PENNSYLVANIA
VEGETABLE GROWERS

NEWS

October 2018 / Volume 41 Number 10

for the commercial vegetable, potato and berry grower

Report This Summer's Losses to FSA Offices

The extremely wet weather this summer has resulted in significant losses for many growers across the state due to actual flooding or just extended wet conditions that prevented timely pesticide sprays resulting in pest or disease issues or that interfered with harvesting. PVGA is urging growers to report losses they have experienced to their local FSA office so they can compile loss reports. This will enable them to determine if local areas would be eligible for a USDA disaster designation. If counties are designated as USDA disaster areas, growers in these counties and adjacent counties would be eligible for FSA low-interest emergency loans. Current FSA borrowers in these counties would also be eligible to have their eligible debt payments set aside.

One of the criteria for determining whether a county is eligible for disaster status is whether there is a 30% production loss of at least one crop across the county. So it is very helpful if all growers would report their losses to their local FSA offices even if your individual losses are less than 30% because it helps FSA develop a more accurate assessment of the losses across the whole county. Even if you personally don't expect to collect any benefits from FSA, allowing FSA to develop an accurate assessment of the losses and thus designating a county as a disaster area will potentially allow growers who did experience greater losses to be eligible for benefits. Application for disaster designation must be made within 90 days of the event triggering the damage, so please report to your local FSA office as soon as possible.

PVGA Planning H-2A Workshop December 5

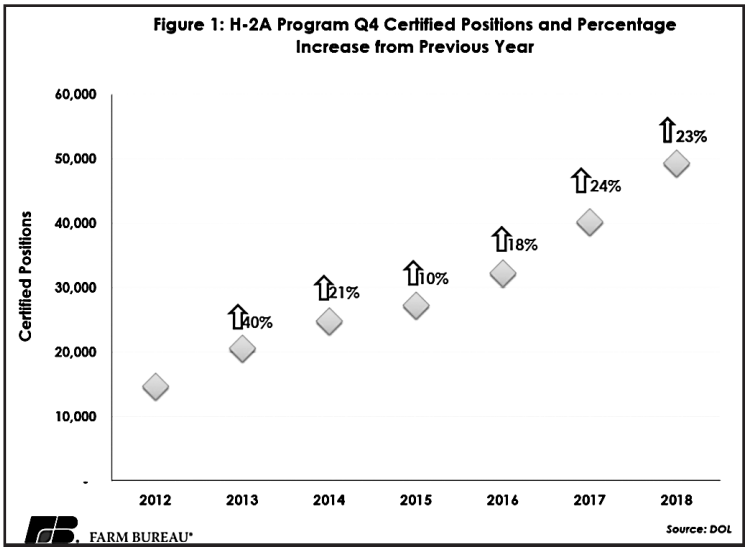
While Congress has considered revising the H-2A Agricultural Labor program and other immigration reforms, most observers do not expect Congress to pass any reform measures this year. That means that if you rely on immigrant labor, you might want to consider using H-2A workers. The H-2A program requires growers to apply for the number of workers they need to the Department of Labor and show that they have tried to hire American workers. Employers must provide housing plus transportation to and from the workers home country as well as guarantee a certain number of days and hours of work and pay workers at least the Adverse Effect Wage Rate (which is currently $12.05 for Pennsylvania). However one benefit of using H-2A labor is that the employer can be certain his workers are legally allowed to work here in the United States. Many growers have reported very positive experiences with H-2A despite the costs and red tape involved in the process. PVGA is planning to offer a day-long seminar to familiarize growers with the H-2A process on December 5 in Harrisburg. This will be an in-depth workshop on the requirements of employing H-2A workers and working through the application steps. If you have not already contacted PVGA regarding your interest in this program, please call us at 717-694-3596 or email us at pvga@pvga.org so we can send you details on the seminar.

The following article from the American Farm Bureau contains some statistics about the increasing use of H-2A workers by American farmers.

Eye-Popping H-2A Figures Posted in FY2018

Veronica Nigh

In July 2018, after the third quarter H-2A program data was released by the U.S. Department of Labor's Office of Foreign Labor Certification, we predicted an extremely large number of positions would be certified in the fourth quarter, pushing DOL certifications over the 240,000 mark in fiscal year 2018. With DOL certifying more than 49,000 positions in July, August and September – an increase of over 23 percent from fourth quarter 2017—that projection has been proven correct. A strong fourth quarter brought the total number of certified positions in FY 2018 to 242,762 – an increase of more than 21 percent over FY 2017.



The end of the fiscal year presents a good opportunity to compare growth in H-2A use among different states and crops. In FY 2018, Georgia had the largest number of certified posi-

(continued on page 8)

NEWS

In Memory

Dorothy Oswald

PVGA member, Dorothy Oswald of Bala Cynwyd, passed away on August 15, 2018. She and her husband, James Oswald, founded the Institute for Plant Based Nutrition with the following mission:

To provide education in terms of plant-based nutrition for all the people of the world.
To participate and strengthen the existing organizational network of plant-based nutrition education.
To create new literature and establish plant-based nutrition vocabulary.
To utilize current technologies to empower people with knowledge as to the benefits of plant-based nutrition.

In addition to her husband, Dorothy is survived by her children Richard, Ramona, and Roberta plus grandchildren.

Needed: Nominations for PVGA Directors

The terms of seven members of the PVGA Board of Directors expire at the Annual Meeting scheduled for Wednesday, January 30, 2019, at the Mid-Atlantic Fruit and Vegetable Convention in Hershey. The Directors whose terms expire are:

Barron Hetherington – Ringtown – first elected 2019
Alan Kemmerer – Berwick – first elected 2017
David King – Bakerstown – first elected 2013
Robert Shenot – Wexford – first elected 2007
William Reynolds – Waynesboro – first elected 2007
Jonathan Strite – Harrisburg – first elected 2010
Timothy Weiser – York Springs – first elected 2007

All would be eligible for re-election under the 18-year term limits set by the Board. Under changes adopted at last year's Annual Meeting, the members will elect five members to the Board and the Board will name a sixth Director. Only six of the seven seats will be filled to return the Board to a total of 18 members over the next three years. The Board currently has 21 members due to allowing the Board to appoint additional Board members to provide diversity and potentially certain expertise in the Board makeup that the election process does not always provide.

Like last year, the election will be conducted by a mail-in ballot that will be mailed to all members with the dues renewal notices in late November/early December. The Leadership and Recognition Committee will be seeking additional nominees to be included on the ballot. Members who want to nominate someone for Director, or who would like to be considered, should contact the PVGA office at 717-694-3596 or pvga@pvga.org or David Miller, who as Past President serves as chair of the Committee at dave@millerplantfarm.com.

PVGA Young Grower Award Applications Being Accepted

The "PVGA Young Grower" award was a new award established two year's ago. Brandon Christner was the first recipient at the 2017 Mid-Atlantic Convention and Peter Salerno III was the recipient at the 2018 Convention. The winner is chosen each year by the PVGA Leadership and Recognition Committee. PVGA members are asked to nominate a young grower (someone they know or themselves) who meets the criteria for the Award. The criteria are as follows:

- is a PVGA Member who is 35 years old or younger;
- has been successfully growing vegetables, potatoes or berries for less than five years; and
- has contributed to advancing or promoting the Pennsylvania vegetable, potato or berry industry.

The prize for the winner will be free registration and lodging for the 2019 Mid-Atlantic Fruit and Vegetable Convention. To nominate someone or yourself, send a brief but comprehensive description of the farm operation and the nominee's qualifications to PVGA at pvga@pvga.org or 815 Middle Road, Richfield, PA 17086, by November 30, 2018.

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

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

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

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

NEWS

2018 PVGA Membership at 1,016

In 2017, PVGA membership reached its highest level in recent history at 1,063 members. Unfortunately, in 2018, membership dropped to 1,016, a significant drop but still above the long-held goal of having 1,000 members, first reached in 2011. While membership increases in recent years are steps in the right direction, the Census of Agriculture indicates there are over 3,300 farms in Pennsylvania that grow an acre or more of vegetables. Thus, PVGA has a large potential membership as yet untapped.

The Directors have set a goal of retaining 90% of the previous year's members and recruiting 15% new members each year. Unfortunately for 2018 only 81% of last year's members rejoined although the goal of recruiting 15% new members was met – that is they were not members in 2017. Membership has increased over the previous year in six of the last ten years, increasing 12% in that time period from 907 in 2009.

PVGA is completing its 92nd year as an association. The Directors are fully aware that membership goals can only be met and maintained by providing an adequate return to members for their dues investment.

As a result of the Vegetable Industry Strategic Planning Initiative which the Association and the Pennsylvania Vegetable Marketing and Research Program (PVMRP) undertook in early 2014, the Association appointed a Capacity Development Committee to explore how the Association can develop the resources in terms of funding and staffing to provide more services to growers/members.

Meanwhile, however, the Association strove to continue to provide a good return on members' dues investment in 2018 with the following ongoing activities and member services:

- PVGA helped sponsor the 2018 Mid-Atlantic Fruit and Vegetable Convention – the premier grower meeting of its kind on the east coast.
- PVGA published the *Pennsylvania Vegetable Growers News*, its own 24-plus-page monthly newsletter with pertinent information for the Pennsylvania vegetable, potato, berry or greenhouse vegetable grower.
- PVGA produced a weekly/biweekly *PVGA Update* email for members with email capability to keep members regularly updated about the Association as well as pertinent articles of interest on the internet.
- PVGA provided $67,156 for vegetable and small fruit research in 2018 - bringing the Association's total for research contributions to $1,086,228 over the last 30 years.
- PVGA represents the interests of the vegetable, potato and small fruit industries on legislative and regulatory issues through letters and meetings with public officials.
- PVGA cooperated with the Department of Agriculture and the Vegetable Marketing and Research Program to represent the Pennsylvania vegetable industry at various promotion events.
- PVGA co-sponsored several regional twilight meetings and field days this summer and fall as grower educational opportunities plus a bus tour of New Jersey farm markets.
- PVGA holds the trademark for the Pennsylvania Simply Sweet Onion to help develop a new profitable, branded crop for Pennsylvania growers.
- PVGA is especially proud of the volunteer effort put forth each year by PVGA members to run the Association's Food Booths at the Farm Show and Ag Progress Days. As noted above, these efforts have enabled PVGA to donate over $1,000,000 dollars towards research and promotion activities over the last 30 years. The Board of Directors has essentially devoted the profits from the Food Booths to fund the Association's research, promotion and donation budgets rather than any of the Association's general operations.

In 2018 PVGA members again received free subscriptions to the *American Vegetable Grower* magazine and the *Vegetable Growers News.*

Dues invoices for 2019 will be mailed in late November or early December. We hope all members will renew your memberships for 2019 and that you will urge a neighboring grower to join as well. We want to see PVGA membership continue to increase. Increased membership allows the Association to better the serve the vegetable, potato and berry growers of Pennsylvania – and that is our end purpose.

We Need Your Help at the Farm Show!

Each year over 200 PVGA members and friends volunteer at the PVGA Food Booth at the Pennsylvania Farm Show in Harrisburg. We need at least 25 volunteers in the booth at all the times. Since the Farm Show runs from 8:00 a.m. to 9:00 p.m., we need two shifts to completely cover each day from January 5 to 12, 2018. That translates into a lot of volunteer hours. Plus, this year we will again be open the afternoon of Friday, January 4, from noon to 9:00 p.m.

You say you don't come to the Farm Show? Why not break tradition and come for once? It's worth the trip just to volunteer your time to the Association and any farmer is bound to see at least a few things of interest at the Farm Show. There is a wide array of exhibits throughout the Complex. Are you really too busy in the middle of the winter to take a day off to help support vegetable and small fruit research? Last year we earned about $165 for each volunteer shift enabling the Association to give over $66 per member to Penn State research.

We are grateful to the many PVGA members who help out each year but we need new volunteers each year. If YOU have never helped before, PLEASE call us today at 717-694-3596 and volunteer for 2019. You'll be helping your Association besides having an enjoyable time.

Be a Keystone Member for 2019 and Invest in PVGA's Future

In 1994, the Association established a new membership class, the Keystone membership, and an endowment-type fund, the Keystone Fund. PVGA members who wish to support the vegetable, potato and berry industries in a special way pay dues above the regular rate, with the dues above the regular rate being placed in the Keystone Fund. The current balance in the Keystone Fund is about $154,000 which is invested in money market accounts, two bond mutual funds and stocks under an investment advisor.

(continued on page 6)

NEWS

National News Brief

Farm Bill Expires Without Replacement

Congress failed to pass a new farm bill or an extension by its Sept. 30 deadline, resulting in the 2014 Farm Bill expiring without a replacement for the critical agriculture legislation in place.

As of early October, House and Senate leaders continued to work out differences between the versions of the farm bill each chamber passed this summer. Once leaders reach agreement on a final version, it will need to be voted upon by each chamber.

Farm organizations had urged Congress to pass a new farm bill by the deadline, noting that farmers are already contending with volatile markets and prices as a result foreign trade disputes as well as a depressed farm economy.

American Farm Bureau President Zippy Duvall said the certainty provided by the farm bill is critical as farmers are already dealing with many unknowns.

"Farmers are in limbo—not knowing if the risk management programs they need to qualify for operating loans will be there," Duvall said. "The sky won't fall right away. The residual effects of programs that have been in place until now will keep working for a little while. But time will run out. And the longer it takes to get the new farm bill passed, the greater the harm to confidence in our farm economy."

With the 2014 Farm Bill expiring, funding for many major programs—including crop insurance, nutrition assistance and the Dairy Margin Protection Program—will continue through December before running out.

But funding for nearly 40 other programs will be cut off. Those include several research programs, assistance for beginning farmers, certain energy and conservation programs, value-added grants, foreign market development, farmers market promotion, and more.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2018.*

Financial and Technical Assistance Available from the NRCS for Multiple Conservation Projects

Financial and technical assistance is available from USDA's Natural Resources Conservation Service to help agricultural producers implement conservation practices that improve water quality, produce healthy soils and improve grazing lands. Other projects that qualify for assistance include energy conservation, installing high tunnels to extend the growing season and implementing conservation practices on certified organic farms.

Plans submitted to NRCS before Oct. 19 will be considered for the current round of assistance but another round of funding will be available in coming months. Details of the program are available from local field offices or available on the USDA website: http://offices.sc.egov.usda.gov.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2018.*

Relief Funds Established for Farmers Affected by Hurricane Florence

North Carolina Farm Bureau and South Carolina Farm Bureau have established relief funds to help farmers recover from Hurricane Florence, which slammed the states with devastating floods in September.

The full extent of the storm damage is not yet known but officials expect widespread damage to farms and a long recovery time.

To contribute to the North Carolina fund, visit www.ncfb.org/Florence-Relief-Fund or mail a check addressed to North Carolina Farm Bureau Foundation, Inc. and designated for "Florence Relief Fund" to: North Carolina Farm Bureau Foundation, Inc.; Florence Relief Fund; Attn: Perry Crutchfield; PO Box 27766; Raleigh, NC 27611-7766. For questions, call 919.782.1705.

To contribute to the South Carolina fund, send a check made out to "SCFB Agricultural Aid Foundation" to South Carolina Farm Bureau; Attn: Ron Quesinberry; PO Box 754; Columbia, SC 29202.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2018.*

Northeast SARE Farmer Grant Applications Due Nov. 27

Richard Lamoy of Hid-In-Pines Vineyard, Morrisonville, NY evaluated the propagation and transplanting of grape vines to reduce labor and costs. He rooted and grew cuttings in plug trays, saving as much as $4 per vine (compared to purchasing bare root vines). He planted vines using a common water wheel transplanter, saving as much as $801 per 1000 vines in labor costs (compared to planting bare roots). Richard developed a step-by-step guide on this process to share lessons learned with other growers. His trials and outreach were funded with a Northeast SARE Farmer Grant.

Applications for the 2019 Northeast SARE Farmer grants program are due online by Tuesday, November 27, 2018, at 11:59 p.m. ET. Farmer grants are for farm business owners and managers who have innovative ideas they want to test using a field trial, on-farm demonstration, marketing initiative, or other technique. Projects should seek results other farmers can use and must have the potential to add to our region's knowledge about sustainable agriculture. Awards are capped at $15,000 and projects may address the wide range of issues that affect farming throughout the Northeast and Mid-Atlantic. Applicants must work with a technical advisor who serves in a consulting capacity. For further information and to apply, visit https://www.nesare.org/Grants/Get-a-Grant/Farmer-Grant. Please contact grant coordinator Carol Delaney at Carol.Delaney@uvm.edu with questions.

NEWS

State New Briefs

Invasive Weeds Palmer Amaranth and Waterhemp Require Monitoring this Fall

Palmer Amaranth and Waterhemp are two herbicide resistant invasive pigweeds that can drastically reduce crop yields once they become established in crop fields. They reproduce from seed produced by pigweeds that escaped or plants that were not cut low enough during the harvest. Plant height of only one foot allows development of nodes that can produce viable seed this fall, particularly, if the weather is mild.

Flushes of Palmer and Waterhemp pigweed may be controlled with select herbicides or with tillage. Precautions should be taken to thoroughly clean harvesting equipment to prevent introduction of the pigweed seeds into new fields.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2018.*

Farmers in Chesapeake Bay Watershed Can Be Reimbursed for Conservation Planning Costs

A state grant program that reimburses farmers in the Chesapeake Bay Watershed for the cost of professional assistance with conservation planning is back for another year.

Farmers can be reimbursed up to $6,000 for the cost of hiring consultants to complete required Manure Management, Agriculture Erosion and Sediment Control, Nutrient Management, and Conservation plans. Plans developed during 2017 or later are eligible for reimbursement as long as they were not developed by the Natural Resources Conservation Service (or with NRCS funding), developed for Resource Enhancement and Protection Program (REAP) tax credits or developed for acres that previously received reimbursement through this program.

Applications are due by April 1, 2019 and grants will be awarded on a first-come, first-served basis.

Farmers in Bradford, Cameron, Carbon, Centre, Clearfield, Clinton, Columbia, Elk, Jefferson, Lackawanna, Luzerne, Lycoming, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Susquehanna, Tioga, Union, Wayne, and Wyoming counties should contact Sara Bolton of Larson Design Group at sbolton@larsondesigngroup.com or 570.374.5700.

Farmers in Adams, Bedford, Berks, Blair, Cambria, Chester, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Indiana, Juniata, Lancaster, Lebanon, Mifflin, Perry, Somerset, and York counties should contact Jedd Moncavage of TeamAg at jeddm@teamaginc.com or 717.721.6795.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2018.*

Learn About the Latest in Cover Cropping at Upcoming Conference

Farmers have an opportunity to learn about improving soil health and maximizing other benefits from cover cropping at the second Northeast Cover Crops Council Conference next month in State College. The conference is scheduled for Nov. 15 and 16 at the State College Ramada Hotel and Conference Center and Penn State's Russell E. Larson Agricultural Research Center at Rock Springs. In addition to keynote presentations from Ontario grain farmer Blake Vince and University of Maryland soils professor Ray Weil, there will be breakout sessions, presentations on the latest research and a field day. Learn more at http://northeastcovercrops.com/annual-conferences/2018-neccc-conference-information/.

*From **Farm Bureau Express**, Penna. Farm Bureau, October 19, 2018.*

Open Enrollment for Health Care Starts Soon

The open enrollment period of finding health insurance starts soon. And Pennsylvania Farm Bureau's Health Services Division is here to answer your questions and help you shop for the best plans and rates through a variety of insurance companies in Pennsylvania to find the coverage that best fits you and your family. The open enrollment period for individual and family health coverage runs Nov. 1 through Dec. 15. Open enrollment for senior and Medicare coverage runs now through Dec. 7. PFB Health Services also offers group dental and vision coverage. Open enrollment for group dental and vision coverage runs Nov. 1 through Dec. 31. Contact a Health Services representative today at 800.522.2375. Representatives are available Monday through Friday, 8:00 a.m. to 5:00 p.m. Learn more at www.pfb.com/healthservices.

*From **Farm Bureau Express**, Penna. Farm Bureau, October 19, 2018.*

Farm Labor Session at Farm Bureau Annual Meeting

The Pennsylvania Farm Bureau is offering an educational seminar entitled "Farm Labor 101: Helping Fruit & Vegetable Producers Understand Agricultural Labor Laws" on Monday, November 12, from 2:00 to 3:15 at the Hershey Lodge in Hershey. The session is open to all grower.

The speaker will be Sean High, Staff Attorney, Penn State Center for Agricultural & Shale Law. Producers face numerous complex federal and state agricultural labor laws. Unfortunately failure to comply with these laws could result in costly sanctions. This seminar will provide attendees with information regarding legal requirements through a guided agricultural labor law self-assessment and agricultural labor law fact sheets. Issues to be covered include: minimum wage, overtime, child labor, migrant and seasonal workers, and other laws affecting fruit and vegetable producers.

Be a Keystone... *(continued from page 3)*

The Board of Directors has approved the following uses for the annual interest earned by the Keystone Fund:

Two annual $1,000 student scholarships that will are awarded according to criteria set by a special committee. The committee has awarded a total of twelve scholarships to date.

Half of any remaining interest is given to the Penn State Plant Pathology Department as a general research grant in support of the vegetable pathologist's ongoing research work.

The other half of any remaining interest is given to the Penn State Entomology Department as a general research grant in support of the vegetable entomologist's ongoing research work.

The special research grants from the Keystone Fund were designated for the Plant Pathology and Entomology Departments at this point in time rather than the Plant Science Department because the Association for several years gave $10,000 a year to partially support a research technician in the Plant Science Department. This support comes from the Association's General Fund. As interest rates have declined over the past several years, these research grants have grown smaller unfortunately. *(continued on page 8)*

NEWS

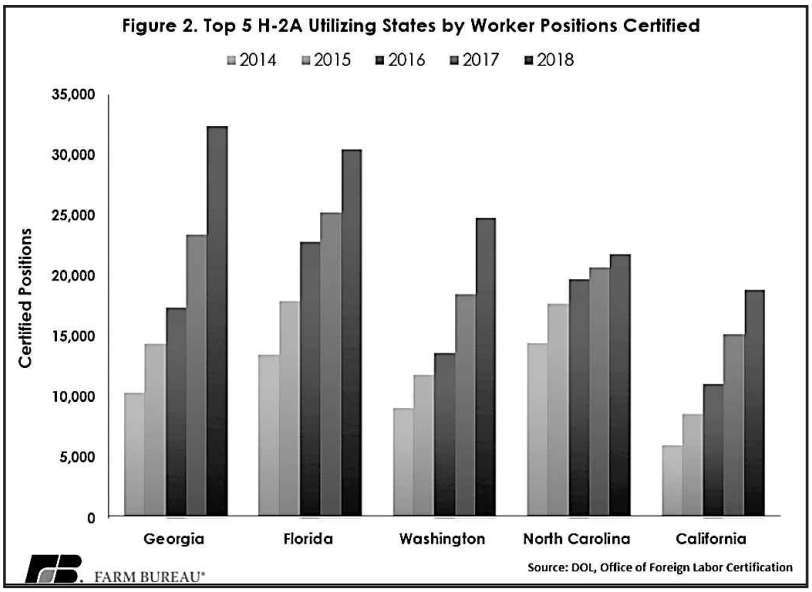
H-2A Seminar... (continued from page 1)

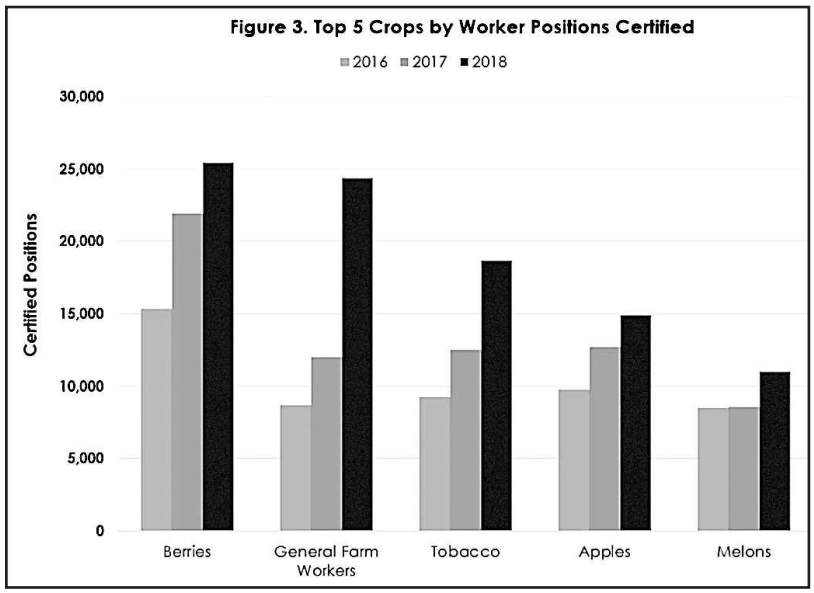
tions, surpassing Florida, which led the nation in certified H-2A positions in 2015, 2016 and 2017. Georgia was able to capture the title for the first time with an incredible 38 percent increase in certified positions between 2017 and 2018. As is highlighted in Figure 2, all of the top five H-2A utilizing states experienced position growth between 2017 and 2018. Even more incredible is the increase over the last five years. Between 2014 and 2018, Georgia, Florida, Washington, North Carolina and California experienced growth rates of 212 percent, 125 percent, 174 percent, 50 percent and 213 percent, respectively. Louisiana, Kentucky, New York and Arizona, all among the top 10 states over the last five years, also experienced growth in FY 2018, increasing by 14 percent, 3 percent, 11 percent and 24 percent, respectively. The state of Michigan completes the top 10 list with 8,359 positions, a growth of 24 percent from 2017. Michigan's position as the seventh-largest user of the H-2A program is especially impressive given that it only just made the top 10 list for the first time in 2017.

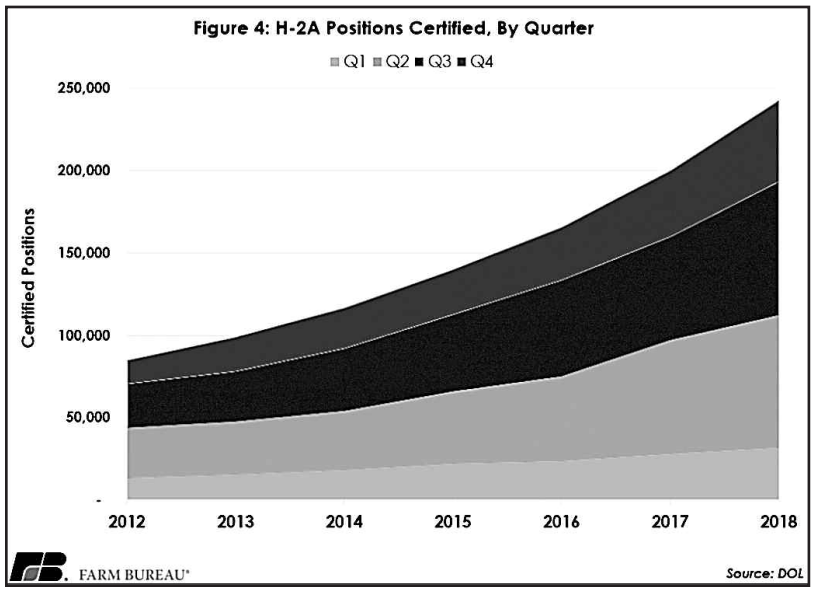
Among crops, growers of berries continue to be the largest users of the H-2A program. Growers of blackberries, blueberries, cranberries, raspberries and strawberries, the primary berry crops, had more than 25,000 positions certified in FY 2018 – a 16 percent increase over FY 2017. The same crops have been in the top five for the last three years – berries, general farm work, tobacco, apples and melons - though the relative order has changed significantly. In FY 2018, after berries, general farm workers were the second most requested and certified worker position. In FY 2018, DOL certified more than 100 percent additional general farm worker positions than in FY 2017. The number of certified positions for tobacco, apples and melons positions grew by 49 percent, 18 percent and 29 percent, respectively, from FY 2017 to FY 2018.

As previously mentioned, DOL certified nearly a quarter of a million positions in FY 2018. This is 108 percent more than the number of positions certified in FY 2014, just five years ago, ands more than double the number of positions in a very short time span—with no sign of a slow down any time soon.

Ms. High is an economist with the American Farm Bureau Federation. From the American Farm Bureau website at fb.org. Used by permission.







Be a Keystone... (continued from page 6)

Suggested Keystone dues are based on a member's gross income from vegetables, potatoes or berries instead of being a flat rate. However, any member who pays dues of $75 or more is considered a Keystone member regardless of their gross income. The amount of Keystone dues paid by individual members is not published so as not to disclose their gross income. Keystone dues are added to the principal of the Keystone Fund, thus increasing the potential amount of interest available each year.

Keystone membership is open to all vegetable, potato and berry farm operations, processing firms and allied industry firms. Associate Keystone Members are additional family members or employees of Keystone Members. The following farms, firms and persons are Keystone or Associate Keystone Members for 2018:

(continued on page 23)

NEWS

Volunteer Now for Ag Literacy Week

The Third Annual Pennsylvania Ag Literacy Week will be held March 18-22, 2019. The Pennsylvania Friends of Ag Foundation, through Ag Literacy Week, coordinates with an individual in agriculture to read a book and complete an activity. PFB and the Foundation are looking to recruit individuals in agricultural from across the state to participate. These persons need only purchase the book and volunteer their time to read to children (kindergarten through second). Along with reading the book, and leading students through a simple activity, persons in the ag community will also have the chance to talk about their experience in agriculture and then donate the book to the classroom.

In 2019, volunteers will read Right This Very Minute which connects the foods we find ourselves wanting during the day to the work farmers are doing right this very minute to grow, raise and produce our food. The PA Friends of Agriculture Foundation will supply all the necessary materials and instructions for you, as well as additional lesson plans to accompany the book for the classroom teacher to use after the visit.

We are looking to leaders throughout Pennsylvania's agricultural industry to be part of this event. As your organization is a valued partner with Pennsylvania Farm Bureau and one that supports agricultural literacy, we would like to collaborate with you on this initiative. For this partnership to work, we need you and the members of your organization to be the face of agriculture in your local community by volunteering to be readers and donating $10 a book per classroom. To learn more about Ag Literacy Week and to register to be a Reader, visit www.pfb.com/agliteracy.

Due to deadlines to order books and materials, the deadline for registration is December 15th, so NOW is the time to start reaching out to the Kdg-2nd grade teachers in your local schools. Please share this with your membership to promote this program and bring agricultural literacy to the students across your county.

Attached you will find the following items to assist in explaining, promoting and participating in the program:

Ag Literacy Week Brochure: To be shared with those individuals or groups that may be interested in being a Volunteer Reader with our program, so they can better understand the program and know the steps to participate; and

Kdg-2nd grade classroom teachers to explain the program and why they might want to have their classroom participate with us.

Ag Literacy Week Classroom Information Form: To be used by Volunteer Readers, once they've identified the classroom(s) where they will read, to collect the necessary classroom information to complete the Ag Literacy Week registration process.

If you have any questions, or would like more brochures, please email us at alw@pfb.com or call Tonya at 717-731-3545. Thank you in advance for your promotional efforts and your participation!

NEWS

Pick the GAP for You!

Ken Petersen

In the past year, the Specialty Crops Program has modernized the USDA Good Agricultural Practices (GAP) program to make our food safety verification audits a single tool that growers of all sizes can use to meet multiple and complex regulatory and market-access requirements. In the August issue of this newsletter, we talked in detail about how we aligned USDA Harmonized GAP audits with the requirements of the Food Safety Modernization Act's (FSMA) Produce Safety Rule and attained technical equivalence of the USDA Harmonized GAP Plus+ audits with the Global Food Safety Initiative (GFSI).

We've been receiving some specific questions about our audit offerings and the changes we made. Here are some frequently asked questions and answers that may answer any questions you have:

What is the best USDA GAP audit for me?

We offer a variety of voluntary GAP audit services, from the updated Harmonized GAP and Harmonized GAP Plus+ audits to commodity-specific audits for mushrooms, tomatoes, leafy greens and cantaloupes. You can choose the USDA GAP audit service that best meets your and your buyers' needs.

For market access, I need:	Global Food Safety Initiative Technical Equivalence	FDA FSMA Produce Safety Rule Alignment	Produce GAP Harmonization Initiative Alignment	Adherence to Industry and FDA Best Practices
USDA Harmonized GAP Plus+	X	X	X	X
USDA Harmonized GAP		X	X	X
USDA GAP&GHP				X

To make all of our services accessible to producers of all sizes, we also offer GroupGAP, a service option that allows producers and others to pool resources to undergo USDA GAP certification.

What is a USDA Harmonized GAP audit?

The USDA Harmonized GAP audit was developed as part of the Produce GAP Harmonization Initiative, an industry-driven effort to create food safety GAP standards and audit checklists for pre-harvest and post-harvest operations. The Initiative is a collaborative effort on the part of growers, shippers, produce buyers, audit organizations, and government agencies, including USDA. The USDA Harmonized GAP audit, is a single audit that is applicable to all fresh produce commodities, all sizes of on-farm operations, and all regions in the United States.

How does the USDA Harmonized GAP Plus+ service relate to other USDA GAP programs?

USDA offers several types of GAP audit services. USDA GAP audits are our basic service. These audits are aligned with industry best practices and Food and Drug Administration (FDA) recommendations. USDA Harmonized GAP audits meet industry best practices, FDA best practices AND are aligned with the Produce GAP Harmonization Initiative and the Food Safety Modernization Act's (FSMA) Produce Safety Rule. The new USDA Harmonized GAP Plus+ audits include all USDA GAP and Harmonized GAP alignments AND are recognized by GFSI.

How does the alignment of the USDA Harmonized GAP Audit with the FSMA Produce Safety Rule help the specialty crop industry?

The alignment of USDA's Harmonized GAP program for specialty crops with the requirements of the Food and Drug Administration's (FDA) FSMA Produce Safety Rule provides growers with an opportunity to better understand how their operations align with FDA's regulatory requirements for the specialty crops sector. This voluntary, user-fee funded audit program provides a tool that verifies food safety practices have been implemented to help keep our nation's food supply safe.

Why did USDA undertake GFSI technical equivalence?

We undertook the GFSI benchmarking process at the request of many grower groups, commodity boards, trade associations, and others in the specialty crops sectors, who asked us to align the USDA GAP Program with GFSI to reduce audit fatigue and the costs of multiple food safety audits. Now that the USDA Harmonized GAP Plus+ program is GFSI technically equivalent, the more than 4,000 growers, packers, and handlers who are our customers can use a USDA GAP audit to also meet the requirements of the many retail, food service, and institutional buyers that require their suppliers to undergo a GFSI-benchmarked food safety audit. With GFSI technical equivalence, USDA is helping increase marketing opportunities for specialty crops producers and expand purchasing options for buyers.

We hope that these questions and answers provide the information you need to put the USDA GAP program to work for you. If you'd like to learn more, please check out the Good Agricultural Practices (GAP) & Good Handling Practices (GHP) page of the AMS website at https://www.ams.usda.gov/services/auditing/gap-ghp or contact USDA's Specialty Crops Inspection Division, Audit Services Branch at (202) 720-5021 or SCAudits@ams.usda.gov.

*Mr. Petersen is the **Chief of the Audit Services Branch of the Specialty Crops Division of USDA Agricultural Marketing Service.** From the **Specialty Crops Newsletter,** USDA-AMS, October 2018.*

PA Preferred™

Grown in PA. It makes a difference.

Phosphorus Management for Vegetable Farmers

Katie Campbell-Nelson

Over the last few years, some growers have started wondering: "How did my soil phosphorus levels get to be so high and what can I do about it to keep from being a source of phosphorus pollution?" UMass Extension hosted a symposium in 2016 on 'Managing Phosphorus in Organic Residuals Applied to Soils' with experts and professionals from all over the region and we now have a better understanding about how to tackle that question. We learned that phosphorus supply and demand are unevenly distributed across the US, with New England being a net importer of P in the form of fertilizer and feed (human and animal). The excess P then stays in our area as manure. We can improve P management by using local sources of food, animal feed, and fertilizer, rather than importing it from other areas. Highlights from the symposium about soil phosphorus dynamics, soil testing and interpretation, and P mitigation strategies are included here to help growers take some practical steps toward improved P management.

Soil Phosphorus Dynamics

Fertilizer phosphorous comes mostly from fossilized bones and is rapidly fixed by binding with minerals and becoming unavailable to plants once applied to soil. Organic forms of phosphorus applied—including manure, compost, biosolids, or cover crops—become available more slowly than commercial fertilizers through the growing season, depending on microbial activity, which is influenced by temperature, moisture, and soil fertility. In cold soils (below 50°F), the mineralization of P from organic sources by microbes is slowed down, so additions of more rapidly available forms of P generate a crop growth response. Phosphorous from fertilizer or decomposing organic matter is highly soluble and will erode away if not incorporated into the soil. When incorporated, P will quickly (within a few hours) bind with iron, aluminum, calcium or magnesium (depending on soil pH) (Fig 1). Once bound, phosphorous becomes available for plant uptake only very slowly (possibly years). Incorporated P can still contribute to pollution when soil particles containing P erode with wind or water. In most soils, there is plenty of Fe, Al, Ca and Mn to bind P so the most common source of P pollution occurs as surface runoff from unincorporated fertilizer or organic matter. An actively growing root system is one of the best ways to cycle P and reduce potential for erosion. The concentration of soluble P needed for growth of agronomic crops is about 0.2 ppm, while only 0.02 ppm (10x lower) is all it takes for aquatic plants to grow and cause eutrophication in aquatic systems—this is why phosphorus can so quickly cause water pollution.

Phosphorus Testing and Interpretation

A good practice is to take soil samples at the same time each year (usually fall) to monitor soil test P levels over time and find out if they are increasing, which would indicate that more P is being applied than is being removed by crops. Following are methods of P extraction and when you might use them:

Modified Morgan extraction reflects what nutrients are available in one growing season: dissolved in soil water, sorbed

(continued on page 12)

Phosphorus Management... *(continued from page 11)*

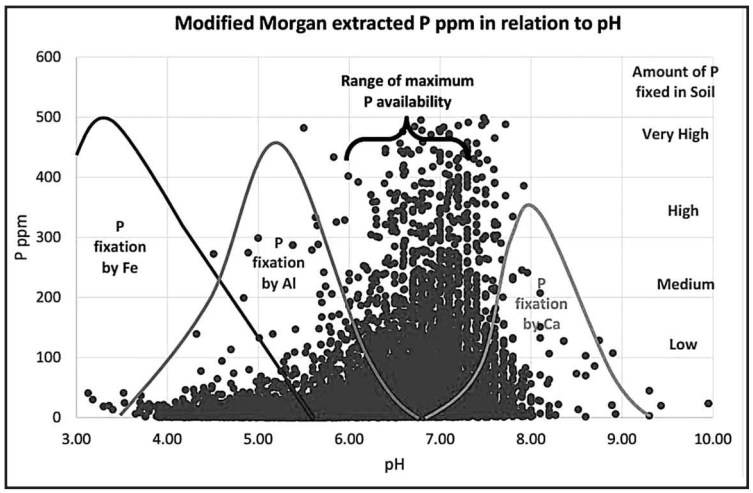


Figure 1 by Katie Campbell-Nelson. The red dots represent Modified Morgan extracted P levels in ppm from over 24,000 soil samples analyzed at the University of Massachusetts and Maine soil labs in 2015. Area underneath the blue lines represent P fixation by iron and aluminum phosphates at low pH and calcium phosphate at high pH.

to mineral surfaces, and in organic matter decomposing that year. This method is still considered the most accurate soil analysis method for New England soils because it has been widely used to conduct nutrient management studies and correlate crop yield to fertility amendments in our region. This is the standard test used by MA, VT and CT soil testing labs. Until 2012, the UMass soil lab considered soil test P levels to be "above optimum" when soils exceeded 40 ppm. With recent research showing that P was leachable in certain soil settings at 40 ppm, and data showing that crops do not require more than 14 ppm P to achieve maximum yields, soil test interpretation were changed and now soils with >14ppm P are categorized as "above optimum". Therefore, you may have seen a change in interpretation of test results that were not due to any change in your farming practice.

If soil test P levels are high or above optimum (>14ppm Modified Morgan extracted P), the risk of P pollution may still be low. Phosphorus becomes a threat to the environment when there is a combination of source AND transfer. Risk of pollution may only be assessed if there is enough information about how the P may be transported to water. For example, there is high risk of pollution from P applications on frozen ground, on slopes greater than 7%, or within 25 ft. of a water source. In these scenarios, a field with low or below optimum P levels may actually pose a greater risk of pollution than a high-P field, especially if P was applied right before heavy rains. Another example of poor P management would be spreading compost onto a field in the fall without incorporation or without a cover crop, because the P may runoff in the spring as snow melts and transports it to nearby streams. Soils with above optimum P are not a threat to the environment if there is low overland water movement or soil erosion. Keeping a living ground cover is your best protection against P pollution.

Water Extractable P: When testing organic residuals (e.g. compost* or biosolids), water extractable P (WEP) is a useful analysis for determining immediate risk of runoff. Water extractable P represents the P that is available at the time of application for plant uptake (or potential runoff). *Note: The UMass soil lab no longer offers compost analysis but below are labs that offer testing services discussed in this article.

Total Phosphorus: Most labs, including UMaine and UMass, also offer one of the EPA methods (3050 or 3051) for "total labile P". These methods use boiling concentrated nitric acid and hydrochloric acid to destroy all organic matter, and strip all Al and Fe surface coatings. Sand, silt, and clay particles are left intact. This is usually a regulatory method to quantify the total pool of reactive P in soil and eroded sediment. Much of this total P will remain permanently or semi-permanently unavailable to plants in the field.

UMass Soil and Plant Nutrient Testing Laboratory
- Services: Modified Morgan
- Web: http://soiltest.umass.edu/
- Phone: 413-545-2311
- Email: soiltest@umass.edu

UMaine Analytical Lab and Soil Testing Service
- Services: Modified Morgan, manure, compost, TP and WEP
- Web: https://umaine.edu/soiltestinglab/
- Phone: 207.581.2945
- Email: hoskins@maine.edu

UConn Soil Nutrient Analysis Laboratory
- Services: Modified Morgan
- Web: http://www.soiltest.uconn.edu/
- Phone: 860-486-4274
- Email: soiltest@uconn.edu

Penn State Agricultural Analytical Service Lab
- Services: manure, compost, TP and WEP
- Web: http://agsci.psu.edu/aasl
- Phone: 814-863-0841
- Email: aaslab@psu.edu

UVM Agricultural and Environmental Testing Lab
- Services: Modified Morgan, manure
- Web: https://www.uvm.edu/pss/ag_testing/
- Phone: 802-656-3030

(continued on page 13)

Phosphorus Management... (continued from page 12)

Email: AgTesting@uvm.edu

Spectrum Analytic
Services: Modified Morgan, manure
Web: http://www.spectrumanalytic.com/
Phone: 1-800-321-1562
Email: info@spectrumanalytic.com

Dairy One
Services: Modified Morgan, manure
Web: http://dairyone.com/
Phone: 1.800.344.2697 or 607.257.1272
Email: mark.joyce@dairyone.com

Phosphorus Mitigation Strategies

Symposium attendees came up with quite a few creative P mitigation strategies during round table discussions. Here are some that are applicable to vegetable growers:

- Identify areas on the farm where there is a large source of P and high risk of transport. Develop a P mitigation strategy for these fields first.
- When using organic residuals, it is easy to over-apply P when trying to meet a crop's N demands due to the ratio of N:P in the materials. Therefore, calculate P content before making compost or manure applications to meet crop needs, then use an N-based fertilizer such as urea, alfalfa or soybean meal to meet the crop's N needs.
- Do not surface apply organic residuals such as manure or compost before heavy rain.
- If soil test P levels are above optimum, experiment with lower P applications by leaving it off of a few hundred row ft of crop, especially in early spring plantings and then keep track of yields.
- Reduce soil compaction.
- Convert areas of highest risk for P transport to buffer strips.
- Make banded rather than broadcast applications of P-containing materials whenever possible, and incorporate material to 2 inches below seeding depth to allow roots to grow down to meet the P.
- If P-containing residual or fertilizer is applied, consider incorporation to increase mineral binding and applying to planted cover to reduce potential soil erosion caused by tillage.
- Use low-P sources of organic residuals such as leaf mulch compost instead of food waste or manure-based compost. Poultry litter and pig manure have the highest P-content of compost-based fertilizers because those animals lack the enzyme which stabilizes P; ruminants have this enzyme.
- Consider growing high yielding crops such as corn and removing crop residues after harvest.
- Use 'hyperaccumulator' cover crops like mustard, Johnson grass, corn and sorghum or alfalfa to take up P from the soil, then remove and compost the material or feed it to animals to recycle the P.
- Manage soil pH to a range between 6.5-7.2 first, then get a soil test and amend with P afterwards, only if needed.
- Conduct a whole-farm nutrient balance worksheet, making sure to credit all sources of P including from organic residuals and cover crops.
- Conduct a risk assessment using the Phosphorus Index to determine risk of P pollution from a particular field. Contact

(continued on page 14)

VEGETABLE PRODUCTION

Preparing for the Fall Flight of Allium Leafminer

Ethan Grundberg, adapted Susan B. Scheufele

This article was written for New York State and adapted for the New England states but some of the information will be relevant to Pennsylvania.

The fall generation of allium leafminer (ALM) is active now and oviposition marks are now being seen on leek foliage across southeastern NY and likely in any other areas where this pest has become established. ALM affects all alliums but is especially damaging to fall leeks since there are few other allium hosts around and can cause serious losses at harvest and in storage. This new invasive pest was introduced from Europe into Pennsylvania in 2015 and has been found consistently in Pennsylvania, New Jersey, and New York since then. ALM was found for the first time in MA this spring, in the Berkshires.

Life Cycle: There is a spring generation of ALM which peaks in late-May, and then the pest is dormant until about this time of year when the adults re-emerge from pupation sites either inside allium bulbs and stems or in the soil where earlier onion plants had been. Though we do not have predictive models to help us determine the likely date of emergence of the fall generation, ALM adults emerged from pupae near the end of September in Pennsylvania in 2016 and were active for 4-6 weeks. This year scouts in southeastern NY first identified the fly on September 11th but only began to see widespread activity and oviposition scars this past week. Efforts are underway now throughout the Northeast to dial in on the pest's life cycle and determine exactly when these flights occur, you can help by reporting any signs to your local cooperative extension office or contacting us at umass vegetable@umass.edu or at (413) 577-3976.

Damage: Since there are typically fewer cultivated and wild alliums in the environment in the fall, growers have experienced a "concentration effect" with their fall allium crops. The spring generation of ALM is able to spread across a wider and larger host population, but since the fall ALM flight has fewer host plants (leeks, chives, and scallions) to choose from, the damage to those crops is more severe, with up to 80% crop losses reported in areas where this pest has

Adult ALM oviposition marks on onion leaf. Photo: E. Grundberg

(continued on page 15)

Phosphorus Management...

(continued from page 13)

your local NRCS office for help with conducting the P-Index analysis.

- Maintain regular soil testing practices using the Modified Morgan for soils and ask for testing results of organic residuals wherever you source them from.
- Reduce the amount of P that is imported into our region and onto our soils by using local sources of organic residuals rather than purchasing P fertilizer. Organic residuals such as compost have the added benefit of increasing soil organic matter and water holding capacity which will also reduce P runoff.

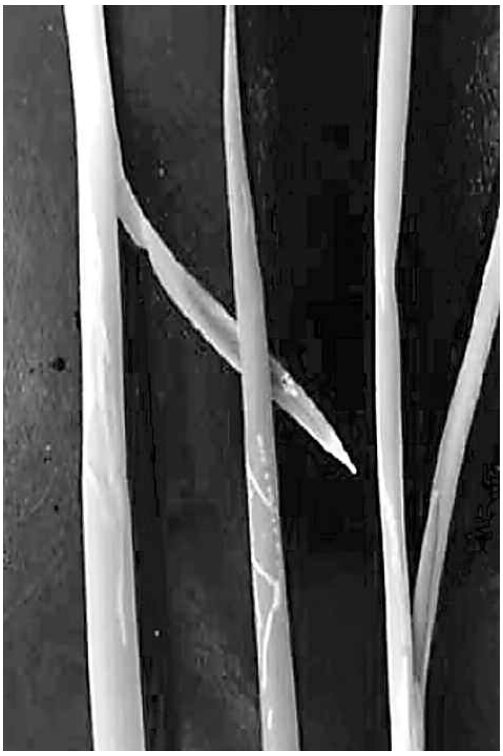
Thanks to Jennifer Weld, PhD Candidate, Soil Science Project Associate and Dr. John Spargo, Director, Agricultural Analytical Services Lab, Penn State University and Dr. Amy Shober, Associate Professor and Extension Specialist Plant and Soil Sciences, University of Delaware and Ned Beecher, Director, Northeast Biosolids and Residuals Association.

Resources:

Presentations from November 2, 2016 Symposium "Managing Phosphorus in Organic Residuals Applied to Soils": https://www.nebiosolids.org/managing-p-in-organic-residuals-applied-to-soils.

Ms. Campbell-Nelson is with the Univ. of Massachusetts Extension Vegetable Program. From ***Vegetable Notes for Vegetable Farmers in Mass.,*** *Univ. of Mass. Ext., Vol. 30, No. 24, October 4, 2018.*

Preparing for the Fall... *(continued from page 14)*



ALM larval mining on scallions. Adult oviposition marks also visible on middle leaf. Photo: T. Rusinek

ALM pupae in leek. Note the soft rot in the larval mines. Photo: T. Rusinek

established. Oviposition scars and feeding mines can affect marketability of the harvested crops because of cosmetic damage to the green foliage, but more importantly, these wounds also allow for entry of soft rotting bacteria into the bulb, and this leads to severe rot on the shelf or in storage.

Management: Effective strategies for limiting damage from ALM this fall are to use row cover to exclude flies—ideally this would have already been done but it may not be too late—and to spray fields where the level of damage is unacceptable. Focus management efforts on alliums that still have lush green growth in the field (storage onions that are still field curing are not at risk) to prevent adults from landing on host crops. Insecticide efficacy trials are underway, and our current recommendations are limited to insecticides labeled generally for leafminers that can be used on alliums—Dan Gilrein of CCE-Suffolk County has reviewed these options and made them available at https://cdn.extension.udel.edu/wp-content/uploads/ 2012/03/01070448/ Critical-Updates-for-2017-Mid-Atlantic-Vegetable-

(continued on page 16)

Aphids in Melons

Gerald Brust

Several reports were received this season of very deformed watermelon plants, but also of cucumber and cantaloupe plants. These distortions (Fig. 1) are being caused by melon aphids *Aphis gossypii* Glover in most cases. Melon aphids are small and range in color from a light/dark green mottle (Fig. 2), which is most common to whitish, yellow (seen during hot, dry weather), pale green, and dark green almost black forms. The legs are pale with just the tips of some parts black. The cornicles also are black. One trait of melon aphids that make them particularly difficult to manage is that unlike other aphids, their populations do not fade with higher summer temperatures. Immatures look like adults, only smaller.

Female melon aphids give live birth to clones of themselves during spring and summer and their populations can increase very rapidly especially when hidden on the underside of foliage. One of the things to look for to see if you have an actively growing aphid population is white cast skins of the aphids. Aphids must shed their skins to grow so lots of skins show that the aphids are actively growing (Fig. 2, orange arrows). The faster they grow the faster they become adults and can begin to reproduce. The reproductive period lasts about two weeks with a female producing 65-85 offspring in that time. The ideal temperature for reproduction is around 70-80°F., which are the temperatures we are experiencing now. There is evidence that there are host races, i.e., melon aphids reared on cotton can be transferred successfully to okra but not to cucurbits. This inability to transfer from one host to another has been shown for other crop combinations.

Melon aphids feed on the underside of leaves and can be a major problem on young plants when they feed near the tips of vines, sucking sap and nutrients from the plant. Their feeding causes a great deal of distortion and leaf curling, hindering the photosynthetic capacity of the plant (Fig. 1). The foliage may become chlorotic and die prematurely. They also secrete a great deal of honeydew which allows the growth of sooty mold and further reduces the photosynthetic ability of the infested plant. One of the other major problems with melon aphids (as with other aphid species) is that they are good at transmitting potyviruses such as cucumber mosaic virus, watermelon mosaic viruses, and zucchini yellow mosaic virus. It must be noted that these viruses are transmitted despite insecticide applications, which include oil sprays. This is mostly because the aphids can transmit these nonpersistent viruses within 15 seconds of reaching the plant.

Figure 1. Watermelon plant with heavy melon aphid population

Management

No thresholds have been established for melon aphid in cucurbits. Reflective mulches laid before planting can repel aphids from plants reducing or delaying virus transmission, until vine growth covers-up the plastic. In smaller fields, row covers can be used. Biological control can have a significant impact on aphid populations and is our first line a defense.

(continued on page 20)

Preparing for the Fall...

(continued from page 15)

Recommendations-Guide.pdf. Organic growers unable to use row cover are encouraged to consider applying Entrust (spinosad, IRAC Group 5) at the 2 oz/acre rate along mixed with a 1%-1.5% v/v solution of M-Pede (potassium salts of fatty acids) for better penetration of the waxy cuticle once adult feeding has begun. Pay close attention to maximum application restrictions for each active ingredient if crops have already been sprayed with insecticides for onion thrips management this year AND to the labeled preharvest intervals. As always, you must follow the instructions in the label for all pesticides!

We suspect that the geographic distribution of ALM will continue to spread this fall, so growers in southwestern New England and especially in the Berkshires should be on the lookout for signs of activity. We are recommending that growers thoroughly inspect allium leaves for oviposition marks by checking at least 10 plants on each field edge weekly, from mid-September through October. If you have any questions about what you are seeing in your fall alliums, please contact us at umassvegetable@umass.edu or at 413-577-3976.

Mr. Grundberg is with Cornell Cooperative Extension and Ms. Scheufele is with the Univ. of Massachusetts Extension Vegetable Program. From ***Vegetable Notes for Vegetable Farmers in Mass.,*** *Univ. of Mass. Ext., Vol. 30, No. 24, October 4, 2018.*

NEWS

MID-ATLANTIC
fruit & vegetable convention

January 29 to 31, 2019 Hershey Lodge, Hershey, PA

Pre-Convention Tour & Workshops - January 28 -

FSMA Food Safety Training, Pros and Cons of Thinning Apples Early, Irrigation Basics, High Tunnel Berry Production, Greenhouse Production, Introduction to Social Media, PA Pesticide Applicator License Training

***Farm Market Bus Tour** - visiting Oak Grove Farms in Mechanicsburg, Quality Greenhouses in Dillsburg, Maplewood Produce in Shippensburg, Paul's Country Market in Waynesboro and Windy Knoll Market and Creamery in Chambersburg*

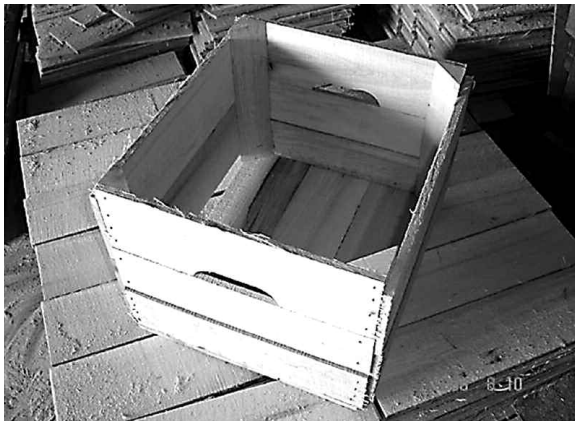
Keynote
Andy Masters
Leadership and Customer Service

Educational Sessions on all 3 days with over 40 sessions

January 29 — Keynote, Season Extension/High Tunnels, Organic Vegetables, Tree Fruit, General Vegetables, Wholesale Marketing, Irrigation, Wildlife Controls, Allium Pests, Snap Beans, Cut Flowers, Edible Flowers, Food Trends, Farm Market Bakeries

January 30 — Tomatoes, Tree Fruit, Stone Fruit, Farm Market Trends, Farm Market Financial Management, Small Fruit, Wine Grapes, Greenhouse Ornamentals, Soil Health, General Vegetables, Spanish

January 31 — Sweet Corn, Pumpkins & Vine Crops, Peppers & Eggplant, Greenhouse Vegetables, Potatoes, Tree Fruit, Stone Fruit, Small Fruit, Pollinators, Farm Management, Creative Direct Marketing, Social Media Skills



VEGETABLE PRODUCTION

Optimum Conditions for Storage Crops

A. Brown, A Cavanagh, R. Hazzard, B. Sideman and G. Higgins

	Storage	Notes	Ethylene Sensitivity*
Potato	Lower temperature gradually to 40-45°F for tablestock or seed. Store at 50°F for chip stock varieties. Maintain RH at 90%. Store 5-8 months.	Curing and storage environments must be dark to prevent greening. At colder temperatures, starches convert to sugar.	LOW
Sweet potato	Store at 55-60°F at 90% RH. Well-cured roots can store for up to a year in optimal conditions.	Starches in roots convert to sugars for the first 30 days post harvest; wait until 3 weeks after harvest for best flavor. Avoid chilling injury by keeping roots above 50°F. Chilling injury promotes root decay and decreases storage potential.	MODERATE (causes discoloration)
Winter Squash	Store at 55-60°F and 50-75% RH. Storage potential varies with variety, from 2-6 months.	Avoid chilling injury in field or storage, which occurs when temperatures are below 50°F. Injury increases as temperature decreases and/or length of chilling time increases. Decay accelerates after chilling. High temperatures decrease flesh quality, and high RH promotes decay.	MODERATE (causes discoloration)
Onion	Store at 32°F and 65-70% RH. Avoid condensation by cooling gradually and maintaining steady temperature. Storage potential depends on variety.	As onions mature, their dry matter content and pungency increase. Onions produced from seeds store longer than those from sets. High temperature increases sprouting, high RH stimulates root growth, and the combination increases likelihood of rotting.	LOW
Garlic	Store at 32°F and 65-70% RH. Seed garlic should be stored at 50°F. Garlic should keep for 6 to 7 months at 32°F.	High temperatures (>65°F) cause dehydration, intermediate temperatures (40-65°F) promote sprouting, and high RH promotes root growth and molding.	LOW
Carrot	Store carrots at 32°F and 98- 100% RH. Can be stored 5-9 months. Potential storage time increases with higher RH.	May be stored washed or unwashed. Washing immediately after harvest may reduce disease incidence in storage. Storing with ethylene- producers (like apples), and wounding and brusing during washing, can cause bitterness.	HIGH (causes bitterness)
Parsnip	Store at 32°F and 90-95% RH with greens removed. Parsnips will keep for 2-6 months at optimum conditions.	Starches in parsnip roots convert to sugars at cold temperatures. Early fall dug parsnips can be induced to sweeten with a short (2-3 weeks) cold storage treatment.	HIGH (causes bitterness)
Beet, Radish, Turnip & Rutabaga	Store at 32°F and 95% RH with greens removed. Radishes can be stored for 2-4 months, turnips and rutabaga for 4-5 months, and beets for 4-6 months.	Low humidity causes shriveling and weight loss, and shortens storage life.	LOW
Cabbage	Store cabbage at 32°F and 98-100% RH. Can last 4-6 months in optimum conditions.	Cabbage and other Brassicas freeze at 30°F, and storability starts to decrease at >34F. Presence of light in storage can decrease leaf yellowing during storage.	HIGH (pomotes leaf yellowing, wilting, and abscission)

*Crops that produce significant amounts of ethylene during storage include: apple, pear, peach, plum, cantaloupe, tomato, plus several tropical fruits.

(continued on page 20)

Grafted Watermelons Revisited

Gordon Johnson

Research on grafted watermelons has expanded in the last 5 years on the US East Coast. There are two main reasons for using grafted watermelon plants: 1) to manage soil-borne diseases such as Fusarium wilt and 2) to increase plant productivity by providing a more vigorous root system.

Grafted watermelons are widely used throughout the other major watermelon producing areas of the world including southern Europe, the Middle East, and the Far East. However, use in the US has been limited, largely due to wider availability of land for production and the added cost of grafting plants. Grafted plants are currently 4 times more costly than non-grafted plants.

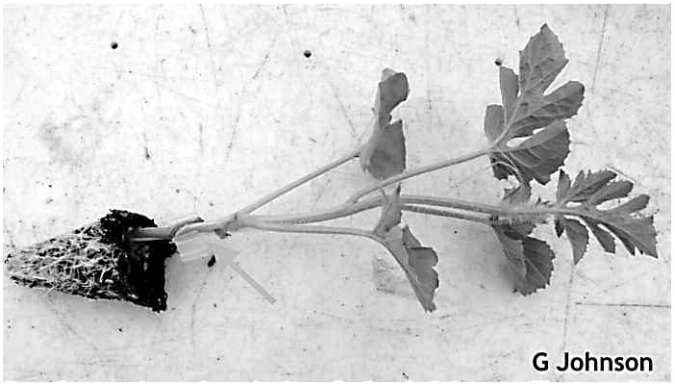
Watermelon are commonly grafted onto interspecific hybrid squash (*Cucurbita maxima* x *Cucurbita moschata*) or bottle gourd (*Lagenaria siceraria*). These will have Fusarium wilt resistance. Interspecific hybrid squash rootstocks have chilling tolerance in addition to the disease resistance, but some rootstocks may be so vigorous that they delay flowering if fertilization is not managed properly. Another issue with interspecific squash rootstocks in some cases is a reduction in watermelon sugar content (Brix) as well as off flavors. Bottle gourd rootstocks have chilling tolerance and less vigor then squash rootstocks, and have little effect on fruit quality or flowering.

Neither bottle gourd nor interspecific squash rootstocks have root knot nematode (RKN) resistance and are very susceptible to RKN injury. Work at the USDA in Charleston, SC has identified some wild watermelon rootstocks with root knot resistance and these may be available as rootstocks in the future.

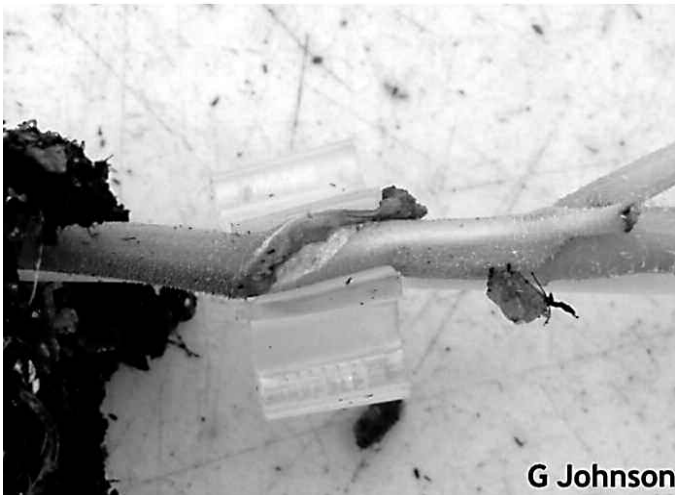
With wider availability of grafted watermelons, costs per plant have been reduced. Studies also have shown that productivity of grafted watermelons is 30-50% higher than non-grafted plants, that grafted plants can be planted at two thirds of the population of non-grafted plants to achieve those yields and that grafted plants require much less fertilizer to produce those results. Partial budget economic analyses have shown economic advantages using grafted watermelon plants. In one analysis, the above effects lead to a net change in profit of over $1300 per acre using grafted plants.

In 2016 trials in Delaware, the seedless variety "Fascination" that was grafted using interspecific Cucurbita rootstock, and planted at 78% of population of ungrafted Fascination, yielded 22% higher. Fruits were heavier and there were significantly more fruits in the second and third harvests compared to ungrafted Fascination.

Dr. Johnson is the Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the ***Weekly Crop Update****, Univ. of Delaware Extension, Vol. 25, Issue 12, June 16, 2017.*



Seedless watermelon plant grafted onto interspecific squash rootstock. Arrow points to the graft union and plastic grafting clip.



Close up of graft union. Watermelons are more difficult to graft than other vegetables.

Scab of Cucurbits

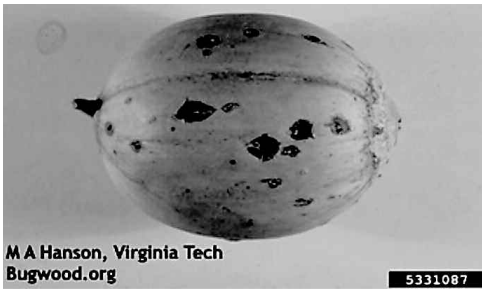
Kate Everts

Cool wet weather is associated with several vegetable diseases. One of these is scab on cucurbits, caused by the fungus *Cladosporium cucumerinum*, which is favored by temperatures at or below 70°F and wet weather.

Watermelons are highly resistant to scab, and many cucumber cultivars also have resistance (see the Commercial Vegetable Recommendation Guide for a list of resistant cucumber varieties). However, summer and winter squash, pumpkin, gourds, muskmelon and honeydew are susceptible. Symptoms vary somewhat depending on the cucurbit crop. However, leaf lesions appear as water-soaked, pale green to grey or white and angular. Dead leaf tissue cracks and looks "ragged" and is sometimes referred to as shot-holed. Fruit may have sunken spots (summer squash or susceptible cucumber), or raised scabby lesions (butternut squash). Scab should be managed by using resistant cultivars when available, and rotating out of susceptible crops (cucurbits) for two years. Application of chlorothalonil is also effective.

*Dr. Everts is the Vegetable Pathologist at the Univ. of Delaware and the Univ. of Maryland. From the **Weekly Crop Update**, Univ. of Delaware Ext., Issue 26:11, June 8, 2018.*

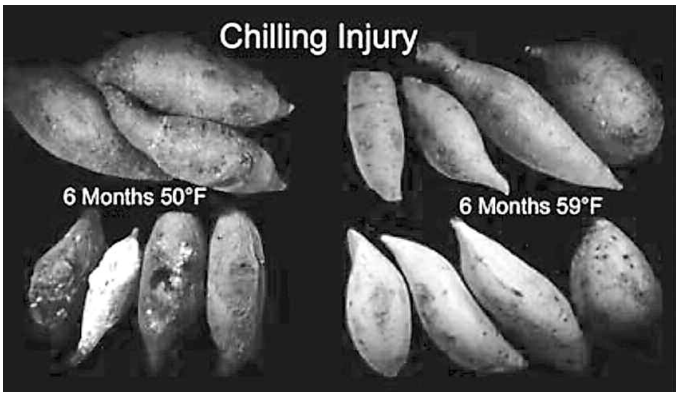
Scab lesions on summer squash



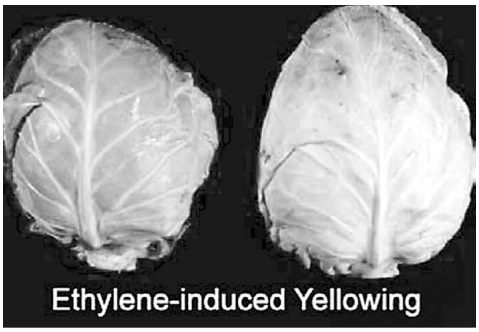
Scab lesions on cantaloupe

Optimum Conditions...

(continued from page 18)



Sweet potato chilling injury. (photo: Leonard Morris, Univ. of California Davis)



Ethylene-induced yellowing on cabbage. (photo: Don Edwards, Univ. of California Davis)

*Originally written in October 2011 by A. Brown, A Cavanagh, and R. Hazzard at the Univ. of Massachusetts, and B. Sideman at the Univ. of New Hampshire. Funded by Northeast SARE Winter Vegetable Project UMass - UNH - CISA – SEL. Updated January 2018 by G. Higgins, UMass Extension Vegetable Program. From the **Vegetable Notes for Vegetable Farmers in Massachusetts**, Univ. of Mass. Ext., Vol. 30, No. 1, January 11, 2018.*

Aphids in...

(continued from page 16)

Therefore, weekly sprays of insecticides should not be used in watermelon unless really needed. Because cantaloupe and cucumber are very susceptible to bacterial wilt disease, which is vectored by striped cucumber beetles several insecticide sprays may be necessary. However, resistance by melon aphids to organophosphates and pyrethroid insecticides is common. Using neonicotinoids for beetle control will help control aphids, but the neonics should not be sprayed exclusively and pyrethroids or other insecticide classes should be used intermittently for beetle control.

Figure 2. Melon aphids on underside of leaf

While many of the above suggestions are all good to prevent aphid problems what do you do once you have them? Organically there are not many good aphid control tactics to use once they show up. Applications of rosemary oil or insecticidal soaps or horticultural oils are options. These will have to be applied several times with thorough coverage of the foliage being critical for control of the pest. Rosemary oil will disrupt beneficial populations less so than soaps or oils. There are several synthetic controls that will work if thorough coverage is obtained. These chemical controls include: methomyl, dimethoate, acetamiprid, clothianidin, thiamethoxam, pymetrozine, flonicamid and combination products that include one of these. Be sure to read the label before applying any chemicals. It should be noted that a plant damaged as severely as the one in Figure 1 will not recover to produce a crop.

*Dr. Brust is the IPM Vegetable Specialist at the Univ. of Maryland. From the **Weekly Crop Update,** Univ. of Delaware Extension, Issue 26:12, June 15, 2018.*

Nematodes for Insect Control

Vern Grubinger

Nematodes are small worms. Really small – microscopic, in fact. They're sometimes referred to as roundworms or eel-worms. Some nematodes are friends, some are foes, and some could be considered neutral. It all depends on their eating habits. Of the thousands of kinds of nematodes, some feed on insects, some eat plant roots, while others consume bacteria or are parasites of animals. Nematodes are found all over the world in many kinds of habitats. For farmers, the nematodes of interest are soil-dwellers that either attack crop roots (bad nematodes) or feed on insect pests (good nematodes).

Bad nematodes. These are called plant parasitic nematodes. They either attack plants from the outside (ectoparasitic) or they live inside the host plant for part of their lives (endoparasitic). Both these nematodes inject saliva into their host plants that results in damage, either by killing tissue or causing the creation of many giant cells that form galls. There are many kinds of plant parasitic nematodes, and most have a relatively narrow host range. A few nematodes, such as the root-knot nematode and the root-lesion nematode, attack many kinds of crops. Damage from nematodes includes stunting, chlorosis, and root distortion.

Good nematodes. Enough bad news; let's focus on beneficial nematodes, how they work, and how to best use them. The following information comes from the fact sheet "Insect-Parasitic Nematodes for the Management of Soil-Dwelling Insects" by Dr. Mary Barbercheck, Department of Entomology at Penn State University. Insect-parasitic nematodes help farmers by providing 'biological control' of soil-dwelling insect pests. These nematodes occur naturally in the soil, or they can be purchased and introduced. They are relatively easy to mass produce and are available from several commercial labs as 'biological insecticides' which are exempt from EPA registration. These nematodes can infect many kinds of insects, but they don't infect birds or mammals.

Big names worth knowing. The nematodes commonly used as biological control agents for soil pests belong to the families *Steinernematidae* and *Heterorhabditidae*. Some commercially available nematode species are: *Steinernema carpocapsae, S. feltiae, S. riobrave, Heterorhabditis bacteriophora, H. marelatus*, and *H. megidis*. These nematodes are generally used for management of soil insect pests in high value crops.

How they kill insects. These nematodes carry bacteria in their bodies that are toxic to insects. That's why they are called 'entomopathogenic' nematodes. Entompathogenic is the scientific term for 'insect-killing'. The nematodes and bacteria are always found together because they depend on each other. The bacteria need the nematodes to deliver them into the insects, and the nematodes need the bacteria for food and to create conditions in the insect that allow it to reproduce. The bacteria are safe to animals and have only been found in association with these nematodes and infected insects, never living freely in soil.

What Goes Around, Comes Around. Nematodes are only deadly to insects at one stage in their life cycle, called the infective juvenile, or IJ. This is the only time that the insect-pathogenic nematode exists outside of the host insect. Infective juvenile nematodes in the soil seek out insects then enter them through their natural body openings. Once inside the insect body, the nematodes release their bacteria, which multiply and eventually kill the host. But not before the nematodes develop into adults, reproduce, and produce offspring. A few weeks after the initial infection, the new generation of nematodes develops into infective juveniles, and thousands of them emerge from the dead insect and search for new insect hosts in the soil.

Applying Insect-Parasitic Nematodes. Because these are living organisms special attention needs to be paid to their handling, application, and selection of species to match the crop. Nematodes need adequate moisture, moderate temperatures, and protection from direct sunlight during application. Their natural home is in the film of water around particles 7 of soil, so commercial formulations of beneficial nematodes are usually soil-applied. They should not be sprayed on plant foliage unless specifically formulated for that use.

Nematodes are typically applied in water at a rate of about 1 billion per acre, depending on the crop. They can be applied with conventional chemical application equipment, but nozzle filters or screens smaller than 50-mesh will clog and it is best to remove screens in nozzles when applying nematodes with a back-pack sprayer or spray rig. Care should be taken when using hydraulic pumps that have high internal pressure and high shear force as these will shred the nematodes.

Nematodes tend to settle in the tank, so agitation must be provided for uniform application. Nematodes can be killed by excessive tank agitation through sparging (recirculation of a portion of spray mix) or excessive mechanical stirring that is used to keep the nematodes in suspension. Pump pressure above 300 pounds per square inch or temperatures above 85°F will kill nematodes.

It is best to apply nematodes to moist soil in the early morning or late evening when air temperatures are between 60 and 85°F. A pre-application irrigation can be applied to moisten the soil and a post-application irrigation can be applied to wash any nematodes on plant surfaces to the soil surface. The post-application irrigation should be applied before spray droplets dry and must provide a tenth to a quarter inch of water to allow the nematodes to move into the upper soil layers, out of sun or drying air exposure. Applications can be made before or even during a rainfall to wash nematodes to the soil surface.

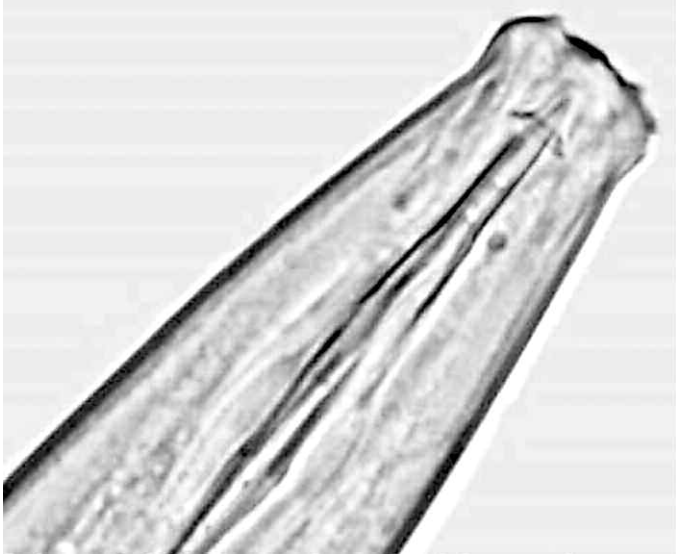
Successful application of nematodes is influenced by spray volume. Most nematode labels suggest volumes of two to six gallons of spray per 1000 square feet (87-260 gallons per acre). This is achievable for many boom sprayers and lawn shower nozzle sprayers that are equipped with sufficiently large nozzles. Some turf applicators use shower nozzles that deliver 1 to 1.5 gallons of spray per 1000 square feet. When lower spray volumes are used, pre- and post-application irrigation can be adjusted to counteract the problem of low volume sprays and to assist in moving the nematodes to the soil and off exposed surfaces.

Nematodes can also be applied with irrigation. However, some irrigation systems, especially low volume trickle systems, may not move water fast enough to keep nematodes suspended. When in doubt, check periodically by taking a sample at the emitters to determine if live nematodes are being moved through the system.

When Do They Work, and Why? Success using nematodes for insect control has been mixed. Their effectiveness has been highest in highly controlled systems such as nursery containers and mushroom houses where environmental conditions highly

(continued on page 22)

Nematodes for... *(continued from page 21)*



Steinernema feltiae *(mouth pictured here), is an omniverous nematode that enters the insect through natural openings, then releases toxic bacteria which spreads and kills the insect. Photo: R. Wick*

suitable for the nematodes can be maintained. Besides improper conditions, most failures with field applications are due to a poor match between the nematode species and target insect pest. Using the right kind of nematode for the insect pest you wish to control is critical because nematode species vary in their host range and in their host-finding behavior.

Some nematodes are very active in the soil ('cruisers') and search around for a host insect, while some tend to sit and wait for a host insect to pass by in close proximity ('ambushers'). Cruiser nematodes will be more effective than ambushers at finding a sedentary insect host, like white grubs. The ambushers are effective at infecting active insect hosts, such as cutworms or mole crickets. Some known appropriate pathogen-host targets are *S. glaseri* against the Japanese beetle; *S. scapterisci* against mole crickets; *S. riobrave* against cutworms and citrus weevils; and *S. feltiae* against sawfly larvae and fungus gnat larvae.

As with any purchased natural enemy, quality of the product can affect efficacy. Quality of the product can be affected by batch, and shipping, storage, and application conditions. Nematodes are living organisms and are subject to destruction by excessive cold or heat, and lack of moisture or oxygen. A small sample of the mixed product should be checked with a hand lens or magnifying glass to observe living, moving nematodes. Nematodes that are very straight and motionless may be dead, and therefore, ineffective.

Dr. Grubinger was the Vegetable and Berry Specialist with the Univ. of Vermont Extension. This article originally published in August 2005. From the ***Vegetable Notes for Vegetable Farmers in Massachusetts****, Univ. of Mass. Ext., Vol. 29, No. 6, May 11, 2017.*

Rainshelters for Vegetable and Fruit Production

Gordon Johnson

I had an interesting conversation with a Delmava-based crop consultant on the use of rainshelters for vegetable and fruit production. As the climate is expected to become wetter with more extreme rainfall events, losses of vegetable and fruits to excess rain will become more of a concern.

A rainshelter is a high tunnel structure that is used to cover plants during fruit formation and development. Multi-bay "European" style tunnels are most commonly used as rain shelters covering from ½ acre to several acres. Rain shelters are used extensively in high rainfall areas such as England to protect rainfall sensitive crops such as strawberries. Covers may be used for the whole season or just for the fruiting period.

Rainshelters are also used for tomatoes and other fruits such as cherries which are susceptible to cracking. Some fruits crack from absorbing water through the skin of the fruit when they are ripe or near ripe, others crack with excess water in the root zone, and there can be a combination of the two processes. Rainshelters control both types of fruit cracking. Rain shelters also reduce foliar wetting and rain splash and therefore can reduce fungal and bacterial diseases considerably if left on for the whole growing cycle.

While a high tunnel will serve as a rain shelter, less expensive low-tunnel structures can also be used that have a plastic cover over hoops from 2 to 6 feet tall.

Rain shelters have been shown to improve the quality of tomatoes throughout the growing season and can be a valuable tool to increased marketable fruits of high quality. They are also useful for fruit crops such as cherries, strawberries, brambles, grapes, and blueberries. Specialty melons prone to cracking will also benefit from the use of rainshelters.

Dwarf cherries being grown under a rain shelter.

Dr. Johnson is the Vegetable and Fruit Extension Specialist at the Univ. of Delaware. From the ***Weekly Crop Update****, Univ. of Delaware Ext., Issue 26:12, June 14, 2018.*

Be a Keystone... *(continued from page 8)*

Amsterdam Produce Enterprises (Robert Amsterdam) - *Mechanicsburg*
Baronner Farms (Robert Baronner) - *Hollidaysburg*
Lady Moon Farms (Thomas Beddard) - *Chambersburg*
Triple B Farms (R.J. and Willam Beinlich) – *Monongahela*
Benshoff Farms of New Germany (James Benshoff) – *Summerhill*
Bitler Farms (Timothy Bitler) – *Birdsboro*
Catochtin Mt. Orchard (Robert Black) – *Maryland*
Cristner Farms (Matthew Christner) – *Dawson*
Master Made Farms LLC (Ronald Clark) – *Quarryville*
Daffin Agri Enterprises, Inc. (John Daffin) – *Maryland*
Certis USA (Tim Damico) - *Maryland*
Dudas Farm (Roberta Dudas)- *Fairview*
Dymond's Farm Market (Christopher, Fred III, and Timothy Dymond) - *Dallas*
Fred W. Eckel's Sons (Keith Eckel) - *Clarks Summit*
Ridge Road Farms LLC (Joseph and Monica Farabaugh) – *Carrolltown*
Douds Floyd Farm (Philip Doud Floyd) *Aliquippa*
Pete's Produce Farm (J. Peter Flynn) – *West Chester*
Furmano Foods (Donald Bergey, Don Geise, Scott Hoffman, James Kohl, Kenneth Martin) - *Northumberland*
Graceland Farm Market (Jonathan Grace) – *Grove City*
Graver's Orchards (Richard Graver) – *Lehighton PA*
Haupt Produce (Wilford J Haupt*)* – *Paxinos*
B & R Farms (Barron Hetherington) – *Ringtown*
Hopkin's Farm (E. Harry Hopkins) - *Falls*
Indian Oven Farms (Edward C. Hopkins) – *Falls*
Cedar Run Produce (John M Hurst) *East Earl*
Yara North America (Wes Johnson) – *Kentucky*
Harvest Valley Farms (Arthur, David and Larry King, Caleb Costanzo) – *Valencia*
Peaceful Acres Farms (Clair King) – *Cochranville*
Gerald R. King – *Cochranville*
Kreiders Market (J. Lloyd Krieder) – *Kirkwood*
Kitchen Table Consultants (Ted Lebow) - *Collegeville*
Harvest View Farm and Market (Kenneth Metrick) - *Butler*
Miller Plant Farm (David Miller) – *York*
General Store Farm Market (David Moyer) – *Birdsboro*
Daniel's Farm Store (Justus Nolt) – *Leola*
Michael Orzolek – *State College*
Institute for Plant Based Nutrition (James Oswald) - *Bala Cynwyd*
Richard Pallman – *Clarks Summit*
Palmers Farm (Neil Palmer) – *Greensburg*
The Accidental Agronomist (Monica Pape) - *Annville*
Peters Produce (Dennis S. Peters) - *Red Lion*
Nells Venture (Herbert Pollock) – *Indiana*
Pumpkinhill Produce Farms (Harry N. Roinick, Jr.) – *Nescopeck*
Red Wagon Farm (Eric Ross) – *Columbia Station, OH*
Sample's Vegetable Farm (Steve Sample) - *Duncannon*
Dan Schantz Farm and Greenhouse (Daniel Schantz, Patrick Flanley) - *Zionsville*
Jim's Farm Produce (James Schrig) – *West Abington Twp.*
Shenot Farms (Edward & Robert Shenot) – *Wexford*
Snyder's Farm Market (George A Snyder) – *Grampian*
The Barn at Soergel Hollow (Reed Soergel) – *Evans City*
David Sokoloski – *Beaver Falls*
Stauffer Huling Farm – *Sandford, FL*
William and Cheryl Troxell - *Richfield*
Glenn Troyer Farms Inc (Ellery Troyer) - Waterford
Van der Grinten Farms (Peter Van der Grinten) – *Guilford, CT*

North American Strawberry Meetings Set for Feb. 3 to 6

All members of the international strawberry community are invited to attend the 9th North American Strawberry Symposium (NASS), a meeting of strawberry growers, researchers, and other industry members from around the globe, to be held in conjunction with the annual NASGA conference, Feb. 3-6, 2019, at the Wyndham Orlando Resort in Orlando, Florida. Florida is the US leader in winter strawberry production and features a strong partnership between Florida strawberry producers and the University of Florida. This partnership is reflective of the purpose of this conference, which brings together growers and scientists worldwide to spur innovation.

We will kick-off the Symposium on Superbowl Sunday (Feb 3) with workshops in the afternoon, followed by a welcome reception "In The Red Zone". We welcome you to meet and greet strawberry friends while watching the game together on a big-screen TV, or in a quieter setting nearby. We'll enjoy two days of research presentations, marketing presentations, poster sessions and an award luncheon, followed by a post-conference tour February 6. The tour will feature a 600-acre strawberry farm, a robotic harvester demonstration, and field research at the University of Florida Gulf Coast Research and Education Center. The Program Committee is committed to making this a world-class research symposium for growers and scientists, and we look forward to seeing you in Orlando at the peak of the strawberry season.

The program will highlight emerging technologies like precision agriculture, automation, and robotics. Proceedings articles from the presenters are strongly encouraged and will be published in a special issue of the International Journal of Fruit Science. Workshop topics (Feb 3): Automation and Precision Agriculture, Physiology and Production Management, Sustainable Organic Copping Systems, Strawberry Breeding Tools and Tips, Alternatives to Fumigation, Weed Management Approaches, Insect and Mite Management, Disease Management: From Nursery to Fruit Production Fields.

On-line registration or mail-in form, and more program details are available on the NASGA website at http://www.nasga.org/. Please spread the word to strawberry growers.

CLASSIFIED

Equipment

WANTED TO BUY – Pixall CP100 Sweet Corn Harvester - call 570-444-6006 9

FOR SALE – Square Bale Strawberry Mulcher on its own trailer. Excellent Condition. Stored Inside

One-Row Zimmerman Picking Assistant - Excellent Condition. Stored Inside Call 814-229-3706 10

FOR SALE - Retail Garden Center and USDA Organic Produce Farm. Prime Location on MD 213 (a National Scenic Byway), Cecilton, Maryland located between the scenic Sassafras and Bohemia rivers. High traffic volume. Site plan approved for more development than utilized currently. Turn-Key operation. Deep well. BAT septic system. 10.6 acres zoned highway commercial, with 1400' road frontage. Town water and sewer accessible. Call 410-275-9438 or email vic@priapigardens.com for complete information.

Pennsylvania Vegetable Growers Association
815 Middle Road
Richfield, Pennsylvania 17086-9205
717-694-3596
pvga@pvga.org
www.pvga.org

PRESORTED
STANDARD
U.S. POSTAGE
PAID
MIDDLEBURG PA 17842
PERMIT NO. 26

Address Service Requested

PA Preferred
Grown in PA. It makes a difference.