has been observed in PA. Initial symptoms on cucurbits are pinpoint necrotic spots with bright yellow haloes that develop into a bright yellow mosaic on young leaves. The initial onset of symptoms is followed by a slow recovery. Older leaves are dark green but reduced in size and plants are not very productive. Fruits of infected watermelon plants may develop elevated pimples and ringspots. This disease is primarily vectored by dagger nematodes, but can be mechanically transmitted by equipment or workers, and can be seed-borne.

*Dr Braze is the Univ. of Massachusetts Extension Plant Pathologist. From Vegetable Notes for Vegetable Farmers in Massachusetts, Univ. of Massachusetts Extension, Vol. 27, No. 20, Sept. 3, 2015.*

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