PENNSYLVANIA
VEGETABLE GROWERS

NEWS

September 2020 / Volume 43 Number 9

PVGA Young Grower Award Applications Being Accepted

The "PVGA Young Grower" award was a new award established four 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. Unfortunately, there were no nominees for 2019 but in 2020 two young growers were recognized: Wesley Nell and Nick Lubecki. 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;
- is successfully growing vegetables, potatoes or berries; 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 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, 2020.

Brandon Christner

Peter Salerno III

Nick Lubecki

Wes Nell and family

Needed: Nominations for PVGA Directors

The terms of seven members of the PVGA Board of Directors expire at the Annual Meeting tentatively scheduled for Wednesday, February 3, 2021. The Directors whose terms expire are:

Robert Amsterdam – Mechanicsburg – first elected 2018

Brian Campbell – Berwick – first elected 2007

Peter Flynn – West Chester – first elected 2018

Arthur King – Valencia – first elected 2018

Amy Metrick – Butler – first elected 2018

Michael Orzolek -State College – first elected 2015

Mark Troyer – Waterford – first elected 2015

All the directors are eligible for re-election although under changes adopted three years ago at the 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 after the 2021 Annual Meeting. The Board currently has 19 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 Jon Strite, who as Past President serves as chair of the Committee, at jstrite1979@gmail.com.

NEWS

In Memory
Edward C. Hopkins

PVGA Life Member and former President Edward C. Hopkins passed away on September 21st at the age of 98 after a brief illness.

He was born on July 1, 1922, the son of the late Harry and Avis (Dorsheimer) Hopkins of Newton. His ancestors included pilgrims who settled at Plymouth Rock and Stephen Hopkins, one of the signers of the Declaration of Independence.

He graduated from Newton-Ransom High School in 1940. After graduation, like his father and grandfather, Ed became a farmer He married his high school sweetheart, the late Helen (Keihn). He served as the state president of the Future Farmers of America in 1942.

Ed was progressive in using irrigation and hybrid seeds to excel in the production of quality, prize-winning vegetable crops, putting in long hours in the field with his family. He was especially known for his tomatoes which he sold to some of the area's best restaurants. He helped start the Scranton Cooperative Farmers' Market where he tended market throughout his farming career. He served as a PVGA director for many years and was elected the president in 1970 and 1971. In 2012, was honored with a PVGA life membership. He also served as president of the former Berwick Vegetable Coop and was a member of the Waverly Masonic Lodge.

Fiercely independent, he was committed to his family, American values and the land. Ed received an award for voting in every federal, state, and municipal election for 77 straight years. He stayed informed on the issues of the day by daily reading numerous newspapers and magazines. Former U.S Senator Hugh Scott in 1973 remarked in a speech at Tunkhannock that "Few men better represent the spirit of America than Ed Hopkins."

He was preceded in death by his wife Helen, three sisters and one brother. He is survived by five children, including Beverly Talley of Santa Monica, CA, Patricia Williams and her husband Paul of Clarks Green, E. Harry and his wife Ruth of Zephyrhills, FL, Cathy Mazaleski and her husband Peter of Newton-Ransom, and Helene and her husband Michael Colaneri of Scranton; brothers Bruce of Wyomissing and Roy of Clarks Summit, sisters Helen G. Hopkins of Scranton and Ruth Warburton of Tunkhannock; former daughter-in-law Nancy Hopkins of Falls; his grandchildren Mark and William Hopkins, Laura Rosencrance, Lenny Mazaleski, and Katherine Grabau of Los Angeles, CA; seven great grandchildren; four great great grandchildren; step grandchildren and step great grandchildren; and numerous nieces and nephews.

Memorial contributions for vegetable research may be made to the PA Vegetable Marketing and Research Program, 2301 N. Cameron St., Harrisburg, PA 17110. Please note on the check that this is "In memory of Ed Hopkins".

*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 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 Director, at the above address.

NEWS

Agritourism Bill to be Considered

The state House may soon take a vote on House Bill 1348, which would grant farms that offer agritourism activities reasonable protection from frivolous lawsuits that arise from circumstances beyond their control. It's important that your representative hears from YOU why this legislation is so important to Pennsylvania farmers.

Pennsylvania Farm Bureau held a news conference recently at Paulus Mt. Airy Orchards in York County urging the General Assembly to adopt the reforms this year, before the legislative session ends and all progress on outstanding bills is reset.

"Agritourism is a win-win for farmers who want to diversify their businesses and for community members who want to connect with local farms through fun activities," PFB President Rick Ebert said. "But the threat of frivolous lawsuits is a significant barrier for farmers who want to begin or continue inviting the public onto their farms. Farms are natural environments and despite farmers' best efforts to ensure guest safety, it is impossible to eliminate every hazard. House Bill 1348 would give reasonable protection and peace of mind to farmers who are offering agritourism in a safe manner."

Ebert was joined at the news conference by state Rep. Barb Gleim (R-Cumberland County), the prime sponsor of House Bill 1348; state Rep. Danilo Burgos (D-Philadelphia), a co-sponsor of the bill; and Karen Paulus, who owns and operates the orchard along with her husband, Dan.

To receive the protections offered by House Bill 1348, farms would have to warn visitors of potential risks by either having them sign a waiver or printing a disclaimer on a ticket or other material that's given to visitors. The measure would not give farms a free pass from ensuring guest safety and farms could still be held accountable if they fail to fix or warn patrons of obvious and dangerous safety risks.

Please click the button below to contact your representative today and ask them to support this much-needed and commonsense reform to help farmers continue to engage with consumers, secure their futures and grow Pennsylvania's rural economy.

*From **Farm Bureau Express**, Penna. Farm Bureau, September 18, 2020..*

USDA Reopens, Expand COVID-19 Aid to Farmers

The U.S. Department of Agriculture has announced a second round of its Coronavirus Food Assistance Program, which provides direct payments to farmers to help with losses suffered due to the COVID-19 pandemic. USDA will accept applications for its $14 billion "CFAP 2" program starting Monday. The deadline to apply is Dec. 11.

Payments are limited to $250,000 per person or entity. Corporations, limited liability companies, limited partnerships may qualify for additional payment limits when members actively provide personal labor or personal management for the farming operation. There is an Adjusted Gross Income limit of $900,000, except for producers who make at least 75 percent their income from farming, ranching or forestry-related activities. Applicants must also be in compliance with Highly Erodible Land and Wetland Conservation provisions.

Several commodities that were not eligible for the first CFAP program will now be eligible, including broilers, more types of eggs, turkey and other specialty livestock, additional fruit and vegetable crops, honey, maple sap, and more. More than 230 fruit, vegetable, horticulture and tree nut crops are eligible.

Growers can apply online at https://www.farmers.gov/cfap or through their USDA Service Center. Growers can also contact USDA at 877-508-8364. Farmers who applied for the first CFAP program should find the application process to be easier for the second round because USDA likely has many of their documents already on file.

*Adapted from **Farm Bureau Express**, Penna. Farm Bureau, September 18, 2020.*

National News Briefs

Help Tell USDA How to Improve Farmer Experience

The U.S. Department of Agriculture wants to know how its agencies can better serve farmers.

The Department will conduct an annual survey of farmers to understand what the Farm Service Agency, Natural Resources Conservation Service, and Risk Management Agency are doing well and where they can improve.

The survey includes 20 questions and takes approximately 10 minutes to complete. Responses are confidential, and individual responses will be aggregated.

Learn more and take the survey at www.farmers.gov/survey.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Trump Issues Executive Order on Rural Health

A new directive from President Donald Trump aims to expand rural communities' access to telemedicine during the COVID-19 pandemic.

The executive order aims to expand the availability of certain telehealth services and allow more practitioners to provide telehealth services.

The order directs the U.S. Departments of Agriculture and Health and Human Services to develop and implement a plan to improve rural health options by expanding access to communications infrastructure in rural communities. It also directs HHS to develop a new payment model and regulatory flexibility to help ensure that rural healthcare provider are able to provide the necessary level and quality of care.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Northeast Sustainable Agriculture Research and Education Program Searching for Proposals for the Farmer Grant Program

The Northeast Sustainable Agriculture Research and Education (SARE) Program has released the call for 2021 Farmer Grant applications. Proposals are due online by Nov. 17 at 5 p.m. ET. Farmer Grants provide research funds for commercial farms to explore new ideas in almost any aspect of production, marketing and other topics that influence successful farming in the 12 Northeast states and the District of Columbia. Reviewers look for innovation, potential for improved sustainability and results that will be useful to other farmers. Application materials, including

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State News Briefs

PASS Program Receives $10 Million Boost

A state program that connects the charitable food system with surplus products from Pennsylvania farms will be able to ramp up its efforts more than seven-fold thanks to an infusion of federal stimulus cash.

The state Department of Agriculture recently announced that $10 million of Pennsylvania's share of federal Coronavirus Aid, Relief, and Economic Security (CARES) Act funding will be used to bolster the Pennsylvania Agricultural Surplus System. The PASS program, which Farm Bureau supports and routinely advocates for, helps cover the costs associated with getting surplus farm products to the state's food banks, and ultimately families in need.

The additional funding—$5 million for dairy purchases and $5 million to purchase a variety of other products like fruit, vegetables, meat, and eggs—is a major ramp-up from the program's typical funding of $1.5 million a year. The state is partnering with Feeding Pennsylvania to administer the program.

"If there's anything worse than the waste of fresh, local food and the labor of love from Pennsylvania farmers, it's the hunger that more than two million Pennsylvanians are facing every day as we fight COVID-19," said Pennsylvania Secretary of Agriculture Russell Redding. "This is $10 million in relief for Pennsylvania farmers who have lost markets but have not swayed in their commitment to nourishing our commonwealth. It's $10 million in fresh, local food to go on the plates of families who were unsure of where their next meal would come from."

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Wolf Administration Visits Philabundance for Hunger Action Month

Secretaries from the departments of Agriculture and Human Services joined Philabundance and Feeding Pennsylvania to recognize Hunger Action Month and encourage continued support for Pennsylvania's charitable food network, which has seen an unprecedented rise in need amidst the COVID-19 pandemic and accompanying economic downturn. Pennsylvania's charitable food network and food assistance programs are available so anyone who is having trouble making ends meet during this economic uncertainty does not have to go hungry.

More than 2 million Pennsylvanians – including 630,000 children – do not have reliable access to adequate, nutritious meals and live in food insecurity every day. According to Feeding Pennsylvania, nearly 1 in 20 Pennsylvanians are newly food insecure.

"No one in Pennsylvania should ever go hungry," said Agriculture Secretary Russell Redding. "Through the generosity of our farmers and charitable food network partners like Philabundance, and through continued investment in programs like PASS that get excess food to hungry families, we are working to ensure that no one does go hungry. There is help available. If your family is facing that possibility, please take advantage of these resources. You are not alone."

Pennsylvania's charitable food network is a critical partner in fighting hunger in communities across the commonwealth. Food banks in Pennsylvania typically serve approximately 2.2 million people annually, but in the first three months of the public health crisis, these food banks had more than 5.5 million visits. The COVID-19 public health crisis has exacerbated food insecurity across nearly our entire commonwealth. Before COVID-19, three counties had a food security rate at or above 13 percent. Today, 64 of 67 counties are at least 13 percent food insecure, and 32 counties are at least 16.5 percent food insecure.

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National News Briefs *continued from page 3*

detailed instructions and supporting documents, are posted on the Northeast SARE website at www.northeastsare.org/FarmerGrant. Questions about the grant program should be directed to Candice Huber, grant program coordinator, at candice.huber@uvm.edu.

Farmer Grant projects must be conducted in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia or Washington, D.C. Grants are capped at $15,000 and projects can run up to two years. Applicants must work with a technical advisor (eg., a Cooperative Extension educator, nonprofit staff, crop consultant, veterinarian, another farmer, etc.) who provides support and advice to the farmer applicant.

Learn more about the Northeast SARE Farmer Grant program at: www.northeastsare.org/FarmerGrant. Contact the Pennsylvania state coordinator, Kristy Borrelli, at kab617@psu.edu or 814-863-9845 with questions.

Funding Available for Organic Certifications

The U.S. Department of Agriculture has funding available to help organic producers pay for the cost of their organic certifications.

Organic Certification Cost Share Program reimburses participants for up to 50 percent of the certified organic operation's eligible expenses, up to a maximum of $500 per scope. If additional funding is appropriated by Congress, the maximum may increase to $750 for up to 75 percent of eligible costs.

Applications are due Oct. 31 for reimbursements of eligible costs incurred between Oct. 1, 2019, and Sept. 30, 2020.

Learn more at www.fsa.usda.gov/programs-and-services/occsp/index or contact your Farm Service Agency county office.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Farmers Encouraged to Share Survey Assessing Farmworker Needs

The Northeast Center for Occupational Health and Safety in Agriculture, Forestry, and Fishing is researching how to better meet the needs of farmworkers amid COVID-19 and is asking farmers to share a confidential survey with employees.

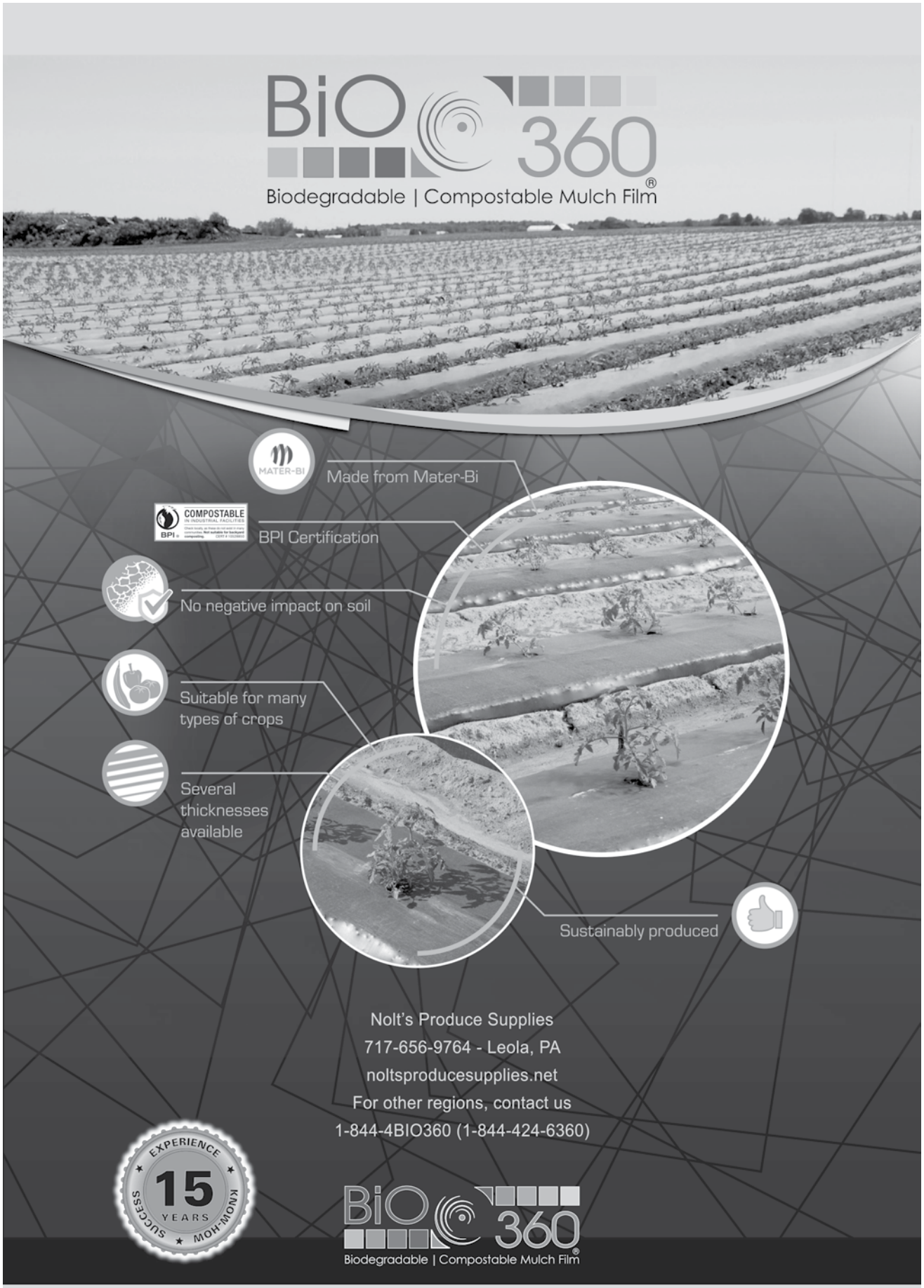
The information gathered will help create materials and programs to better serve farmers and their workers. The survey is voluntary, responses are confidential and no contact information will be collected.

The survey is available in English at: https://redcap.bassett.org/redcap/surveys/?s=NH8CHXX499.

The survey is available in Spanish at: https://redcap.bassett.org/redcap/surveys/?s=LND3MR9TPD.

You can also request paper copies or have your workers complete the survey over the phone by contacting Nicole Blanchard at 607.422.7527 or farmworkercovidsurvey@bassett.org.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*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Broadband Bill Clears State Senate

The state Senate recently passed a Farm Bureau-supported bill that would help expand broadband access in rural Pennsylvania.

Senate Bill 835—introduced by Sen. Wayne Langerholc of Cambria County—would create a special account for grants to develop broadband service in underserved areas. The grants, which would be overseen by the Commonwealth Financing Authority, would be funded by shifting an existing $5 million tax credit.

The bill now heads to the state House, which approved similar legislation earlier this year.

Expanding broadband access is among Pennsylvania Farm Bureau's chief legislative priorities. While high-speed internet is becoming more and more essential to agriculture, business and daily life—a reality underscored by the COVID-19 pandemic—many rural communities lack adequate access.

*From **Farm Bureau Express**, Penna. Farm Bureau, September 18, 2020.*

MAV Width Bill Advances in House

The state House Transportation Committee has given its approval to a Farm Bureau-supported bill that would change the state's vehicle code regarding the width of multipurpose agricultural vehicles (MAVs), commonly known as ATVs or side-by-sides.

The Senate Bill 995, sponsored by Sen. Dan Laughlin of Erie County, now heads to the full House for consideration. The Senate passed the bill earlier this year.

Currently, the state vehicle code requires that MAVs be no wider than 62 inches; however, newer models of side-by-sides are often up to 66 inches wide. Senate Bill 995, would change the vehicle code definition of an MAV to include vehicles up to 66 inches wide.

Farmers are allowed to operate MAVs in a limited capacity on roadways as part of their farming operations. Pennsylvania Farm Bureau wanted to make sure that farmers who had newer models of MAVs would still be able to legally move those vehicles on the road.

*From **Farm Bureau Express**, Penna. Farm Bureau, September 18, 2020*

Agriculture's Concerns Highlighted During Forum

Even as Pennsylvania farmers have faced unprecedented challenges amid the COVID-19 pandemic, they have continued to focus on their important mission to feed their neighbors and the world, Pennsylvania Farm Bureau President Rick Ebert said during a recent virtual forum on agriculture.

Ebert noted that the pandemic came as farmers were expecting a year of recovery after years of market volatility, low prices and trade disputes. Instead, the pandemic left many producers without a market and caused commodity prices to plunge.

"Across all commodities, farmers continue to do what they do best," Ebert said. "We take care of our animals, grow our crops and make sure our workers are safe."

His comments came during a virtual forum on Pennsylvania agriculture hosted by U.S. Rep. Glenn "G.T." Thompson. In addition to Ebert and Thompson, Pennsylvania Secretary of Agriculture Russell Redding and Bill Northey, USDA Under Secretary for Farm Production and Conservation, spoke and fielded questions.

Ebert also highlighted Farm Bureau's legislative priorities and discussed how federal relief programs have served as a lifeline for agriculture during a difficult time.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Philadelphia Selected for New Urban Agriculture FSA Committee

Philadelphia is among the first cities nationally that will have its own Farm Service Agency committee focusing on urban agriculture.

U.S. Department of Agriculture announced recently the creation of new FSA county committees that will focus exclusively on urban agriculture. Philadelphia was among the first five cities selected for the program.

FSA county committees give farmers an opportunity of help shape delivery of federal farm programs.

"County committees represent farmers and set priorities at the local level," Under Secretary for Farm Production and Conservation Bill Northey said. "Urban and suburban farmers are uniquely qualified to identify the needs of growers and their communities, especially when it comes to making fresh, healthy food accessible."

FSA will begin accepting nominations for the new urban and suburban county committee members Sept. 8.

Urban farmers who participate or cooperate in an FSA program in the county selected may either be nominated or may nominate themselves or others as a candidate. Organizations, including those representing beginning, women, and minority producers, also may nominate candidates.

To be considered, a producer must sign an FSA-669A nomination form. The form and other information about FSA county committee elections are available at fsa.usda.gov/elections or farmers.gov/urban. All nomination forms for the urban and suburban county committees must be postmarked or received in the local FSA office by Oct. 2.

Election ballots will be mailed to eligible voters beginning Oct. 23.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Grants Available for Farm Conservation Projects

Funding is available through the Pennsylvania Department of Environmental Protection's Small Business Advantage Grant program to help farmers purchase energy efficient or pollution prevention equipment, or adopt waste reduction processes.

The program provides 50 percent matching grants, up to a maximum of $7,000.

In addition to projects that decrease energy usage, the grants can be used on best management practices that improve water quality. Examples of eligible projects include, but are not limited to: riparian buffer plantings, streamside exclusionary fencing, barnyard runoff controls, energy efficient lighting, high efficiency heating and cooling equipment, geothermal heat pumps, energy efficient refrigeration, process equipment upgrades, waste recycling systems, solvent recovery systems, and agricultural solar pumps.

Learn more at https://bit.ly/30K7Jcj.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

Reimbursements Available for Conservation Planning in Chesapeake Bay Watershed

The Pennsylvania Department of Environmental Protection will again reimburse farmers in the Chesapeake Bay Watershed for costs associated with developing conservation plans.

The Agricultural Plan Reimbursement Program has $900,000 available to reimburse producers for the cost of hiring technical experts to develop Nutrient and Manure Management and

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NEWS

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Agricultural Erosion and Sediment Control plans. Plans developed after Jan. 1, 2019 are eligible.

More than one plan may be submitted for reimbursement, for up to a maximum of $6,000. Plans must be submitted by May 31 to be eligible for reimbursement.

More information about the program is available at http://bit.ly/2Nranxh.

For additional questions, farmers in Bradford, Cameron, Carbon, Centre, Clearfield, Clinton, Columbia, Elk, Jefferson, Lackawanna, Luzerne, Lycoming, McKean, Montour, Northumberland, Potter, Schuylkill, Snyder, Sullivan, Susquehanna, Union, Tioga, Wayne, and Wyoming Counties should contact Josh Glace of Larson Design Group at jglace@larsondesigngroup.com or 570.374.5700, extension 4011.

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, September 2020.*

Reminder: Apply Now for REAP Credits

Applications are now open for one of Pennsylvania's signature conservation programs, which offers tax credits to agricultural producers who implement on-farm conservation practices.

The Resource Enhancement and Protection Program (better known as REAP) is funded at $10 million dollars this year. Farmers can apply for REAP tax credits to cover 50 to 75 percent of the costs of implementing conservation practices or purchasing related equipment. In high--priority areas, such as the Chesapeake Bay Watershed, credits covering up to 90 percent of costs are available for certain targeted practices, such as 50-foot, forested riparian buffers and measures to exclude livestock from streams.

Common REAP projects include no-till planting and precision ag equipment, waste storage facilities, conservation plans, Nutrient Management Plans, cover crops, riparian buffers and barnyards runoff controls. Credits can be used in conjunction with other funding sources and applications are accepted on a first-come, first-served basis.

Learn more about the program and how to apply at https://bit.ly/30hYrEc.

*From the **Pennsylvania Agricultural Alliance Issues Update**, Penna. Farm Bureau, September 2020.*

CLASSIFIEDS

Businesses and Farms

FOR SALE BY OWNER – PRICE REDUCED GREENHOUSE/GARDEN CENTER OPERATION AT 171 Greenhouse Road (Snyder County), Middleburg, PA 17842. Owners retiring. Proven profitable business model for over 40 years. Turn-key business with records, equipment, inventory, trees, shrubs, retail items. Owner is willing to assist in transition. Creative financing possible. The 18-acre property consists of a two-story, 3-bedroom, 2-bath home with small stream and approximately 60,000 sq. ft. total greenhouse area consisting of aluminum structures with flood tables. A 100 gallon+/minute never-failing well. Additional land to lease.
Call or text Larry at 570-765-6470.
Remember — Classified Ads are FREE for PVGA Members for non-commercial sales.

NEWS

AgBiz Master Registration Open

Are you a young or beginning farmer? Are you interested in honing your business and financial management skills? If you're looking for a hands-on educational program that tackles the questions and challenges you have about managing your agricultural business, AgBiz Masters is your answer. AgBiz Masters recently opened registration for the next class, which begins November 2020 and ends March 2021. The nationally-recognized program helps young and beginning farmers develop skills to ensure the long-term sustainability of their businesses.

AgBiz Masters delivers hands-on business and financial management training to young and beginning farmers. Participants can attend three meetings during the program season to supplement the online learning modules. This year's meeting format may be virtual or in-person, depending on the guidance for COVID-19 at that time.

Topics covered in the program include:

Year One

- Megatrends of Agriculture
- Strategic Business Planning
- Preparing for Your Lender
- Constructing a Balance Sheet
- Constructing an Income Statement and Cash Flow Projection

Year Two

- Understanding Lending Decisions
- Farm Business Management Factors and Benchmarks
- Growth and Transition Management
- Personal Financial Management
- Communications, Ethics and Leadership

The program content is designed specifically for young and beginning farmers. Following are just a few of the comments that summarize the experience:

- AgBiz was helpful in building our understanding and increasing our knowledge of business planning and finance management.
- AgBiz taught me to think of the farm as more of a business not just a job.
- The hands-on exercises and worksheets that were on-farm examples were helpful.
- AgBiz has made me think about areas I was previously not thinking about. The business plan is such a great tool.

A network of agricultural organizations offers AgBiz Masters. To learn more about AgBiz Masters and register online, visit www.AgBizMasters.com. The registration deadline is October 31, 2020. For more information, contact Ashley Mohn at amohn@agchoice.com or 800-349-3568 ext. 6017.

NEWS

Educator's Ag Institute Held Virtually

Like many programs, Educator's Ag Institute, conducted by the Pennsylvania Farm Bureau's PA Friends of Agriculture Foundation, had a different outline when planned this spring. Then coronavirus hit and the format had to change. Thanks to the continued commitment of donors (including PVGA), Educator's Ag Institute happened virtually this summer.

This program, dedicated to generating a greater understanding of agriculture for school teachers, had to adapt to today's socially distanced world. Over the course of four weeks, teachers tuned in for a deep dive into an agricultural topic, earned educational resources and learned new ideas to take back to their classroom. The sessions were hosted in July. The average session attendance was about 70 educators.

A bonus session was offered in August for teachers interested in teaching an agricultural educational series using the Meaningful Watershed Educational Experience or MWEE.

"I learned how to grow plants hydroponically, which will help me teach others and hopefully help to create food security, especially in counties like Fayette that have high food insecurity," Carnegie Library of Pittsburgh educator Kathleen Acklin said. More than 75 educators tuned into the hydroponics session.

Another popular session focused on soils where teachers learned more about soil form, function and how farmers protect this precious resource. USDA Natural Resources Conservation Service Resource Soil Scientist Melissa Hanner demonstrated how to use soil maps on Google to create an interactive experience with their students.

"I liked the technology links," Oxford Area High School teacher Diane Miller said. "It's a good reminder for me to build my skills so I can better teach my students in a meaningful way that will also help them develop important 21st century skills." A virtual session provided teachers the chance to learn more about the Penn State Flower Trials at the Southeast Agricultural Research & Extension Center in Lancaster County. Alyssa Collins, director for the center, took teachers on a virtual tour of the program, highlighting the results of the 2020 trial and how teachers could use the data collected in their classrooms.

The other virtual tour was conducted in partnership with American Dairy Association North East and took teachers on a tour of JoBo Holsteins in Adams County, Pennsylvania. With school field trips in question for the 2020-21 school year, teachers toured the farm to see how this type of program could work in their class plans.

In addition to the tour, educators received additional dairy educational resources and opportunities that could be easily adapted to their classroom for in person or virtual instruction.

"I enjoyed hearing about all of the teaching resources that are available for teachers," St. Katherine School teacher Blake Campbell shared. "I work with students with special needs and I think they would enjoy participating in the 'Adopt A Cow' program."

A virtual program also allowed teachers to learn more about modern agriculture. Pennsylvania Friends of Agriculture Foundation board vice chairman Chris Hoffman shared how he manages his pig farm. 2019 Teacher of the Year Trish Zimmerman demonstrated how she manages a chick hatching program for her eighth-grade students.

"It was great hearing from an actual pig farmer and to be able to see his operation virtually," Mifflin County School District third grade teacher Carrie Stufft said. "I also appreciated the connection to our current economic problems and how it effects (the farmer) and consumers. (It) gave a better picture of what is really happening in Pennsylvania right now." But at the root of it all, teachers enjoy the opportunity to learn from teachers. "I already hatch chicks in my classroom, but it was nice to hear from someone else about their experiences. I hope to use some of the materials to supplement my lessons," Lancaster County Career and Technology Center teacher Lori Hess said.

More than 130 teachers tuned in from across the United States for this year's virtual Institute. In Pennsylvania, 106 teachers participated, with 50 counties reached. The average knowledge gained across all of the sessions was 12 percent.

Pennsylvania teachers were able to earn up to 20 Act 48 educational hours as part of this year's conference at no cost thanks to the support donors like you.

The multiplier effect from this conference will continue as teachers incorporate their knowledge into lesson plans and share the story of agriculture with their students.

NEWS

Another Challenging Pest Has Made Pennsylvania Its Home

John Esslinger

A few weeks back, you were alerted that the Swede midge was found on a Pennsylvania farm. We now warn you about another invasive pest, jumping worms.

Jumping worms are highly destructive to soil quality. Photo: John Esslinger, Penn State

Jumping worms (Amynthas spp., also known as Asian jumping worms, crazy worms, Alabama jumpers, and snake worms) were identified on a farm in Montour County this week.

So, what's the big deal? Jumping worms are highly destructive to soil quality; they grow fast and reproduce quickly, and consume large amounts of organic matter. The plant nutrients in the worm castings are unavailable for a considerable time, and the castings themselves form a dry pellet. Soils tend to dry out quickly as organic matter is depleted, and soil structure degrades, resulting in a soil structure that some have described as resembling coffee grounds. In the forest, they can destroy the mulch layer on the forest floor, making it impossible for many plant species to germinate and establish themselves.

How widespread are these jumping worms in Pennsylvania? We just don't know.

The Montour County growers believe they have been on their farm for at least two years. As you can see from the picture, the adults are about 5 or 6 inches long. They are more active than nightcrawlers. They appear to jerk or jump when disturbed. One characteristic that distinguishes them from a nightcrawler is the clitellum (the narrow band around their middle). The clitellum on the jumping worm is flush with the rest of the body, while on a nightcrawler, it is slightly raised. The clitellum on the jumping worm goes all the way around the body while it does not go around a nightcrawler's underside. It is creamy white to grey on a jumping worm. The jumping worm has only one generation a year. The adults lay their eggs in the soil then die when the ground freezes. The egg cocoons can survive winters worst and hatch out in the spring.

Jumping worms (Amynthas spp., also known as Asian jumping worms, crazy worms, Alabama jumpers, and snake worms) were identified on a farm in Montour County this week.

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Note the clitellum around the middle is flush with the body. On a nightcrawler, this would be slightly raised. Photo: John Esslinger, Penn State

Do they damage crops in ways other than reducing soil quality? It has been documented that they will feed on roots. The Montour County grower had the beet and carrot seedlings eaten off shortly after emergence within the last week. We found an abundance of jumping worms in the area and no other potential pests.

What should you do if you find jumping worms? First and foremost, be careful not to spread them around on your farm or to other farms. They move with soil. Keep in mind that soil can contain eggs even if adults are not present—clean soil from equipment and even shoes before moving to the next field. There are no insecticides labeled to control jumping worms. If found on a small scale, the worms can be collected, destroyed, and disposed of. Do not use them for fishing or in a compost bin. We currently know very little about this pest, but that will change. Keep your eyes and ears open for now.

*Mr. Esslinger is with Penn State Extension in Columbia County. From **Penn State Extension**, https://extension.psu.edu/another-challenging-pest-has-made-pennsylvania-its-home, September 3, 2020.*

LABOR

WPS — The Paper Chase

James Harvey

Often in a Worker Protection Standard (WPS) inspection the only difference between a good inspection and a bad inspection is that the grower did not keep a good paper trail. You can do everything right but if it is not documented correctly you are still in trouble. And when you get in trouble that leads to more paperwork, possible fines and additional inspections.

The government runs on paperwork so growers need to also. In today's high-tech world, you can still do it by pen and paper all the way to voice activated entries on your cell phone and beyond!

The Worker Protection Standard has a number of documents that are required to pass an inspection. These same documents could be very helpful also if an employee ever sued you for safety issues.

Let's review what documentation you need to have in a Worker Protection Standard inspection:

Your central information location:

Pesticide records – you need to have all your pesticide applications for at least the past thirty days available at the central information where employees can see them. These records must have all the required information in them. You then need to keep those pesticide records for at least two years for the WPS and at least three years for Pennsylvania Pesticide Law.

Safety Data Sheets (SDS) – you need the Safety Data Sheets of every pesticide that you use. You can get the Safety Data Sheets from your pesticide dealer or download them off the Internet. Put your Safety Data Sheets in a binder and keep them at the central information location. Be careful that you have the Safety Data Sheets and not the old Material Safety Sheets! The old Material Safety Data Sheets can get you in trouble in an inspection and the newer Safety Data Sheets are easier to find the information that you need.

Your Worker Protection Standard poster or pesticide information poster. These posters changed with the 2015 WPS revision so be sure that you have an up to date poster. Be sure to fill in your state lead agency and hospital information and including your facility address is a good idea too. Don't forget that you also need to mark your permanent decontamination supplies with the posters too!

Training records: All employees working in pesticide treated crop areas must receive Worker Protection Standard training before entering the treated areas. A treated area is where it has been less than thirty days since the last restricted entry interval (REI) expired. Workers must be trained before entering those areas and pesticide Handlers must be trained before working with any pesticides. This training must occur every year! Document this training every time and keep the documents on file for at least two years.

Respirator Training: Handlers who work with pesticides requiring a respirator must go through a 3-part respirator fit test process. Each part needs to be documented and those documents kept on file for at least two years. Part 1 is the medical evaluation to determine if the Handler is healthy enough to wear a respirator. If the Handler is healthy enough to pass they will be given a release by the health care professional and must be kept on file at least two years. However, if the release is good for more than one year we strongly recommend keeping that release form for the number of years that the release is good plus one more year.

Part two of the process is the actual fit test which must occur every year as long as the Handler is working with pesticides requiring respirators. If a professional Fit Testing facility is used they will have their own documentation forms. If it is done in house the Pennsylvania Office of Rural Health can supply the necessary form for Pennsylvania growers.

Part three of the process is respirator training. Once again, the Pennsylvania Office of Rural Health can provide Pennsylvania growers with the appropriate documentation which also has the topics to be covered in the respirator training.

All WPS documentation needs to be kept on file at least two years and possibly longer for state pesticide law. If you are trying to do the smart thing keep the documentation even longer. In a pesticide residue inspection one vegetable grower got caught with high pesticide residues on his vegetables. Since that particular pesticide residue had been off label for over ten years it looked like he was in trouble. The grower had all of his pesticide records for the ten years that he had owned the farm and there was no mention of the off-label pesticide so he was not in trouble. Inspectors assumed that the prior grower dumped his remaining off label pesticide in the area where the suspect pesticide residue was found. So, keep those records longer then required. Lesson two is to utilize your state's CHEMSWEEP program to safely dispose of unwanted pesticides.

Pennsylvania growers can get documentation forms, WPS posters, and many other Worker Protection Standard materials plus answers to questions from Jim Harvey at the Pennsylvania Office of Rural Health at Penn State University. You can e-mail Jim Harvey at jdh18@psu.edu or call him at 814-863-8656. Jim can also do on farm visits to help growers with their WPS compliance efforts.

VEGETABLE PRODUCTION

PA Vegetable Current Issues

Beth Gugino and Shelby Fleischer in consultation with Extension Educators

General conditions and observations as of September 22: September in the Northeast region has been dominated by warmer and drier than normal conditions which has been layered on top of a warmer than normal July and August. In fact the hottest summer on record was recorded in two of the seven climate sites being monitored in Pennsylvania by the Northeast Regional Climate Center. In addition as of 10 Sep 2020, the Department of Environmental Protection expanded its Drought Watch to include 18 counties in PA and declared a drought warning for Potter Co. Over the past several nights, light to moderate frost events across much of the state have signaled that the growing season is approaching an end and that harvest is well under way if not already done for the season.

Field Production Update

Powdery mildew lesions on the upper leaf surface of tomato (Photo: Beth K. Gugino).

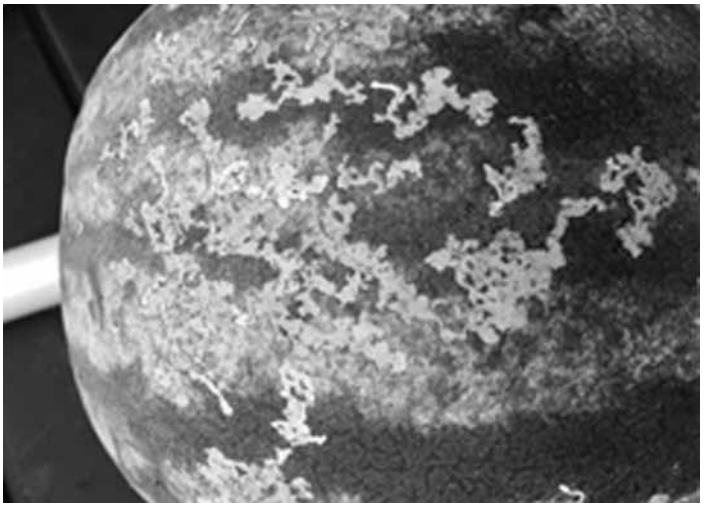
September 22, **late blight** was confirmed in a seven-acre tomato field in Lancaster Co. The field had been maintained with a regular fungicide program so symptoms were not severe, and the foliar lesions had minimal sporulation. Although field production may be winding up, late blight can still develop in high tunnel tomatoes. However, once all the plant tissue is dead so is the pathogen. There have been several reports of **powdery mildew on tomato** in high tunnels. Powdery mildew on tomato looks very similar to that on pumpkin however, it is caused by a different fungal pathogen that is specific to tomato. Powdery mildew could be confused with leaf mold however, lesions from leaf mold will be yellow on the upper leaf surface with dense dark sporulation on the underside of the leaf. Unlike leaf mold that requires very high relative humidity, powdery mildew is favored by mild temperatures and moderate humidity. In fact, very high relative humidity above 95% suppresses disease development.

Harlequin bug, a member of the stink bug family which feeds on cole crops, is typically more of a problem in states to the south of PA but is showing up in large numbers in Lancaster Co. on mustard greens. At this time of year, we also expect to see adults of the fall generation of Allium Leafminer (ALM). In the past several years, when scouting on leeks in Lancaster, adults of the fall generation of ALM first appeared anywhere from the last week of September to the last week of November. These are adults emerging from pupae that have aestivated, which is like a hibernation state through the summer. Scout fall allium crops for the oviposition marks. Weekly sprays during the adult flight period – as measured by presence of new oviposition marks - has controlled ALM on fall leeks. Effective foliar materials that have been the most consistent include dinotefuran, cyantraniliprole and spinetoram. Control has also been achieved with foliar sprays

Left: Harlequin bug feeding on mustard greens (Photo: Debra Deis, Seedway). Right: Oviposition marks of Allium Leafminer (Photo: B. Lingbeek).

of abamectin, acetamiprid, cyromazine, imidacloprid, lambda-cyhalothrin, methomyl and spinosad. A surfactant is recommended whenever applying foliar sprays on alliums due to their waxy coating on the leaves.

In sweet corn harvest evaluations at Rock Springs, GE cultivars that express the VIP (vegetative insecticidal protein), such as Remedy, or others in the Attribute II series, once again gave excellent (100%) control of **corn earworm**, whereas cultivars with various Cry (CrylAb, CryII, etc.) failed (control was only 40% or less).



Rind feeding on watermelon, probably from striped cucumber beetle (Photo: Insect ID lab).

Spider mites and **thrips** continue to be a problem, and **aphids** are showing up in multiple crops. **Tomato spotted wilt virus**, which is vectored by **Western Flower Thrips**, caused field scale damage in peppers in western PA, and tomatoes in New

Vegetable Disease Updates

Beth Gugino

As of September 16, there have been no new reports of late blight in our region. The closest new report was two days ago in western North Carolina on potato. Even though it is late in the season, if you suspect late blight on your farm please let me know either by email at bkgugino@psu.edu, by phone at 814-865-7328 or contact your local Extension Office. We are still interested in collecting samples for genotyping.

This past week there have been fewer reports of cucurbit downy mildew across the eastern US likely due to the season starting to wind down. Disk under crops that are no longer being harvested to facilitate the decomposition of crop residue. Similar to late blight, once the plant tissue is dead, so is the pathogen. Cucurbit downy mildew does not overwinter in our soils. We are still interested in reports so if you suspect that you may have downy mildew, please let me know by email at bkgugino@psu.edu or by phone at 814-865-7328 or contact your local Extension Office.

Severe powdery mildew in a pumpkin field planted with a susceptible cultivar and not treated with any fungicides. Photo credit: Beth K. Gugino.

To spray or not to spray for powdery mildew on pumpkins is the question everyone is asking as pumpkin harvest begins. The closer you are to harvest, more emphasis can be placed on targeting fungicides towards protecting the handles rather than the leaves. It is recommended that you drop back to using a protectant-based program under severe powdery mildew disease pressure to help reduce the potential development of fungicide resistance by not exposing the severely infected leaves to powdery mildew targeted fungicides. Targeting the handles with protectant fungicides should be a little easier as the plant canopy begins to thin this time of the season depending on powdery mildew severity and overall crop maturity.

In regions of the state which had more significant rainfall, there have been reports of bacterial canker on tomato. If it was a problem on your farm this year, now is the time to reflect on the production season while it is fresh in your mind and identify points in the crop production cycle where disease management could be improved. Managing for bacterial diseases starts with the seed and ends post-harvest – it is a season-long approach. As you clean up from this season remember that wooden stakes can harbor the bacteria even when exposed to freezing temperatures overwinter. Therefore, stakes from symptomatic fields should not be used again the production of solanaceous crops like tomato and pepper. Stakes from asymptomatic fields should be sanitized before use again either by power washing and soaking in a sanitizing solution like sodium hypochlorite, Oxidate, Zerotol, etc.

Marginal necrosis characteristic of bacterial canker on tomato. Photo credit: Beth K. Gugino.

or subjecting them to high temperatures through kiln drying or steaming. Bacteria are more susceptible to hot rather than cold temperatures. Also, this winter when planning crop rotations, allow 3 to 4 years between tomato/pepper crop to facilitation the decomposition of crop residue. These couple of recommendations along with strict sanitation practices in the greenhouse and field can help with reducing potential losses in the future.

This fall as the temperature drops, dew periods extend, and the skies remain cloudy on the lookout for Botrytis gray mold (and late blight) in high tunnel tomatoes. Although high tunnels provide direct protection from rain, high relative humidity and dew can still provide the moisture necessary for disease development.

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Irregular zonate lesions characteristic of Botrytis gray mold. Dense gray sporulation can often be seen on all symptomatic surfaces under very humid conditions. Photo credit: Beth K. Gugino.

VEGETABLE PRODUCTION

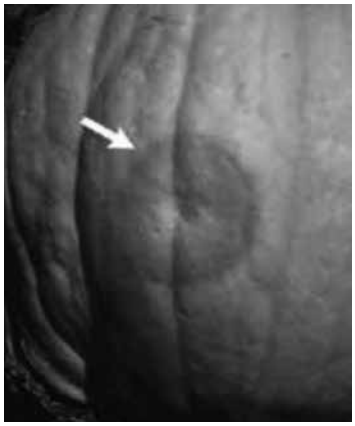
Fruit Rots of Pumpkins and Winter Squash

M. Bess Dicklow

Many types of pathogens—fungi, bacteria, and viruses—can cause fruit rots, spots, and other abnormalities in pumpkins and winter squash that render them unmarketable. The most common rots, which happen to be caused by fungi, will be discussed below. Other less common fruit rots include bacterial leaf spot (*Xanthomonas campestris pv. cucurbitae*) and angular leaf spot (*Pseudomonas syringae pv. lachrymans*), both caused by bacteria, and other fungal diseases such as Alternaria rot (*Alternaria alternata*), blue mold (*Penicillium* spp.), crater rot (Myrothecium roridum), cottony leak (*Pythium* spp.), and Rhizopus soft rot (*Rhizopus stolonifera*). Viral diseases usually cause distortions of fruit and/or discolorations or ring-spots rather than fruit spots and rotting. Most of these fruit-rotting pathogens also affect the foliage; therefore controlling the disease on the leaves can reduce the amount of inoculum present to infect fruit later in the season. For descriptions of foliar symptoms and tips for managing these diseases on foliage see the July 3, 2019 issue of Veg Notes, and for chemical recommendations see the pumpkin and squash disease section of the New England Vegetable Management Guide.

Phytophthora Blight (*Phytophthora capsici*, an oomycete pathogen): This is perhaps the most serious fruit rot of pumpkins and winter squash in wet years. Infection with *P. capsici* begins as a water-soaked or depressed spot, most often occurring where the fruit contacts the soil, since the pathogen comes from the soil. As the rot develops, a mass of powdery white sporangia will develop in the water-soaked spot and will continue to spread, eventually covering the entire fruit. The pathogen survives in the soil for many years—the exact duration is not known, but a reasonable estimate is 8-10 4 years. Disease can develop and spread rapidly when soil moisture is high and temperatures are between 80-90°F. Entire fields may be destroyed very quickly.

Tips for Managing Phytophthora Blight: Manage soil moisture by sub-soiling, avoiding over-irrigating, selecting well-drained fields, and avoiding areas of fields that do not drain well. Destroying diseased areas at the start of an outbreak can be effective in slowing the spread of disease, taking care to thoroughly clean equipment afterward to avoid spreading the pathogen to other parts of your farm. Planting pumpkins into cover crop mulch (e.g. no-till) or following the biofumigant cover crop 'Caliente' mustard has been shown to reduce severity of outbreaks in research trials. Pumpkins with hard, gourd-like rinds are less susceptible to Phytophthora blight: 'Lil' Ironsides', 'Apprentice,' 'IronMan,' 'Rockafellow,' and 'CannonBall' have been reported as moderately-resistant, and 'IronMan,' 'CannonBall,' and 'Rockafellow' also have resistance to powdery mildew. Newer oomycete-specific fungicides can be effective in reducing severity of Phytophthora blight in squash and other hosts such as peppers and tomatoes.



Early Phytophthora lesion (top, Photo: M.T. McGrath) and more advanced rot, showing sporulation (above, Photo: T.A. Zitter).

Fusarium Fruit Rot (*Fusarium solani* f.sp. *cucurbitae*): Fusarium is another soil-borne pathogen that attacks squash and pumpkin fruits at the soil line. Surfaces of fruit that are in contact with the soil develop tan to brown, firm, dry, sunken lesions which may occur in concentric rings. These lesions will remain firm unless invaded by secondary fungi or bacteria. Severity of infection varies with soil moisture and the age of the rind when infection occurs. Fusarium can survive in seed but does not affect the germination or viability of the seed. Fusarium produces abundant overwintering structures (chlamydospores) that survive in the soil, but these only persist for 2-3 years. Cultivars vary in their resistance, with larger pumpkins generally being more susceptible.

Fusarium on pumpkin. Photos: T.A. Zitter

Black Rot (*Didymella bryoniae*): This pathogen can also infect pumpkin and squash foliage and stems; it is called black rot when it infects fruit, and gummy stem blight when it infects other plant parts. On fruit, this pathogen produces a distinctive black decay. Initially, a brown to pink, water-soaked area develops, in which numerous, black fruiting bodies (pycnidia) are embedded. Black rot on butternut may appear as a superficial, hardened, tan to white area which can develop concentric rings. Large Halloween pumpkins are more susceptible to black rot than smaller pie types. The pathogen is soil- and seed-borne and can overwinter in infected crop debris as dormant mycelium or chlamydospores. Wounding is not required for disease initiation, but wounding by striped cucumber beetles, aphid feeding, and powdery mildew infection all lead to increased susceptibility.

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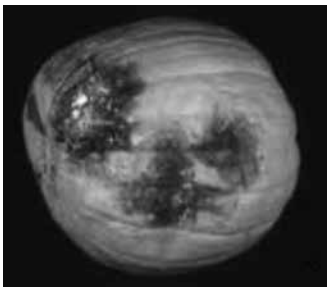
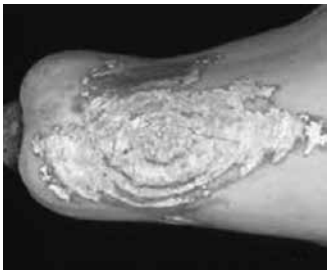




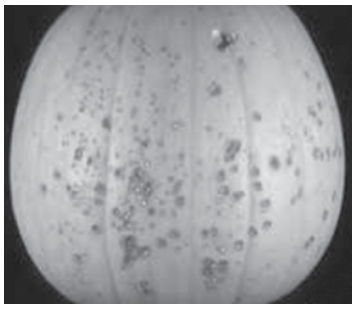
Clockwise from top left: Black rot symptoms on pumpkin. Black rot fruiting bodies(pycnidia) within a lesion. Symptoms on butternut squash. Photos:T.A. Zitter

Fruit Rots of Pumpkins and Winter Squash *continued from page 14*

Anthracnose (*Colletotrichum orbiculare*): Cucurbit anthracnose is common on the fruit and foliage of watermelons, squash, melons, and cucumbers in humid environmental conditions. Young fruit may turn black and die if their pedicels are infected, while older fruit develop circular, noticeably sunken, dark-green to black lesions which may produce a salmon-colored exudate under moist conditions. In addition to the lesions, infected fruit may have a bitter or off-taste. Infected fruits can deteriorate quickly due to the invasion of secondary rot organisms. *C. orbiculare* can be seed-borne and also survives between crops in infected crop debris, volunteer plants, and weeds in the cucurbit family and is spread by splashing water, workers, and tools in warm, humid weather.

Scab (*Cladosporium cucumerinum*): Scab can affect all parts of cucurbit plants, but is a concern primarily because of the disfiguring scabby lesions that develop on fruit. The disease is favored by heavy fog, heavy dews, or light rains, and temperatures at or below 70˚F. The spores are produced in long chains and are easily dislodged and spread long distances by wind. On foliage, the first sign of the disease is pale-green, water-soaked lesions which turn gray and become angular as they are contained by leaf veins. On fruit, spots first appear as small sunken areas which can be mistaken for insect injury. The spots may ooze a sticky liquid and become crater-like as they darken with age. Dark green, velvety layers of spores may appear in the cavities and secondary soft-rotting bacteria can invade. Severity of symptoms varies with the age of the fruit when it becomes infected. C. cucumerinum overwinters in infected crop debris and soil, and may also be seed-borne. Spores produced in the spring can infect in as little as 9 hours, produce spots within 3 days, and produce a new crop of spores within 4 days.

Sunken lesions on kabocha squash, caused by anthracnose. Photo: K. Campbell-Nelson



Scab on pumpkin. Photo: T.A. Zitter

Plectosporium Blight (*Plectosporium tabacinum*): Plectosporium blight affects many plant parts but is most damaging when it affects cucurbit fruit. Pumpkins, yellow squash, and zucchini are the most susceptible. Lens to diamond shaped, white to tan, lesions occur on stems, leaf veins, petioles, and peduncles, while fruit lesions are more rounded. Severe stem and petiole infections cause leaves to become brittle and can result in death of leaves and defoliation. On fruit, the pathogen causes white,

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VEGETABLE PRODUCTION

Fruit Rots of Pumpkins and Winter Squash *continued from page 15*

tan, or silvery russeting; individual lesions can coalesce to form a continuous scabby layer. Plectosporium blight is favored by wet weather; in wet years, crop losses in no-spray and low-spray fields can range from 50 to 100%. No resistant cultivar of pumpkins has been reported and it is not known to be seed-borne.

Plectosporium on pumpkin. Photo: T.A. Zitter

Management of Fungal Fruit Rots:

- Start with disease-free seed or use fungicide-treated seed.
- Do not save your own seed if disease is present in the field.
- Select well-drained fields with good air circulation to promote rapid drying of foliage and fruit.
- Rotate out of cucurbits for 2 or more years.
- Fungicide sprays can reduce diseases which start in the foliage and then splash on the fruit e.g. Plectosporium, scab, anthracnose.
- Spraying copper can reduce infection of fruit by the foliar diseases angular leaf spot and bacterial leaf spot.
- Destroy and plow crop residues promptly after harvest to prevent their spreading and hasten their breakdown in the soil.
- Controlling powdery mildew can significantly reduce black rot infection of pumpkins.
- Avoid chilling injury to winter squash and pumpkins in storage, as this can allow for spread of some diseases in storage. Store fruit at 50-55°F and ~60% relative humidity.

Ms. Dicklow was with the Univ. of Massachusetts Plant Diagnostic Lab and is now retired. From the ***Vegetable Notes for Vegetable Farmers in Massachusetts****, Univ. of Mass. Extension, Vol. 32, No. 24, September 3, 2020.*

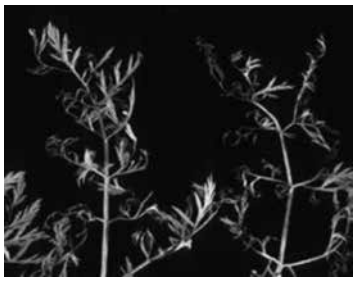
Identifying Diseases of Carrots

Susan Scheufele

Carrots are becoming a more important crop for many growers, as folks look to increase winter sales in expanding yearround markets. Carrots can be affected by many bacteria, fungi and nematodes in the field and also while in storage. Foliar diseases may cause lower yields due to loss of photosynthetic ability, difficulty in harvest if the tops are weakened, and lower marketability if the carrots cannot be sold in bunches. Root diseases can lower yields of fresh eating carrots and can spread in storage, drastically reducing yields sold through later markets. Root diseases are caused by soil-dwelling organisms and therefore their incidence may vary considerably from farm to farm or even from one side of the field to the other. Proper disease identification will help you to prevent future outbreaks by adjusting crop rotations accordingly, and prevent moving infested soil from field to field. Some of the major carrot disease symptoms are described below. If you are noticing foliar or root symptoms like those described, send a sample to your state diagnostic lab to confirm, and take steps to protect current and future crops. See the Penn State Disease Clinc website at https://plantpath.psu.edu/about/facilities/plant-disease-clinic or call 814-865-2204 for their sample submission instructions.

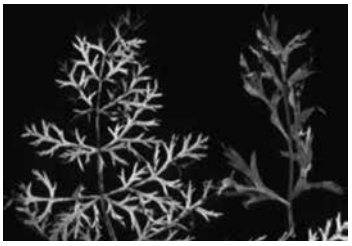
Foliar Diseases

Alternaria Leaf Blight (*Alternaria dauci* and *A. radicina*) symptoms first appear along leaflet margins as greenish-brown, water-soaked lesions which enlarge, turn brown to black, and often develop a yellow halo. Older leaves are more susceptible to infection. When about 40% of the leaf is infected, the leaf yellows, collapses, and dies. Lesions on petioles are also common and can quickly kill entire leaves. *A. radicina* can also produce a dry, mealy, black decay known as black rot on carrot roots held in storage.



Alternaria leaf blight. Photo: R. L. Wick

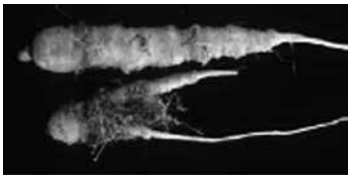
Bacterial Leaf Blight (*Xanthomonas campestris* pv. *carotae*) symptoms appear primarily on leaf margins as small, yellow, angular leaf spots which expand, turn brown to black with a yellow halo, and become dry and brittle. Leaflets may become distorted and curled. Symptoms can extend into petioles where they produce a yellow-brown, gummy exudate, and may also occur on flower stalks. Infected umbels can be completely blighted and seed infection can occur—use treated seed to prevent introducing this disease.



Bacterial leaf blight. Photo: R. L. Wick

Root Diseases

Root Knot Nematode (*Meloidagyne hapla*) forms galls or root thickenings of various sizes and shapes. Growth of infected carrots is patchy and uneven and severely infected carrots exhibit forking, galls, excessive hairiness, and stubby roots. Where soil populations of M. hapla are high, symptoms include stunted plants, uneven stands, premature leaf death, and branches and swellings on both lateral and tap roots. Marketable yield is reduced by deformities, size reduction, branches, and knobs. M. hapla persists in the soil and has a very wide host range so rotation can be difficult, but grasses are non-hosts so small grains and corn and bean can be grown in rotations to reduce the size of the population.



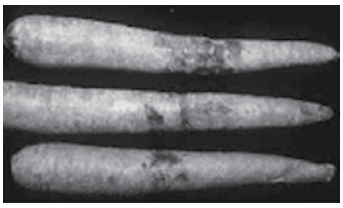
Root knot nematode. Photo: R. L. Wick

Black Root Rot (*Thielaviopsis basicola*) occurs primarily in storage when conditions are not ideal and temperature and humidity are too high. The fungus causes superficial,

Continued on page 17

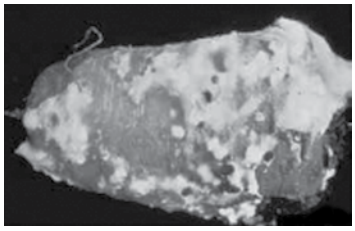
Identifying Diseases of Carrots *continued from page 16*

irregular black lesions which occur in a random pattern. The discoloration, caused by masses of dark brown to black chlamydospores, is limited to the skin. The pathogen rapidly invades wounded tissue and is favored by long post-harvest periods without cooling, so careful harvest and immediate cooling (< 41°F) and storage can minimize disease impact.



Black root rot. Photo: R. L. Wick

White Mold (*Sclerotinia sclerotiorum*) affects many vegetable crops but carrots are particularly susceptible, especially late in the season and during storage. The fungus may be present in soil, storage areas, or containers. Symptoms include characteristic white mycelial growth and hard, black sclerotia (long-term survival structures), which may be seen on the crown of infected carrots. In storage, the disease is characterized by a soft, watery rot with fluffy white mycelia and black sclerotia present. Sclerotia can persist in soil for many years and the fungus has a very wide host range, making this disease difficult to manage. Grasses and onions are non-hosts that can be used in rotations, and a commercially available biocontrol product, Contans, has been shown to be effective in parasitizing overwintering sclerotia. Contans should be incorporated into infested soils in the fall to give the biocontrol fungus time to infect the sclerotia.



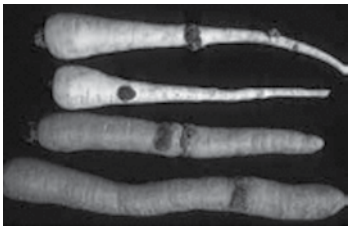
White mold. Photo: W. Brown

Cavity Spot and Root Dieback (*Pythium* spp.). Infections from *Pythium* spp. can occur during early root development and are favored by moist soil conditions. Root dieback symptoms appear as rusty-brown lateral root formation, or forking and stunting; symptoms that can be easily confused with damage from nematodes, soil compaction or soil drainage problems. Cavity spot often shows up later in the season near harvest. Horizontal, sunken lesions varying in size from 1 to 10 mm appear on the surface of the root and can provide an ingress for secondary fungal or bacterial infections.

Cavity spot. Photo: S. Livingston

Crown Rot (*Rhizoctonia carotae*). Early symptoms are horizontal dark brown lesions around the root crown. As the crop matures the tops may die in patches in the field and as the disease progresses lesions join to form large, deep, rotten areas on the crown of the root. R. carotae can also cause crater rot and violet root rot, but these diseases are less common in Massachusetts. Crown rot is favored by moist conditions, so planting on raised beds and/or in well-drained fields can minimize disease incidence.

Scab (*Streptomyces* spp.) can cause both raised and sunken, dry, corky lesions on the carrot root. This disease is less common and when it does occur symptoms are rarely severe enough to cause major losses in yield or marketability. Avoid planting carrots in alkaline soils, which are known to favor the incidence of scab, or in potato fields with high incidence of scab, as the disease can be caused by the same organism in carrots.



Scab. Photo: R. L. Wick

Bacterial Soft Rot (*Pectobacterium carotovorum* subsp. *carotovorum*) is a common disease in storage where it infects roots that previously wounded or diseased. It occurs in the field only rarely, under extremely wet soil conditions. Symptoms start as small water-soaked lesions that quickly spread and cause affected areas to become mushy, though the skin may remain intact over the liquefied flesh underneath. To avoid problems in storage, avoid wounding carrots during harvest and washing and maintain proper storage conditions.

To avoid losses in storage, try to achieve optimum storage conditions of 32 to 34°F (essential to minimize decay and sprouting during storage) and high relative humidity (required to prevent desiccation and loss of crispness). Mature topped carrots can be stored for 7 to 9 months at 32°F with 98 to 100% RH. Those ideal conditions are difficult to achieve and topped carrots are often successfully stored for 5 to 6 months at 32 to 41°F with 90 to 95% RH. Prompt cooling of harvested carrots (< 41°F) also helps maintain crispiness. Carrots produce very little ethylene (a byproduct of respiration) themselves but are sensitive to ethylene produced by other crops in storage and exposure causes production of the bitter compound isocoumarin, which is greatest in the peel—peeled carrots are not affected. Unless outside temperatures are very low or very high, ventilation is an inexpensive method of reducing ethylene levels. Ethylene can also be absorbed on commercially available potassium permanganate pellets.

Ms. Scheufele is with the Univ. of Massachusetts Extension Vegetable Program. *From* ***Vegetable Notes for Vegetable Farmers in Mass.****, Univ. of Mass., Vol. 32, No. 25, Sept. 17, 2020.*

VEGETABLE PRODUCTION

Postharvest Handling and Storage Basics

Chris Callahan

Harvested vegetables are living things that carry on the process of respiration and other biological and chemical processes even after they have been picked. How produce is handled after harvest will directly affect quality characteristics such as appearance, flavor, texture, and nutritional value. Attention to postharvest quality can increase repeat sales and support higher prices. Control of postharvest quality essentially comes down to limiting respiration rate (lowering temperature), controlling water loss (maintaining proper relative humidity), minimizing physical damage to the product (harvesting and handling with care), and avoiding contamination (handling, washing, and storing appropriately).

Winter squash binned up for storage. Photo: UMass Veg Program

Limiting Respiration. Respiration is a temperature-dependent biochemical process that converts carbon (mainly sugars) in plant tissue to carbon dioxide (CO_2) and water (H_2O) while producing some heat. Rates of respiration vary by the crop (see Gross 2016 Table p. 7 and pp. 68-75), and should be taken into account when sizing cooling equipment. Fortunately, we can significantly reduce respiration, and therefore maintain high product quality, by reducing product temperature (precooling) and keeping it low (holding or storage cooling). This concept is known as establishing the "cold chain"—a chain of reduced temperature that connects the field to the consumer, ensuring the highest quality produce possible by minimizing respiration.

From the moment of harvest, product quality will deteriorate. Intentional pre-cooling of produce directly after harvest helps quickly reduce the rate of respiration and initiates the cold chain. Examples of precooling include scheduling harvest activities at cooler times of day, shading harvested product in the field prior to transport, forced air cooling through the packed product with refrigeration, hydrocooling with cool water, and vacuum cooling via evaporation. Once cooled to storage temperature, reliable, refrigerated storage is necessary to maintain high quality.

It is important to note that not all crops can be cooled to the same temperature without resulting in cold or freeze injury and some crops are sensitive to the method of cooling. Crops have different susceptibility to chilling or freeze injury Winter squash binned up for storage. Photo: UMass Veg Program 7 depending on their physiology. Good guidance is available (see Gross 2016, pp. 62-67) and is summarized in Table 16 of the New England Vegetable Management Guide. Common precooling methods are also noted in Table 16. Additionally, a computer-based crop storage planner is available for determining appropriate grouping of your crops and estimating overall respiration load (see Callahan 2016). Chilling injury is also an important consideration when considering particularly sensitive fall-harvested crops, e.g. winter squash, and the possibility of lower nighttime temperatures. Notes on chilling injury guidance for these crops are provided in the appropriate crop chapter of the NE Vegetable Management Guide and in the references noted above.

Controlling Water Loss. The control of water loss requires careful attention to the relative humidity (RH) of the air surrounding stored product in addition to temperature. RH is a measure of the amount of water vapor in air compared to the maximum amount that can be saturated in that air at a given temperature. Most, but not all, crops are ideally stored at higher RH to prevent water evaporation into the air leading to water loss. The loss of water reduces the weight of the crop and also can lead to lower quality and poor appearance.

Some crops, such as onions, garlic and winter squash, are purposefully "cured" or dried resulting in drier outer skin and cured harvest wounds to allow for long term storage. Because this results in a paper-like layer, these crops are generally stored at lower RH to prevent development of postharvest disease such as molds and fungi on this outer skin. Other than these examples, most crops are best stored at 90-95% RH with specific guidance provided in Table 16, in the crop storage planner noted above, and in the literature (see Gross 2016).

Minimizing Physical Damage. Generally speaking, produce crops live a very gentle life until harvested. Starting with harvest, produce is moved and handled for the first time and, typically, many times after. With each movement there is a risk of physical damage. Even if the damage is not obvious, it can result in bruising or other damage that becomes evident later and can lead to postharvest disease and infiltration by pathogens, which are encouraged by damaged cell tissue. Even during harvest, crops can suffer "harvester blight." For the majority of crops, gentle handling, crates with smooth and clean surfaces, and conveyance with elastic and soft belts and rollers is recommended.

Avoiding Contamination. Sorting and culling are also important practices at this stage. As the saying goes, "one bad apple can ruin the bunch". Sorting allows for different sizes and grades of product to be stored and sold separately, and culling can separate damaged or lower quality product from the main lot for sale, rescue donation or compost depending on the defect. The removal of obviously damaged product from the lot helps minimize cross contamination with postharvest pathogens to a larger portion of the population.

Produce can be rinsed to remove soil and debris, and often a sanitizer is added to the rinse water to prevent cross-contamination of plant and human pathogens from one item of produce to another in the same batch (see the following references: LaBorde, Samuels, and Stivers 2016, Bihn et al. 2014).

Once packed and ready for storage or transport, care should be taken to avoid contamination of product with other contaminants such as foreign matter and unintentional water such as condensate from refrigeration systems.

References

Gross, Kenneth C., Chien Yi Wang, and Mikal Saltveit, eds. 2016. The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks. Agriculture Handbook 66, U.S. Department of Agriculture, Agricultural Research Service, Washington, DC. https://www.ars.usda.gov/ARSUserFiles/oc/np/CommercialStorage/CommercialStorage.pdf.

Callahan, Christopher W. 2016. Crop Storage Planning Tool. UVM Extension. http://blog.uvm.edu/cwcallah/2016/01/21/new-crop-storage-planning-tool/.

Bihn, E., Schermann, M. A., Wszelaki, A. L., Wall, G. L., and Amundson, S. K. 2014. On-Farm Decision Tree Project: Postharvest Water. National Good Agricultural Practices Program. https://gaps.cornell.edu/educational-materials/ decision-trees/postharvest-water.

LaBorde, L., Samuels, R. and Stivers, L. 2016. Video Series: Using Sanitizers in Washwater. https://extension.psu.edu/ using-sanitizers-in-wash-water-part-1-reasons-for-washing-fresh-produce.

Mr. Callahan is an Agricultural Engineer with the Univ. of Vermont Extension. *Excerpted from 2018-2019 New England Vegetable Management Guide. From* ***Vegetable Notes for Vegetable Farmers in Mass.****, Univ. of Mass., Vol. 32, No. 24, Sept. 3, 2020.*

VEGETABLE PRODUCTION

When to Stop Spraying

Dan Egel

Many vegetable growers are closing in on the final harvest. Several growers have asked me about fungicide applications late in the season. In this article, I want to address when to stop. To limit the scope of this article, I will concentrate on tomato, cantaloupe and watermelon crops. These are crops where the fruit is consumed, not the foliage.

For most vegetable crops, there is no need to apply a fungicide shortly before the final harvest. Foliage needs to be protected to preserve fruit quality. A plant with reduced foliage will produce a smaller fruit and/or fruit that have fewer sugars and other desirable compounds. I don't know how much foliage needs to be reduced to affect fruit size or quality. However, I do know that for many foliar diseases, symptoms will not be obvious for a week to 10 days. It will take even longer for the foliar disease to significantly reduce foliage. Therefore, for many diseases, it doesn't make much sense to spend good money for a fungicide on a crop that is 2 to 3 weeks before the final harvest.

Examples of diseases that affect foliage, but not fruit directly include: powdery mildew of cantaloupe or tomato, early blight of tomato, Septoria leaf blight of tomato, gummy stem blight of watermelon or cantaloupe, Alternaria leaf blight of cantaloupe and downy mildew of cucurbits. With some rare exceptions, these diseases reduce yield or fruit quality by affecting foliage, not by attacking fruit directly. Alternaria leaf blight of cantaloupe and downy mildew of cucurbits affect leaves only—not even the stems.

Diseases that affect fruit directly may need fungicide applications closer to harvest. A disease that can cause a lesion directly on a fruit can ruin the marketability of the fruit or even cause the fruit to begin to rot in transit. However, most fungicides will remain active in or on the plant for 6 to 7 days even during the most conducive weather. Therefore, an application of a fungicide to protect fruit from direct infection from disease is probably not necessary within 7 days of the final harvest.

Examples of diseases that may affect fruit directly include:

• Anthracnose of watermelon: This disease can cause loss of foliage, but also lesions on the fruit. An infection on the day before harvest could, theoretically, cause a lesion in transit. During weather that is conducive to disease, it makes sense to keep a fungicide on the plant surfaces during the last several days before harvest. Growers that are using the MELCAST system will be able better judge when the weather is conducive for anthracnose.

• Phytophthora blight: This disease affects foliage as well as fruit. As with anthracnose above, a lesion that develops before harvest could start to rot the fruit in transit. Specialized fungicides applied 7 to 10 days before final harvest should protect the fruit.

• Bacterial spot or speck of tomato: Lesions of these diseases that occur on the fruit can ruin marketability. Applications of a copper product should help to protect the fruit during the last week or so. Warm, wet weather shortens the disease cycle and increases the likelihood of infection.

• Bacterial spot of pumpkin: This disease can cause pimple-like lesions that may ruin marketability. However, the disease affects fruit during the first 14 days or so after pollination. After this period, infection is much less likely due to changes in fruit maturity. Therefore, copper applications during the last weeks before harvest make little sense.

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VEGETABLE PRODUCTION

It is a Good Time to Check Vegetables for Root Knot Nematode

Jerry Brust

As this growing season winds down, and for the next few weeks, it is a good time to examine vegetable roots for root knot nematode (RKN). I would be suspicious of having RKN if my vegetables seemed to need more water than normal or wilted during the heat of the day and recovered later or plants had nutrient deficiency symptoms rarely seen in your fields and the addition of fertilizers did not seem to alleviate the deficiency symptoms. Other symptoms to be suspicious of include plants in some areas appearing stunted with either lower yields or poorer fruit quality. If these vegetable problems were noticed in spots in the field that seemed to follow down a row year after year, there is a chance you have RKN and you should check your vegetable roots for galls.

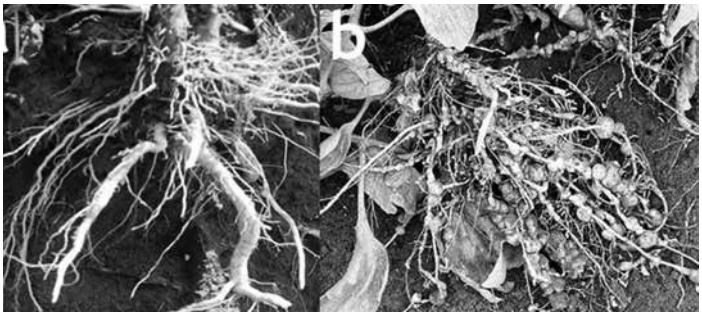

Figure 1. Tomato roots without (a) and with galls (b) from root knot nematode infection

When you are done harvesting your field dig—do not pull up– your plants that are having problems and some of the plants that border these problematic plants. If the ground is moist when you dig it makes the whole process much easier. Wash the roots with water or dip plant roots into a barrel of water and gently swish the roots around. Inspect the roots of the plants for the tell-tale symptoms of RKN, i.e., galls on the fine and larger roots of a plant (Fig. 1b) vs uninfected roots being smooth and thin (Fig. 1a). At other times entire roots can become swollen and appear 'lumpy' and rotted with other roots being much thinner (Fig. 2).

Figure 2. Lumpy rotted roots of a cucumber plant caused by RKN infection

Root-knot nematodes start out as eggs that develop into J1 or first-stage juveniles, when J1s molt they become J2 nematodes. The J2 stage is mobile and is the only stage that can start infections. They attack the root tips and enter roots behind the root cap where they initiate a feeding site by injecting secretions that cause the cells to greatly enlarge. The male RKNs eventually leave the roots, but the females stay in the root and lay their eggs in a jelly-like mass that reaches into the soil.

Soil fumigants or nematicides can be effective in reducing RKN damage to vegetable roots, but they will not eliminate the pest from the soil and populations will still be high at the end of the season, but roots will be protected long enough for a crop to be produced. More information on fumigants and nematicides can be found in the 2020-2021 Mid-Atlantic Commercial Vegetable Production Recommendations guide.

There are other options that can be used to reduce RKN populations. One of these options is using certain cover crops that can decrease RKN severity and crop damage. Rapeseed (relative of canola) is one of these cover crops that is planted in late September early October in Maryland at 800,000-900,000 seeds per acre and letting it grow throughout the fall, winter and early spring and then tilling it under in mid-March through mid-April. Rapeseed crops have a high sulfur requirement, so be sure you have adequate levels of sulfur in your soils for this cover crop. The key is getting a good solid stand of the cover crop so that weeds do not grow along with the crop as many weed species can act as hosts for RKN.

In the summer a good cover crop to use is sorghum-sudangrass that can be planted following an early season vegetable crop such as cucumber, pea or snap bean. Planting seed at 200,000 seeds/a or 20 lbs/a in mid to late July produces enough biomass to reduce RKN populations. For best control, the sorghum-sudangrass crop should be chopped while green into smaller pieces and incorporated into the soil by mid-October. Well incorporated sorghum-sudangrass can be as effective as fumigation. Adding poultry litter or poultry litter compost into the sorghum-sudangrass biomass produces the most effective reduction in nematodes.

Dr. Brust is the , IPM Vegetable Specialist at the Univ. of Maryland
*From **Weekly Crop Update**, Univ. of Delaware Extension, Vol. 28, Issue 27, September 18, 20202*

Vegetable Disease Updates

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Gray mold affects many different types of vegetables and ornamentals so there are many potential sources of this pathogen. It easily grows on weakened or senescing (dying) plant tissue such as old flower blossoms or leaf litter however, it can still cause lesions on the leaves and stems. Foliar lesions can be confused for late blight since both are irregular in shape however gray mold will develop more of a concentric ring pattern and the fuzzy growth (sporulation) is darker and grayer in color and can develop on both the upper and lower leaf surface as well as the surface of stem lesions. Stems can become girdled and break and foliar symptoms can become severe enough to cause defoliation. The fruit can become infected from dying flower petals that hang on as the fruit develop. These lesions are whitish in color, very soft and watery and typically develop near the stem end. This is in complete contrast to late blight that causes dark-brown greasy firm lesions on the fruit.

For gray mold, general sanitation is important since it is a very good saprophyte. Also maximizing and maintaining good air circulation through cultural practices. Disease development is favored by temperatures from 64 to 75°F and typically develops on more mature plants that have dense canopies. Foliar applications of products such as Scala (FRAC code 9, 1-day PHI), Botran (FRAC code 14, 0-day PHI), and Fontelis (FRAC code 7, 0-day PHI) will help manage the disease and are labeled for use in greenhouse (and high tunnel) tomato production.

*Dr. Gugino is with the Department of Plant Pathology and Environmental Microbiology at Penn State Univ. From **Penn State Extension**, https://extension.psu.edu/pennsylvania-vegetable-disease-update-for-september-17-2020, September 17, 2020.*

Vegetable Insects to be Watching For

David Owens

Cole Crops: Continue scouting all cole crops. All cabbage pests are active, including some oddballs such as beet armyworm and the webworm complex, particularly in fields with a lot of pigweed. Cabbage looper is very active. Recent heavy rains should help suppress diamondback moth, however their populations were ticking upwards. Thresholds for early stage plants prior to cupping or head formation are 20% infested plants. Remember to rotate modes of action from one spray to another and to rotate modes of action out every 30 days. Good coverage is essential, and in many cases, use of an adjuvant will help improve control on the waxy leaves. Do not use binder or sticker adjuvants when using diamides or Radiant, these products try to get across the leaf membrane into the tissue, while stickers try to keep the product on the surface.

Harlequin bugs have also been unusually active, especially in locales where cole crops were either present throughout the summer or an earlier crop was left in the field instead of removed. Harlequin bugs are tanks, the only products that do a good job on them are pyrethroids and neonicotinoids. The neonics by themselves have poor efficacy on worm pests. Pyrethroids generally do a great job at controlling imported cabbageworm and cabbage looper, but diamondback moth, beet armyworm and corn earworm, if present, can be much more difficult to kill. Besiege is labeled on all crops but kale; pay attention to your rotations and to the amount of chlorantraniliprole applied.

In Georgetown, aphids have been more active than last year, as have whitefly. Last year whiteflies were present through the month of September and then declined, and did not cause any injury to the plants. In addition to numerous excellent aphicides (Group 4A, C, and D, group 9B, 23, and 29), Exirel, a diamide insecticide, is also labeled for aphids and whiteflies and is an excellent worm product. Orthene is labeled for Brussels sprouts and cauliflower and does a good job on worms. Torac is labeled and has worm activity, but not for cabbage looper. Rimon has worm activity and is also active on whiteflies but not aphids. Movento is good on aphids and whiteflies, and has some worm activity but should be supplemented.

Lima Beans: Soybean looper activity in southern Delaware is increasing. Soybean looper will attack and destroy immature pods. Diamides (Coragen, Besiege) will take out between half and ¾ of the loopers. Intrepid is labeled but will not be effective on corn earworm. What is interesting is that Intrepid Edge is not labeled for lima beans although both Intrepid and Radiant are. Lannate is not labeled for looper, but is for the other worm pests, pre harvest intervals are 1 to 3 days, depending on rates. The Vegetable Production Guide suggests a threshold of 1 worm per 6 ft. If using a sweep net, this probably will come out to about 1.5 per 15 sweeps.

Spinach: Beet webworm is active. Up until now it has largely been feeding on pigweeds. Spinach is in the same plant family and moths find it just as attractive for oviposition. The same goes for beet armyworm. Bt products can be used if worms are small. Keep in mind they have very short residual activity. Radiant, Proclaim, Avaunt, Intrepid and diamides like Coragen, Exirel and Harvanta are all labeled for the worm complex. Intrepid is a growth regulator and should target small worms. Diamides will cause rapid feeding cessation. Diamides and Radiant may also help with leafminers, while the diamides (except Coragen) are also labeled for aphids.

Dr. Owens is the Extension Entomologist at the Univ. of Delaware. From the Weekly Crop Update, Univ. of Delaware Extension, Vol. 28, Issue 26, September 11, 2020.

When to Stop Spraying

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Another factor to consider in late fungicide applications is the amount of the disease in the field. Fungicides work to protect green healthy tissue. Fungicides will not cause lesions to disappear. Therefore, when deciding whether to make a late season fungicide application, realize that one is attempting to protect the green, healthy portions of the field.

Pre-Harvest Interval (PHI) - When applying fungicides close to the final harvest or any harvest keep in mind the PHI. Often growers will need to change what fungicide is used when vegetables reach harvest stage. For example, cantaloupe growers may decide to use a fungicide with the active ingredient mancozeb PHI 5 days early in the season (examples include, Dithane®, Manzate®, Penncozeb®, Roper®). As harvest grows near, however, a fungicide with the active ingredient chlorothalonil might be used since it has a 0-day PHI (examples of products with chlorothalonil include Bravo®, Equus®, Initiate®). The PHI for each crop can be found in the fungicide label with the appropriate crop grouping.

Finally, one should be realistic about applying fungicides late in the season. Which fruit have a realistic chance of maturing before the season is over. For many growers, a late season application of a fungicide is not useful.

[Purdue Vegetable Crops Hotline] issue 666 on Sep. 12, 2019. Dr. Egel is the Extension Plant Pathologist at Purdue Univ. From the Vegetable Crops Hotline, Purdue Univ., Issue 681, August 27, 2020. This is an update of the article "When to Stop Spraying Fungicide" published in the Vegetable Crops Hotline, issue 666, September 12, 2019.

BERRY PRODUCTION

Strawberry Plasticulture Plug Planting: Ways to Increase Chances for Success

Kathleen Demchak and Mahfuzur Rahman

As this growing season winds down, and for the next few weeks, it is a good time to examine vegetable roots for root knot nematode (RKN). I would be suspicious of having RKN if my vegetables seemed to need more water than normal or wilted during the heat of the day and recovered later or plants had nutrient deficiency symptoms rarely seen in your fields and the addition of fertilizers did not seem to alleviate the deficiency symptoms. Other symptoms to be suspicious of include plants in some areas appearing stunted with either lower yields or poorer fruit quality. If these vegetable problems were noticed in spots in the field that seemed to follow down a row year after year, there is a chance you have RKN and you should check your vegetable roots for galls.

'Chandler' plug plants in nursery just prior to shipment. Photo: K. Demchak, Penn State

The propagation process involves growing mother plants in open fields or nurseries to multiply them and/or produce tips through runnering. During this time plants are exposed to pests and diseases from the surrounding environment. The step where plugs are produced from tips/cuttings is relatively short, requiring 4-6 weeks. Harvested runner tips are placed in clean plug trays filled with a soilless planting mix, and trays are then placed under intermittent mist, usually on the ground outdoors after covering it with horticultural landscape fabric. While new infection during the plug production stage is possible, the likelihood is relatively low. Thus, if the tips are pest and disease-free, plug plants are likely to be healthy, too. The plants are exposed to even more pests and pathogens after they get to your fruit production farm, not only from the soil in your field but also from the surrounding landscape and crops and for an extended period of time. So, what can you do to help get your plantings off to a good start, and keep them as healthy as possible?

First, check your plants when you first get them to identify any problem plants. If any plants appear to be weak, cut through a few of them, and look for signs of discoloration in the crown. If crowns are still solid white, chances are that the problem was just drought stress. Reddish or reddish-brown tissue is an indication of anthracnose crown rot, phytophthora crown rot, or a Pestalotiopsis, a new "warm-weather" disease that we need to watch for, which can cause fruit to rot or leaf spots/blight in addition to crown rot.

For most of us, it is difficult to tell these diseases apart, but other symptoms may be present that can provide additional clues to assist in diagnosis. Keep in mind that if you are checking crowns in the spring, you will need to add "winter injury" to the list of the possibilities. Look for the presence of dark elongated sunken lesions on petioles and runner stems, which may indicate plants have an infection from the anthracnose fruit rot-causing fungus. If that infection spreads to the crown, you may see blackening of the crown after making a longitudinal cut. With Phytophthora, entire outer leaves are likely to turn brown and die as they would with severe drought stress. With Pestalotiopsis, which can also kill plants, rather non-descript leaf spots may be present; these leaf symptoms can easily be confused with leaf blotch or Phomopsis leaf blight, but in general, are less acutely V-shaped.

This publication from the University of FL provides much more info along with photos of symptoms: Is Pestalotiopsis a new threat to Florida strawberry production? at https://www.researchgate.net/publication/336813040_Is_Pestalotiopsis_a_new_threat_to_Florida_strawberry_production.

Cultivar can also provide a clue as to which of the above diseases is most likely. 'Chandler' is especially susceptible to both anthracnose fruit rot and crown rot. If you have both 'Chandler' and 'Sweet Charlie', and 'Sweet Charlie' is more severely affected, consider Phytophthora as the likely culprit, as 'Sweet Charlie' is very susceptible if conditions are right for infection. Phytophthora has also been isolated from 'Flavorfest' crowns in the past. 'Sweet Charlie' was affected by Pestalotiopsis in other states, but we don't know the relative susceptibility of various cultivars.

All of this info together is not enough to serve as proof of which of these three crown-rotting diseases is present but can provide a direction for stop-gap treatments you can take (see below) while you contact your supplier or an extension educator, or send a sample to a disease clinic for a more definite diagnosis. Due to the cryptic (asymptomatic) nature of anthracnose infections, your plant supplier may be unaware of any potentially infected plants; however, early communication may be helpful to both of you, and your supplier may have some suggestions for preventative measures you can take.

Second, avoid planting suspicious plants as much as possible. Often, it is a good idea to order 10% or so more plants than you actually need to avoid feeling the pressure to plant everything. Otherwise, you may pause and question whether you should put suspicious plants in the ground, and then plant them anyway. You can use any healthy extra plants later as replacements if needed. If you must use plants of questionable health, planting them in one corner of the field may facilitate taking special care of them. This is also less detrimental than having questionable plants scattered throughout the field where they can serve as potential sources of infection for surrounding healthy plants.

Third, while planting, make sure the planting depth is correct and soil is firmed around the crown. Make sure that anyone involved in planting understands this and its importance. The soil level should be at mid-crown. If the plant is too shallow and roots are showing, the roots will dry out and the plant won't grow well. If too deep, soil will cover the growing point and rots will set in. Have someone check plants that were set and correct any issues. Plants at the wrong depth or without good root-to-soil contact simply will not grow as well as they should.

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Strawberry Plasticulture Plug Planting: Ways to Increase Chances for Success *continued from page 22*

Fourth, either immediately before or right after planting, trim off any dead or dying leaves or runners. Take note of any dark sunken lesions that may be present especially on runners and leaf petioles since this may be a sign of anthracnose organism(s). There are other causes of tissue death including leaves just getting shaded out while in trays, or runners or petioles getting pinched between trays or cooked if on the edge of a tray. However, if you notice these symptoms on plants in the center of a tray, a disease organism is a more likely cause.

Fifth, make any fungicide applications that are needed. In the past, we generally hadn't recommended Fall fungicide applications. However, the very hot temperatures this summer combined with the need to mist plants frequently resulted in conditions that were perfect for development of certain diseases. If phytophthora has been a problem in the past on your farm, or if you are growing varieties that may be susceptible to phytophthora, an application of mefenoxam (Ridomil Gold SL and others) or metalaxyl (MetaStar 2E) through the drip system 15 days after planting is warranted, as are follow-up foliar applications of fosetyl-Al (Aliette WDG) or a phosphite product (Phostrol, Prophyte, etc.) 2 to 3 weeks later.

If anthracnose crown rot or Pestalotiopsis is suspected, captan and Switch both have good efficacy, and should be applied 2 or 3 times during the fall being sure to get good coverage into the crown area. Quadris Top also has some efficacy on Pestalotiopsis. As we are seeing more resistance in anthracnose population against QoIs (category 11 fungicides), it is logical not to use QoI products in the Fall, but you may reconsider that depending on the risk relative to potential infection on your plug plants. It is more important than ever to select your fungicide sprays wisely and rotate among chemistries to avoid control failure. Follow your state's regulations regarding whether products can be used for diseases that are not on the label as long as the use pattern is followed; some states (such as PA) allow this, while others do not.

Lastly, keep the plantings well-watered, and make sure your planting is protected from deer during the fall. Apparently 'Chandler' strawberry plants are one of the tastiest things around. In one of our variety trials, deer nibbled each of our 'Chandler' plots to nothing, passing by "eastern" varieties in the process.

With all of these steps in place (along with following other standard recommendations before and after planting), you will know you've done everything you could to get your planting off to a good start.

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Current Berry Issues

Kathleen Demchak in consultation with Extension Educators

Most plasticulture plantings of strawberries are establishing well. What is becoming apparent, however, is that the shipment of strawberry plant material from place to place makes it very hard to predict which diseases are likely to show up in a given year. Growers should be ready for some of the recurring problems such as anthracnose fruit and crown rot, which will be present on susceptible varieties, while others such as Pestalotiopsis (aka Neopestalotiopsis) warrant keeping an eye peeled.

White druplets are a symptom of sunscald which appears following days with bright sun (Photo: K. Demchak).

Growers should remove spent canes of floricane-fruiting (summer-bearing) raspberries and blackberries if this has not yet been done. Spent floricanes should be cut completely to the ground, as this will remove inoculum of diseases such as cane anthracnose.

Likewise, canes of blueberry plants that are showing symptoms of flagging (cane death with leaves still attached) should be removed now as this may be a sign of cane diseases such as Botryosphaeria and Phomopsis. Lime sulfur can be applied after leaves have fallen off to help with Phomopsis control.

Spotted wing dropsophila remains present in plantings of primocane-fruiting raspberries and blackberries and day-neutral strawberries, requiring continuing applications of effective pesticides. Bright sunshine during the fall frequently results in sunscald on primocane-fruiting raspberries. This should not be mistaken for a disease, and symptoms are generally present on berries for only a few days.

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