

NEWS

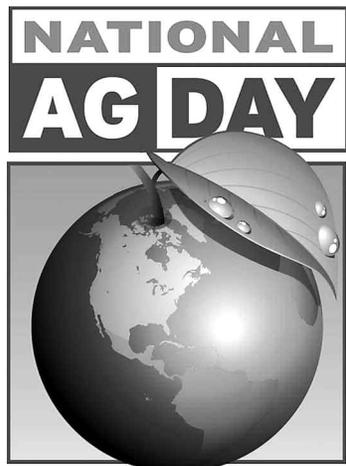
for the commercial vegetable, potato and berry grower



February 2020 / Volume 43 Number 2

Celebrate Spring by Visiting Your Legislator

Every spring the Agricultural Council of America sets aside a day to highlight to the public the vital role agriculture plays in our society. This year's National Ag Day is March 24. PVGA is urging its members to celebrate spring by making plans to visit their state and federal legislator's office to discuss the Association's priorities for 2020. Copies of the Association's state and federal priorities are in the center of this newsletter.



State senators and representatives are often available in their local offices on Thursdays and Fridays because the General Assembly normally only schedules session days on Monday, Tuesdays and Wednesdays. Please make it a point to schedule an appointment with your legislator sometime this

spring (before you get any busier!) to go over the PVGA priorities with him or her.

If you want to team up with some neighboring growers to go as group, that is even better. If one of your farms has a market, greenhouse or high tunnel in operation now, you might want to invite the legislator to come visit your market or farm. If you visit your legislator in his office, you might also consider inviting him to your farm or market later in the year like July or August when the General Assembly recesses for the summer.

You as a grower taking the time to visit your legislator gives him or her the opportunity to personally meet you and understand how government decisions can hurt or help your business. If they have met growers in person and are familiar with their businesses, they are more likely to be conscious of how their decisions can affect your business when they are deciding how to vote on different issues.

While personal visits are the ideal, if you can't find time to visit, at least mail a copy of the Associations' state or federal legislative priorities to your state and federal legislators. Just a short handwritten note explaining that you are a PVGA member

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Shelby Fleischer Receives 2020 PVGA Annual Award

Each year the Pennsylvania Vegetable Growers Association gives its Annual Award to an individual who has a long-standing record of service and dedication to the vegetable, potato and/or berry industry or the Association. This year's Annual Award and a life membership in the Association were presented to Dr. Shelby Fleischer, Professor of Entomology at Penn State University for his 29 years of serving the vegetable growers of Pennsylvania as the vegetable extension entomologist.

A native of Washington D.C., Fleischer attended St. Mary's College in Maryland where he earned



PVGA President Jonathan Strite (right) presents Dr. Shelby Fleischer with the 2020 PVGA Annual Award

his bachelor's degree in Biology. We went on to Virginia Tech for his master's degree and then down south to Auburn University for his doctorate - both degrees in entomology. He worked as a research associate at Auburn before returning to Virginia Tech as a research scientist from 1987 to 1991. In 1991 he started at Penn State as an assistant professor with a research and extension appointment in entomology.

Fleischer served as a grants panel member for regional and national IPM programs, the Methyl Bromide Transitions Program, the Biotechnology Risk Assessment Grants Program, and an EPA Scientific Advisory Panel. He has been an invited symposium speaker at the French Association of Plant Biotechnology, multiple land-grant University seminars, multiple symposia organized by the Entomological Society of America, and a plenary speaker at the Eastern Branch of this society. He received the Distinguished Achievement Award in Extension from the Eastern Branch of the Entomological Society of America in 2011.

(continued on page 2)

NEWS



**Pennsylvania
Vegetable Growers
Association**

*An association of
commercial vegetable,
potato and berry growers.*

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Brian Campbell '21

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Somerset

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Arthur King '21

Valencia

Amy Metrick '21

Butler

Michael Orzolek '21

State College

Christopher Powell '23

Strasburg

John Shenk '23

Lititz

Robert Shenot '22

Wexford

Jeffrey Stoltzfus '23

Atglen

Mark Troyer '21

Waterford

Joel Weaver '23

Windber

Executive Director

William Troxell

Richfield

Shelby Fleischer Receives... (continued from page 1)

His over 100 research publications with over 3,400 citations focus on the structure, dynamics, and management of insect populations and communities in agroecosystems. He was a team member in the analysis that demonstrated areawide reductions of European corn borer from adoption of Bt-maize, which influenced the debate about the risks, benefits, and regional scale implications of using transgenes in agriculture. Work involving neonicotinoids as seed treatments is receiving increased attention due to effects on bees. Recent work is demonstrating the ability of wild bee communities to achieve the ecosystem service of pollination in our agroecosystems. Managing insects that vector plant pathogens has been a research focus, with diabroticites that vector bacterial pathogens in cucurbits, and aphid-vectored viruses in legumes.

Fleischer's Extension activities focus on IPM in vegetable crops, with a priority on advancing economically feasible management that improves worker and environmental safety. His sampling plans have been adopted in alfalfa and hardwood forests in the US, and leafy greens in the Caribbean. The PestWatch web-mapping platform he initiated in 1998 for sweet corn IPM was used by 15 Penn State Extension Educators in 2019. Data flowed from 32 sites distributed among 22 counties in PA, plus sites in MN, NY, DE, VA, and MD.

Now a full professor, he has traveled the state speaking to vegetable growers at numerous local meetings over the last 29 years helping them learn how to control their insect pests – both the common ones affecting sweet corn and cucurbit crops, but also the new arrivals like the allium leafminer. He has also helped growers evaluate new technologies like Bt sweet corn and neonicotinoids and as well as developing the sweet corn insect monitoring network many growers use each year to time their spray schedules.

He and his wife Barbara have two daughters and four grandchildren whom they enjoy visiting.

The Association is pleased to present its 2020 Annual Award and a Life Membership in the Association to Dr. Shelby Fleischer for this long-standing record of outstanding service and dedication to the vegetable growers of Pennsylvania and to the Association.

Celebrate Spring... (continued from page 1)

and asking that your legislator keep PVGA's priorities in mind would be a big help in making our legislators aware of the industry's needs. If a legislator gets one copy of the Association's priorities from a voter in his or her district, it will have more impact than the same set of priorities mailed from the PVGA office. If they get copies of the priorities from several growers in their district, it will have an even greater impact.

When you are calling to make an appointment, if your legislator is not available but a staff person is available, go ahead and take the time to meet with the staff person. Staff people are the ones who brief the legislators on what their constituents are saying to them on a particular issue, so getting PVGA's priorities and your farm's story before a legislative staff person is equally important. This is particularly true for federal representatives and senators who have more constituents and also larger staffs.

Remember to visit at least one of your five legislators: your state representative, your state senator, your federal representative and/or Senator Robert Casey or Senator Pat Toomey. To find your local legislators and their offices, consult your local telephone directory's blue or government pages, go to <http://www.legis.state.pa.us/> or call PVGA at 717-694-3596.

We would greatly appreciate if you could let PVGA which legislators you have contacted. Please send us an email at pvga@pvga.org, call us at 717-694-3596.

Members of the PVGA Board of Directors will be meeting with selected state legislators on Wednesday, March 18, when the legislators will be in Harrisburg.

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 addresses.

Nick Lubecki and Wesley Nell Receive PVGA Young Grower Awards

The winners of this year's PVGA Young Grower Awards are Nick Lubecki of Pittsburgh in Allegheny County and Wesley Nell of Abbottstown in Adams County. This award is designed to recognize outstanding young growers in the vegetable, potato or berry industries. The winners were recognized at the PVGA Annual Meeting in Hershey.

PVGA Young Grower Award recipients must be PVGA members who are 35 years old or younger, who are successfully growing vegetables, potatoes or berries, and who have contributed to advancing or promoting the Pennsylvania vegetable, potato or berry industries. The first recipient of the award was Brandon Christner of Dawson in 2017 followed by Peter Salerno III of Lehighton in 2018. There were no nominations in 2019, so the Board decided to name two recipients this year when there were three nominations received. The prize is free registration for the Mid-Atlantic Fruit and Vegetable Convention plus lodging at the Hershey Lodge.

Nick Lubecki

Nick Lubecki is the farm manager of Braddock Farms, a not-for-profit farm operated by Grow Pittsburgh. The farm was started with the goal of providing fresh local vegetables to the community of Braddock. They are the only source of fresh vegetables in the community. The farm also aims to provide education opportunities for area youth and adults to build their growing skills and spark an interest in agriculture. The farm operates on a bit less than an acre and sells most of the produce through their roadside stand. They also sell produce in other communities which would otherwise lack a grocery store. The farm sells the rest of their produce through a farmers coop: Penns Corner Farm Alliance. They have a few on farm festivals every year including a Zucchini Festival and Harvest Festival which really brings the community together and connects the farm with the public.



Nick Lubecki

Braddock Farm grows mixed vegetables for the roadside stand. They focus on tomatoes, lettuce, cooking greens, onions as well as all the standards. Nick is always exploring more fruit options and has gotten into strawberries and ever-bearing strawberries, blackberries, raspberries and this year planted some exciting table grape varieties from the University of Arkansas. They sell mostly salad, roots and tomatoes through the coop.

They also sell produce in other communities which would otherwise lack a grocery store. The farm sells the rest of their produce through a farmers coop: Penns Corner Farm Alliance. They have a few on farm festivals every year including a Zucchini Festival and Harvest Festival which really brings the community together and connects the farm with the public.

Nick is a first-generation farmer. He got his start in agriculture in 2009 working on a rural vegetable farm in Chambersburg. He started his first vegetable farm in 2012 in the city of Pittsburgh and ran a profitable business until 2016 when he joined Grow Pittsburgh as a farm manager. He currently serves on the leadership committee of the Western PA Young Farmers Coalition, where they are working to organize young and new farmers with the goal of making farming more viable in the area. He is also a member of PASA and Farm Bureau besides PVGA.

Wesley Nell

Wesley Nell is 27 years old and is a first-generation vegetable farmer. After two years of marriage he and his wife decided to pursue the dream of growing food for their community. He was inspired by his father who has grown produce his whole life. The couple rented a couple acres on his grandfather's farm and through blood, sweat and tears they harvested their first five acres of cauliflower.

After that year, Wes was hooked! He invested more into equipment, packing line, and marketing materials. He experimented



Jackie and Wes Nell and family

with some other crops but they didn't always work out. Then they saw the need for locally grown sweet onions in our local supermarkets and the demand and desire for people to buy local. They worked hard and invested in their labels and marketing. He has been successful in working with wholesalers and getting their Pennsylvania product to stand out and fly off the shelves.

Wesley grows five acres of cauliflower and almost two acres of sweet onions. Everything is sold wholesale. He works hard to make a living for his family off the land that he loves. He and his wife love that they get to work beside their two young children and teach them the values of farming.

The Association is pleased to honor these two young growers as a way of recognizing the next generation of Pennsylvania and to inspire and encourage others to pursue growing. PVGA members are asked to nominate a young grower (or themselves) that they think should be recognized with a 2021 Young Grower Award. Simply 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.

NEWS

New Officers and Directors Elected



Brian Campbell (left) incoming PVGA President, presents outgoing President Jonathan Strite with a plaque of appreciation.

Brian Campbell was elected as the new President of the Association by the Board of Directors after the Association's Annual Meeting at the 2020 Mid-Atlantic Fruit and Vegetable Convention on January 29 at the Hershey Lodge in Hershey. He succeeds Jonathan Strite who will assume the office of Past President. Rita Resick was elected First Vice President and Peter Flynn Second Vice President while William Reynolds was re-elected Secretary-Treasurer.

Also at the Annual Meeting, the results of the balloting for members of the Board of Directors were announced. Christopher Harner, Christopher Powell, John Shenk, Jeffery Stoltzfus and Joel Weaver were elected to three-year terms on the Board by the members in the mail-in balloting while Rita Resick was selected by the Board. All but Mr. Weaver are incumbent members of the Board. Each year the members elect five members of the Board and the Board selects one additional director – chosen to insure diversity, geographic representation, and/or special expertise on the Board.

The terms of David Miller and Kenneth Martin expired this year but both had reached the 18-year term limit set by the Board and thus were ineligible to run for re-election. Both Mr. Miller and Mr. Martin had served as President of the Association during their time on the Board. While the terms of seven directors expired, only six directors were elected to new terms as the

number of directors is being reduced from 21 to 18 over a three-year period.

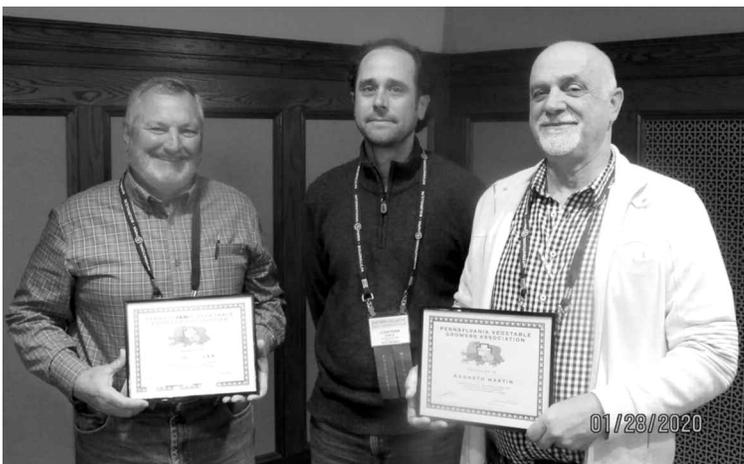
Brief biographies of the newly elected Directors are as follows:

Christopher Harner - Chris Harner from Harner Farm is a third generation fruit and vegetable grower from Centre County PA. I've been working on the farm my whole life, and full time since graduating from PSU with a BS in Ag Business Management in 1994. Currently the farm is composed of a mix of about 40 acres tree fruit, 30 acres of vegetables, and the rest is a mix of Christmas trees, blueberries, grapes, greenhouses, high-tunnels, corn maze etc. We have our own retail location and wholesale to local restaurants, grocery stores and other farms. We've been making the transition to pick-your-own over the years to provide on-the-farm activities for the families in our area. Currently I am a member of SHAP, Appalachian Fruit Growers (Past Pres.), Penn State AG Council, and Pa Farm Bureau. Vegetables are a large part of our business, with the current issues facing us, I would like the opportunity to serve all growers. (Chris has served as a PVGA Director since 2014.)

Christopher Powell – Chris been the owner of Good Harvest Farm in Strasburg, Lancaster County. for the past 28 years. Their farm consists of high tunnel tomatoes, hydroponic lettuce, a wide variety of mixed outdoor vegetable production, a retail garden center and a small CSA plus a year-round farmers market stand in Wayne, PA, at the Lancaster County Farmers Market. He has been a member of PVGA for the past 31 years and the Pennsylvania Vegetable Marketing and Research Board for the past 18 years, currently serving as chairman. Chris has served as PVGA Director since 2017.

Rita Resick - Rita is one of the four owners of 560-acre Laurel Vista Farms in Somerset County. Laurel Vista grows potatoes, green beans, sweet onions, and summer vegetables for sale to the fresh market through Pittsburgh region grocery stores and wholesale outlets under the label "Ken and Rick's Wholesome Vegetables," as well as grains and hay. Rita also developed a line of shelf stable jarred products made from Laurel Vista vegetables, which are available in stores, specialty shops, local community events, and online. In her past career, Rita was President of Farr Communications, Inc., owner and operator of an AM/FM radio station in Charleroi PA. Prior to that, she was the Chief Financial Officer of Medrad, Inc., a medical device manufacturer headquartered in Warrendale PA, now a part of Bayer HealthCare. In addition to her work at Laurel Vista Farms, Rita provides professional consulting services for sustainable agricultural initiatives in Southwestern PA. She currently serves on the Board of Food 21 in Pittsburgh. She is a past director of the Foundation for California University of Pennsylvania, Pennsylvania Association for Sustainable Agriculture, Mon Valley United Way, and Society for Contemporary Craft. Rita has been serving on the PVGA Capacity Development Committee since 2016, on the Board of Directors since 2017 and as Second Vice President since 2018. She and her husband Rick Stafford divide their time between their farm home in Somerset and their city home in Pittsburgh.

John Shenk – John gives credit to the 4-H program for creating an interest in growing berries and vegetables at a young age. He did not grow up on a farm, but was able to get a start in farming by growing and direct marketing them in



PVGA President Jonathan Strite (center) presents retiring directors David Miller (left) and Kenneth Martin (right) with certificates of appreciation.

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NEWS

New Officers and... (continued from page 4)

PVGA Board of Directors for 2020 (seated left to right) Rob Shenot, Rita Resick – First Vice President, Peter Flynn – Second Vice President, Tina Forry, and Amy Metrick. (standing left to right) Bill Troxell – Executive Director, Joel Weaver, Brian Campbell – President, Mike Orzolek, Rob Amsterdam, Bill Reynolds – Secretary-Treasurer, and Jon Strite – Past President. Not shown: Chris Harner, Boots Hetherington, Alan Kemmerer, Art King, Chris Powell, John Shenk, Jeff Stoltzfus and Mark Troyer.

Philadelphia. He and his wife Linda have farmed with their family for 36 years. Along the way, they began to concentrate on growing strawberries for pick-your-own and direct sales. More recently, the focus on strawberries led to developing a strawberry cultivator and beginning Hillside Cultivator Co. John has served as a PVGA Director since 2011.

Jeffrey Stoltzfus - Since 2016, Jeff has been working as the Farm Food Safety educator for Penn State Extension in Lancaster County. Prior to that he spent the 23 years as a farmer educator working for the Eastern Lancaster County School District working primarily with vegetable farmers in Eastern Lancaster County. He assisted farmers in starting an onion growing cooperative and worked with them in areas of production and food safety. He lives on a small farm where he and his family grow strawberries, pumpkins, and beef cattle. Jeff has served as PVGA Director since 2011 and was Second Vice President for one year.

Joel Weaver - Joel is the co-owner of his family's fifth generation dairy farm located in Somerset County, which he operates with his brother, Mark Weaver. He has been growing and marketing sweet corn since the 1970's. The farm also includes 140 acres of grains, hay, and beef cattle. In 2004, the dairy cows were sold and the farm added five acres of vegetables and 3,000 square feet of high tunnels, day-neutral strawberries, raspberries, and blueberries. He markets vegetables, beef, and fruits through a home retail market and four tailgate retail markets in Somerset and Cambria County. Joel has been active member in the Pennsylvania Farm Bureau by lobbying and representing farmers from his area for over thirty-eight years.

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NEWS

Members Adopt Resolutions, Bylaw Revisions

The Annual Meeting of the General Membership of the Pennsylvania Vegetable Growers Association was held on Wednesday, January 29, at the Hershey Lodge in Hershey where the members approved additions to the Policy Resolutions and amendments to the Bylaws.

Policy Resolutions

The following additions to the Association's Policy Resolutions were approved. The underlined text is to be added to the resolutions.

The Association is on record as:

State Resolutions

1. Urging the Farm Service Agency (FSA) State Committee to actively inform growers of the differences between "Jack-O-Lantern pumpkins" and "Howden pumpkins" for the purposes of reporting their pumpkin acreages to FSA and to explain the possible consequences of how they report their pumpkin acreages.
2. Opposing the closing of Regional Department of Agriculture Offices.
3. Supporting online enrollment or reenrollment of lands for DMAP and Red Tag programs.
4. Supporting the increase of Red Tag and DMAP permits to 4 per hunter per property enrolled in the respective programs.
5. Supporting a requirement for PennDOT to notify CDL drivers and commercial truck owners of Spotted Lanternfly regulations and penalties with their license and registration renewal.
6. Supporting a 50-mile radius of operation from the farmer's farm(s) for farm vehicles with the Type B and Type C biennial certification of exemption.
7. Supporting research funding on the effect of new insecticides, seed treatments and diseases on honeybees.
8. Supporting the exemption of H-2A workers' wages from state unemployment contributions.
9. Supporting the state funding of the review of any mandated DEP permit instead of by the permit holder.
10. Supporting the elimination of all permit fees for farmers to repair or replace non-public agricultural culverts, pipes or bridges.
11. Supporting a requirement for government agencies and authorities levying Stormwater Management Fees to offer offsetting credits to those fees for the following:
 - a) Each acre of compliance under each of the following: an NRCS or County Conservation District approved Conservation Plan, an Erosion and Sediment Plan, an Act 38 Nutrient Management Plan, and/or an implemented NRCS Comprehensive Nutrient Management Plan.
 - b) Each approved Manure Management Plan.
 - c) Erosion controlling structures including diversion ditches, grass waterways, stone waterways and terraces.
 - d) NRCS or County Conservation District approved manure holding structures.
 - e) Each acre of forested or wooded acres.
 - f) Positive ratios of pervious to impervious areas."
12. Opposing any fee, tax or ordinance based on stormwater runoff.

State and Federal Resolutions

1. Supporting increased efforts by the state and federal governments to facilitate broadband internet access to all areas of the state.
2. Supporting the exemption of Pennsylvania agriculture from Municipal Separate Storm Sewer System (MS4) requirements mandated under the Federal Clean Water Act, and the funding by the state of all mandated Municipal Separate Storm Sewer System (MS4) implementation practices.
3. Supporting the use of water quality monitoring in local watersheds for the verification of theoretical data in the Chesapeake Bay Model.
4. Supporting the use of genetic engineering of potatoes and the modern, enhanced potato breeding methods that enable breeders to improve potato varieties much sooner than traditional breeding methods.

Federal Resolutions

1. Supporting farm labor reform to ensure growers with access to an adequate legal labor force but opposing the Farm Workforce Modernization Act in the form passed by the House of Representatives.
2. Supporting a requirement for the operator of the UAS to gain the written consent of the landowner and/or farm operator if the UAS will be operating above the landowner's private property.
3. Supporting a requirement by the U.S government, as part of the private-government relationship with the National Crop Insurance Services, (NCIS), that the NCIS Board of

(continued on page 9)

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Members Adopt Resolutions... (continued from page 8)

Directors include at least one active farmer from each of the five major geographical regions of the United States.

Bylaws Amendments

Over the past several years, as a result of the strategic planning initiative in 2014, the Capacity Development Committee has been working to enable the Association to expand its staff capacity to serve Pennsylvania growers. One of the changes they have been working on is changing the tax status of the Association from a 501(c)5 agricultural non-profit to a 501(c)3 charitable educational non-profit organization. That would make the Association eligible for certain grants it is currently not eligible for and also make contributions or bequests from members tax-deductible. Last year the members approved changes to the Constitution (which including changing the name of that document to Bylaws) to allow the transition to the 501(c)3 status and this summer at special meeting approved amendments to the Articles of Incorporation. The Board of Directors since learned that several changes needed to be made to the Bylaws to be consistent with the Articles of Incorporation and to otherwise make some updates. The members approved these proposed changes to the Bylaws as follows: (underlined text is to be added and ~~struck through~~ text is to be deleted)

Article I Name

Section 1 The name by which this organization shall be known is ~~The~~ "Pennsylvania Vegetable Growers' Association" (hereafter referred as the "Association" or "Corporation").

Section 2 The Association shall be incorporated as a non-

~~profit corporation and operated exclusively for charitable, educational and scientific purposes consistent the Internal Revenue Service requirements for a 501(c)3 organization with offices at a location determined by the Board of Directors.~~

Article II Purpose

~~**Section 1** To unite in common organization those engaged in the production, handling or processing of Pennsylvania grown vegetables and small fruits and of others whose business welfare depends at least partially upon the economic efficiency of the Pennsylvania vegetable and small fruit industries.~~

~~**Section 2** To provide educational opportunities, information and materials to keep members of the vegetable and small fruit industries abreast of the latest developments.~~

~~**Section 3** To promote the vegetable and small fruit industries of the Commonwealth and their products in whatever way possible.~~

~~**Section 4** To encourage and support vegetable and small fruit research to increase the profitability of the industries.~~

~~**Section 5** To represent the interests of the vegetable and small fruit industries to the public and government officials although no substantial part of the activities of the Association shall involve~~

~~attempting to influence legislation.~~

~~**Section 6** To engage in any other activities that will benefit the vegetable and small fruit industries.~~

The purposes of the Association are as provided in the Articles of Incorporation.

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NEWS

Members Adopt Resolutions... (continued from page 9)**Article III Membership**

Section 1 Any person or organization covered by Article II, Section 1, with an interest in the purposes of the Association as stated in Article II may become a member by payment of an annual dues. Memberships expire on the day of the next annual meeting unless renewed.

Section 2 Dues and membership classification are to be determined by the Board of Directors and included in the Standing Rules.

Section 3 Each member shall be entitled to one vote in transacting business at any association meeting. The Board of Directors may authorize certain classes of associate members to vote.

Article VII Other Committees and Task Forces

Section 3 The President shall appoint the members of all committees and task forces at the beginning of his or her term of office. The Executive Director shall appoint the members of the committees and task forces unless the Board provides otherwise in the Standing Rules.

Section 4 When committees are empowered by the Board to make final decisions on matters, a simple majority of the number of the appointed members of a committee or task force present at any meeting shall constitute a quorum and questions shall be carried by simple majority of those present. The members of a given committee may be polled by telephone or mail on specific issues or questions, in which case a majority of the total number of appointed members shall be necessary to carry a question. When committees are simply preparing recommendations for the Board, quorums will not be necessary.

Article VIII Association Meetings

Section 1 The annual meeting of the Pennsylvania Vegetable Growers' Association shall be held each winter in conjunction with an annual educational conference at such time and place as the Board of Directors shall determine.

Section 2 The order of business at agenda at the annual meeting shall include:

- (1) Proof of notice of the meeting
- (2) Reading and disposal of minutes
- (3) Annual reports of officers and committees
- (4) Election of directors Announcement of director

election results

- (5) Unfinished business
- (6) Review of Policy Resolutions
- (7) New business
- (8) Adjournment

Section 3 A summer field day, tour or educational meeting shall be held each year at such time and place as may be designated by the Board of Directors.

Section 4 Special meetings of the Association may be called by the Board of Directors.

Section 5 Members shall be given 15 days notice by mail of all meetings of the Association. The notice shall include an agenda of all major items of business expected to be acted upon and the text of any policy or major resolutions.

Section 6 Twenty-five members or two-thirds of the Board of Directors shall constitute a quorum at all meetings of the Association.

Article XII Dissolution

Section 1 In the event of the merger or dissolution of the Association for any reason, all money and securities or other property of whatsoever nature which at the time be owned or under the absolute control of the Association shall be distributed at the discretion of the Board of Directors, or such other persons as shall be charged by law with the liquidation or winding up of the Association and its affairs, to an organization of its choosing which is exempt under Section 501(c)(3) of the Internal Revenue Code or the corresponding section of any future federal tax code, ideally one that has some relation to the agricultural/horticultural purposes for which the Association was originally organized.

In the event of the liquidation, dissolution, or winding up of this Corporation, the assets or property of the Corporation shall be distributed as outlined in the Articles of Incorporation.

Article XV Amendments

Section 1 The Bylaws of this Association may be amended by a two-thirds vote of the members present at any annual or special meeting provided that notice of such proposed amendment is included in the call for this meeting.

Reports Given

The members also received the year-end financial reports which showed a balance of \$233,576 in the General Fund, \$177,155 in the Keystone Fund and \$13,942 in the Onion Committee Fund. President Jonathan Strite reported that

(continued on page 12)

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Mid-Atlantic Convention is Another Success for Growers

The 2020 Mid-Atlantic Fruit and Vegetable Convention continued the tradition of offering fruit and vegetable growers throughout the mid-Atlantic states a first-rate, three-day educational conference with a large industry trade show. About 975 persons registered with PVGA for the three-day event. With about 275 speakers, students, press and guests, the attendance for the vegetable portion of the Convention was about 1,250. That number is a little higher than last year's attendance of 1,215. About 740 fruit growers from Pennsylvania, Maryland, New Jersey and Virginia plus 400 exhibitor representatives put total attendance at about 2,400.

The Convention was attended by persons from Massachusetts, New Hampshire, Connecticut, New York, Delaware, West Virginia, North Carolina, Ohio, Michigan, Maine, Florida, Indiana, Idaho, Wisconsin, California and Mississippi besides growers from the four sponsoring states of Pennsylvania, New Jersey, Maryland and Virginia. The program included speakers from many of the above states plus Iowa, Kansas, Louisiana and Colorado.

This year's keynote speaker was Todd Hunt who spoke on "Communications Bleeps and Blunders in Business". He emphasized the importance of being very precise in communicating with others to minimize the chance for misunderstanding. He also gave examples of innovative ways of communicating and identifying things to avoid misunderstandings.

This year's Convention was 43rd year that fruit and vegetable growers from Pennsylvania, Maryland and New Jersey met together at Hershey. They have been joined by the Virginia fruit growers for the last seven years.

The three-day Convention featured six to nine concurrent educational sessions on all three days including, for the eleventh year, two sessions in Spanish. In addition, the Convention included six pre-convention workshops on January 27 plus a farm market bus tour with over 305 participants. The workshops covered leadership cultivation; tomato production; bees, pollinators and pollination; farm food safety; hemp production and pesticide applicator license training. The farm market bus tour included visits to Good Harvest Farm and Cherry Crest Adventure Farm in Strasburg, Kitchen Kettle Village in Intercourse, Harvest Lane Farm in Lititz; and Masonic Village Farm Market in Elizabethtown. Exhibits from 167 companies and organizations displayed their products and services in the exhibit halls all three days.

Greg Donaldson from the New Jersey State Horticultural Society was the Convention Joint Committee chairman for 2020. Brian Campbell was chairman of the PVGA Convention Planning Task Force. The educational sessions were organized by the following individuals:

- Basic Vegetables: Steven Bogash – Marrone Bio Innovations and Dr. Beth Gugino, Penn State Univ.
- Leafy Greens: Arthur King – Harvest Valley Farms and Leah Fronk – Penn State Extension
- General Vegetables: Dr. Michael Orzolek – Penn State Univ. (retired) and Dr. Timothy Elkner – Penn State Extension



Todd Hunt, 2020 keynote speaker.

- Organic Vegetable Production: Dr. Elsa Sanchez – Penn State Univ.
- Tomatoes: Kenneth Martin – Furmano Foods and Dr. Beth Gugino - Penn State Univ.
- Greenhouse Ornamentals: Sinclair Adam and Nick Flax – Penn State Extension
- Cut Flowers: Thomas Ford and Sinclair Adam – Penn State Extension
- Cole Crops: Dr. Beth Gugino – Penn State Univ. and Steven Bogash – Marrone Bio Innovations
- Soil Health: Rob Amsterdam - Feeding America, Megan Chawner – Penn State Extension, and Susan Richards – Capital RC & D

(continued on page 12)

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NEWS

Mid-Atlantic Convention... *(continued from page 11)*

- Small Fruit – Kathy Demchak – Penn State Univ.
- Sweet Corn: John Esslinger – Penn State Extension and Brian Campbell – Brian Campbell Farms
- Composting: Rob Amsterdam – Feeding America and Megan Chawner – Penn State Extension
- Greenhouse Vegetables: Steven Bogash – Marrone Bio Innovations and Nick Flax – Penn State Extension
- Sweet Potatoes – Thomas Butzler – Penn State Extension and Dr. Luis Duque – Penn State Univ.
- Pumpkins & Vine Crops: Thomas Butzler and Dr. Timothy Elkner – Penn State Extension
- Farmers Health – Tanner Delvalle and John Esslinger – Penn State Extension
- Alliums – Dr. Timothy Elkner – Penn State Extension
- Potatoes: Robert Leiby – PA Co-Operative Potato Growers and Robert Pollock – Penn State Extension
- Food Safety – Jeffrey Stoltzfus – Penn State Extension
- High Tunnels – Dr. Francesco Di Gioia – Penn State Univ. and Thomas Ford – Penn State Extension
- Legumes – Leah Fronk – Penn State Extension

Members Adopt Resolutions...*(continued from page 10)*

Board and committee members participated in a strategic planning session in December of 2019.

Past President David Miller announced the results of the balloting for the Board of Directors as reported in a separate article. He noted that one Rudolph Grob Memorial scholarship had been awarded to Wyatt Kosa. He also presented Young Grower Awards to Nick Lubecki and Wesley Nell.

Secretary-Treasurer William Reynolds reviewed the budget adopted by the Board of Directors which anticipates \$481,600 in income and \$469,300 in expenses in the General Fund. He noted that membership was 791 after the second day of the convention, up from last year's second day membership of 738. Last year's membership at the end of the year was 956. He reported a preliminary total of sales at the Farm Show Food Booth to be \$238,883, a new record in total sales.

Robert Amsterdam reported on the work of the Capacity Development Committee which is looking at how the Association can add additional staff capacity. The Association working to become a 501(c)3 organization that would be able to receive tax-exempt contributions. They have also proposed a process for developing a succession plan.

Educational Committee chairman Brian Campbell reported that convention attendance was at 1,024, up from last year's attendance as of the second day of 975. Regional educational events are being planned for the summer along with continuation of the newsletter, website and email updates as the Association's communications to members.

Government Affairs Committee chairman Rita Resick reported that legislative visits are being planned for March. It was reported that the Vegetable Marketing and Research Board would meet that evening to select research projects to fund for 2020. The Association budgeted up to \$60,000 for the vegetable research projects. It was also reported that the Board of Directors had approved \$10,869 to fund three berry research projects.

The members recognized the passing of the following members and friends of the Association in the past year: Jonathan Grace, Timothy Weiser and William Geise, Sr.

- Wholesale Marketing: Laura England – PA Dept. of Agriculture, Lela Reichart – Sterman Masser Inc. and Richard VanVranken – Rutgers Cooperative Extension
- Creative Displays: Brian Moyer, Alicia Anderson and Tanya Lamo – Penn State Extension
- Retail Marketing: Brian Moyer – Penn State Extension
- Marketing 101: Brian Moyer and Tanya Lamo – Penn State Extension and Dr. Claudia Schmidt, Penn State Univ.
- Social Media Plan: Shannon Dill and Ginger Meyers – Univ. of Maryland Extension and Sarah Cornelisse – Penn State Univ.
- Agritourism: Dr. Claudia Schmidt and Sarah Cornelisse - Penn State Univ., William Hlubik – Rutgers Cooperative Extension
- Value Added: William Hlubik and Richard VanVranken – Rutgers Cooperative Extension

Other members of the Convention Planning Task Force were: Matthew Christner, Diane Erb, Shelby Fleischer, Peter Flynn, Christopher Harner, William Reynolds, Steve Sample, Christ Stoltzfus, Grant Troop, and Adam Voll

Ag Choice Farm Credit and MidAtlantic Farm Credit sponsored a grower reception prior to the annual Fruit and Vegetable Growers Dinner on January 28. PVGA presented its Annual Award and a Life Membership to Dr. Shelby Fleischer (see separate article). The State Horticultural Association presented their annual award to Matt Strite and Farm Show awards to Hollabaugh Bros. Orchards and Peters Orchards.

(continued on page 14)



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Directors Meet at Hershey

The Association's Board of Directors held their regular winter meeting on January 27, 2020, at the Hershey Lodge the night before the opening of the Mid-Atlantic Convention.

The Board reviewed the report from Gregg Robertson who had facilitated the strategic planning sessions that the Board and committee members participated in on December 9. They discussed several issues and ideas that surfaced during the December meeting, including:

- scholarships for Convention attendees
- increased focus on sponsoring local twilight meetings
- providing better information on membership at local meetings
- insuring there is adequate science in educational presentations
- being conscious of competing winter meetings and
- the cost of lodging at the Mid-Atlantic Convention.

The Capacity Development Committee reported that it will be preparing to file the necessary forms with the Internal Revenue Service for the transition to 501(c)3 status after the Annual Meeting. It will also plan to study the strategic planning report.

Directors approved changes to the Rudolph Grob Memorial Scholarship opening the scholarship to students who are not from PVGA member families and to students from PVGA member families who are pursuing an agriculture-related career but not necessarily a career in the vegetable, potato or berry industries.

The Board reviewed the preliminary reports from the Farm Show Food Booth noting the success of the infused water and

berry-battered Oreos, both new menu items.

The Board adopted a budget for 2020 that anticipates \$481,600 in income and \$472,300 in spending. The budget has a projected surplus of \$9,300 and allocates a potential total of \$74,000 for research - \$60,000 for vegetable research and \$14,000 for small fruit research – although not all the small fruit research funds will be used.

The budget leaves a projected General Fund balance of \$240,700 at the end of the year, well above the target level balance of \$172,300. The Association purposely maintains a sizeable balance in the General Fund to enable it to self-insure itself against unexpected decreases in revenue. Bad weather during the Farm Show or Convention can significantly decrease the income in any given year but the General Fund reserves will enable the Association to maintain its support for research, promotion and other activities even though income may be lower than expected.

The General Fund reserves are maintained in mutual bond funds and a 12-month certificate of deposit. Because the amount of monies in the General Fund checking account becomes low near the end of the year, the Board did previously vote to stop transferring \$1,000 per month to the bond fund account and also, at least for the time being, to discontinue the General Fund contribution to the Keystone Fund.

The Board approved funding totaling \$10,869 for three berry research project proposals received from Kathleen Demchak at Penn State University. The Association's \$60,000 vegetable research allocation, will be added to the \$20,000 in

(continued on page 31)

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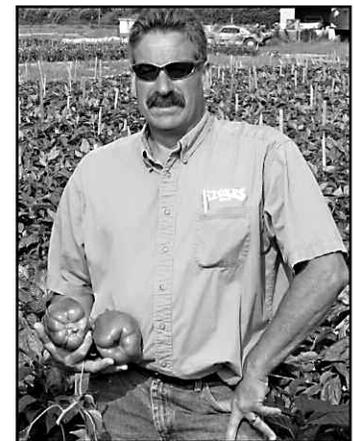
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NEWS

State News Briefs

PVGA Farm Show Booth Sets Sales Record

The 2020 PVGA Farm Show Food Booth set another new sales record of \$238,600, topping the previous sales record of \$223,500 set last year.

There were several significant changes again made in the booth operations designed to increase efficiency and increase profit. First, three new menu items were added – infused water, berry-batter-dipped Oreos, and batter-dipped snap beans – while several menu items were dropped because of low sales volume – chili, vegetarian vegetable soup, pumpkin pie, bean salad, garden salads, vegetable wraps and tomato juice. More details will be printed in the March newsletter.

Farm Vitality Planning Grants Available

State grants are available for farms to develop business or transition plans to ensure their long-term economic viability.

Up to \$1 million is available through the Pennsylvania Farm Bill adopted last year. Funding is available for farmers or prospective farmers to create or obtain business plans to enhance the farm's long-term viability, plans for transitioning ownership of the farm to a family member or another owner and plans to diversify or expand an existing farm.

Grants of up to \$7,500 are available to cover up to 75 percent of project costs.

Grants are first-come, first-served. The application period will close April 3 or when funding is exhausted.

Mid-Atlantic Convention...

(continued from page 12)

Sponsors for the banquet included Kirby Agri, Inc., Knouse Foods Cooperative, Rice Fruit Company, and the State Horticultural Association of Pennsylvania (Platinum Level \$1,000 or more); Adams County Nursery, Bernard C. Morrissey Insurance, Inc., Hess Brothers Fruit Co., PVGA and The Pabody Agency (Gold Level \$500 to \$999); Maryland State Horticultural Society, New Jersey State Horticultural Society, Nourse Farms, Inc., The Core Group (Bear Mountain Orchards, Bream Orchards and El Vista Orchards), and the Virginia State Horticultural Society. (Silver Level \$250 to \$499); and Frey Group LLC – Coast of Maine Brands, Pennsylvania Farm Bureau and Wafner Nursery (Bronze Level \$100 to \$249). The following seed companies generously sponsored coffee during the trade show: Johnny's Selected Seeds, PanAmerican Seed, Rupp Seeds Inc., Sakata Seed America Inc., Seedway LLC and Stokes Seeds Inc.

The American Fruit Grower magazine sponsored three of the tree fruit sessions and the American Vegetable Grower magazine sponsored three of the vegetable sessions. International Paper sponsored the lanyards for attendees.

On the second night of the Convention, PVGA hosted the twenty-first annual Ice Cream Social. Generous portions of ice cream and a choice of toppings (including Hershey's chocolate syrup, of course) were accompanied by potato chips. Utz Potato Chips and Herr Foods donated potato chips for the event.

The planning committees will meet in March and April to begin planning for next year's edition of the Mid-Atlantic Fruit and Vegetable Convention which will be held February 2 to 4, 2021.

Apply or learn more at www.agriculture.pa.gov/Pages/Farm-Vitality-Planning-Program.aspx.

From Penna. Agricultural Alliance Issues Update, Penna. Farm Bureau, February 2020.

PGC Proposes Sunday Hunting Dates

At the Board of Game Commissioners quarterly meeting in January, the board gave preliminary approval for the dates of three Sundays where hunting will be allowed next season under the recently passed Sunday hunting expansion law.

All three proposed Sundays fall in the month of November: Nov. 15, an extension of deer archery season; Nov. 22, as part of a four-day bear firearms season; and Nov. 29 as part of the opening weekend of deer firearms season. The Saturday opener, which was enacted last season, was also approved to remain as part of the expanded deer firearms season.

In addition, commissioners tentatively approved a 14-day concurrent deer season, which will expand opportunity to hunt antlerless deer to the two full weeks of deer season. The number of antlerless tags available to hunters will most likely be adjusted in response to the longer season.

The board also approved an expansion of the Deer *(continued on page 31)*

In Memory

William Geise, Sr.



William Samuel Geise Sr., 82, was welcomed into the arms of his Lord and Savior Jesus Christ on January 28, 2020, at his home in Northumberland.

He owned and operated Geise's Sweet Corn Farm for 32 years. He and his family worked with many young people in the area over the years mentoring them in a strong work ethic.

Bill was a member of First Baptist Church in Danville where he served in the choir, as a Sunday school teacher and superintendent, on the board of trustees and on the building committee when the church relocated to Valley Township. A founding member of the Tuckahoe Fire Company in Point Township, he also served on the Point Township Board of Supervisors for 16 years. He was president of the Northumberland Farmland Preservation Program and served on the Northumberland County Agricultural Security Area Committee. He began his farming career raising hogs and was chairman of the PA Pork Producers. He and his wife were very involved in the Northumberland County Farm Bureau for 32 years and Bill also served on the PA Farm Bureau state-wide board for eight years. He and wife were given the 2015 state-wide Distinguished Local Affairs Leader Farm Bureau Award. A PVGA member, he helped set up and tear down the Farm Show food booth for many years.

Known by his family as Mr. Fixit, he would always lend a hand of support to any of them when the need arose. He made sure to go above and beyond for everyone that he encountered. Bill was deeply devoted to his family; he cherished his wife, his children and grandchildren. He was known as a selfless man with a generous heart and a kind spirit.

In addition to his wife, Mollie, he is survived by one son, and his wife; one daughter and her husband; and three grandchildren.

Adapted from the Daily Item, January 29, 2020.

Six Scholarships Available in 2020 PVGA Scholarships Criteria Revised

The Pennsylvania Vegetable Growers Association is pleased to be able to offer two Rudolph Grob Memorial Scholarships each year students pursuing higher education. Previously the scholarships were only available to children or grandchildren of PVGA members who were pursuing a career in the vegetable, potato, or berry production industries. However, only one scholarship was awarded in 2017 and 2019 and none were awarded in 2018 due to lack of applicants. Therefore the Board of Directors approved revisions to the scholarship criteria to make it available to a broader range of students.

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

The purpose of the scholarship is to assist students in obtaining a baccalaureate or associate degree that will enable them to pursue a career in the vegetable, potato or berry production or related industries or businesses. Children or grandchildren of an Association member who has been a member in good standing for one or more years and who are pursuing a degree in an agriculture-related field may also be considered.

Preference will be given first to children or grandchildren of Association members who are pursuing career in the vegetable, potato or berry production or related industries or businesses. Second preference will be given to non-member students who are pursuing a career in the vegetable, potato or berry production or related industries or businesses. Last preference will be given to children or grandchildren of members who are pursuing a degree in an agriculture-related field but necessarily in the vegetable, potato or berry industries.

Applicants be currently enrolled or be planning to enroll in a two-year associate or four-year baccalaureate degree program at an accredited institution and be in good academic standing.

The \$1,000 scholarship will be awarded to two students for a one-year period although if funds are available and there are not other qualified applicants, the committee may award \$2,000 scholarships. Recipients may apply for a renewal although preference will be given to other qualified students over previous recipients. It is not a need-based scholarship.

The following items must be included with a completed application form:

- A copy of the most recent academic transcript.
- Two letters of reference from someone outside of the immediate family.
- A typed essay (approximately 500 words) on one of the following topics:
 - Describe the biggest issue that has faced the Vegetable/Potato/Berry Industry in Pennsylvania in the last five years or that the Industry will face in the next five years and how you plan to deal with this issue in your future career, or
 - Describe your previous experiences with the Vegetable/Potato/Berry Industry and the role you hope to play in the Pennsylvania Vegetable/Potato/Berry Industry upon graduation.
 - Describe your previous experiences in agriculture and the role you hope to play in agriculture upon graduation.

Applications must be received or postmarked by April 30, 2020, and are available by contacting PVGA at 717-694-3596 or pvga@pvga.org. The application is also available on the website at <https://www.pvga.org/services/rudolph-grob-memorial-scholarship/>. The scholarship committee may request to interview the applicant in person or by telephone as well as contact college or school advisors and/or references. If you have a child or grandchild in college, encourage them to apply for the scholarships.

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NEWS

PVGA Funds Vegetable and Small Fruit Research Projects

This year, the Pennsylvania Vegetable Growers Association will again contribute \$60,000 towards vegetable research and nearly \$11,000 for small fruit research. The Board of Directors budgeted \$74,000 for vegetable and small fruit research in 2020 however not all the money budgeted for small fruit research will be spent. This year's contributions put PVGA's funding for research over the past 32 years at \$1.26 million.

The research funding has been made possible through the profits earned at the Association's food booth at the Farm Show and profits from the Mid-Atlantic Fruit and Vegetable Convention.

The following ten vegetable projects are being funded for \$80,000 in conjunction with the Vegetable Marketing and Research Program, which will contribute about \$20,000 towards the projects. The projects approved for funding with their objectives are listed below.

Implementing On-Farm monitoring Tools for the In-Season Sustainable Management of Soil Fertility and Health in High Tunnel Conventional and Organic Vegetable Production Systems \$10,000

Francesco Di Gioia, Penn State Univ. and Leah Fronk, John Esslinger, Thomas Butzler and Thomas Ford, Penn State Extension

- to test the proposed on-farm (site-specific) in-season nutrient and soil health monitoring method in high tunnels at commercial scale and transfer the method to Extension Educators, growers and crop consultants.

Assessment of Nitrogen Input Requirement of Grafted and Non-Grafted Fresh-Market tomato Grown in High-Tunnel \$9,932

Francesco Di Gioia, Elsa Sanchez and Claudia Schmidt, Penn State Univ. and Timothy Elkner, Penn State Extension

- to evaluate the response to nitrogen inputs of determined- and indeterminate-type fresh-market tomato varieties grafted or non-grafted onto commercial rootstocks and grown on mulched beds with drip irrigation in high-tunnel production systems at two locations: South East and Central Pennsylvania.

Cover Crops as a Solution to High Soluble Salt Levels in High Tunnels \$8,360

Elsa Sanchez, Penn State Univ. and Tom Ford, Penn State Extension

- to evaluate using cover crops to extract soluble salts from high tunnel soils.
- to test 20 cover crop types in a greenhouse in soil with high soluble salt levels to determine drawdown.
- to determine which specific cover crop types are best for drawing down salt levels.

A Survey to Determine if Soilborne Pathogens Are Potentially Limiting Yields in PA Tomato High Tunnel Production \$6,000

Beth K. Gugino and Elisa Lauritzen, Penn State Univ.

- to conduct a wider-scale sampling of tomato high tunnels across PA focusing on those that have been in continuous tomato production for at least three years or more.

Breeding Fresh-Market Tomatoes for Production in PA \$8,000

Majid Foolad, Penn State Univ.

- to re-evaluate 52 selected large-size fresh-market (FM) tomato F₁ hybrids.
- to re-evaluate 33 selected large-size late-blight-resistant (LBR) FM F₁ tomato hybrids.
- to re-evaluate 17 selected grape tomato F₁ hybrids, and production and evaluation of a total of 48 new grape tomato F₁ hybrids.
- to develop and evaluate elite inbred lines of large-size FM tomato breeding lines with LB resistance and other desirable characteristics.
- to evaluate Penn State elite large-size FM tomato breeding lines.
- to evaluate elite inbred lines of FM grape tomatoes with various desirable characteristics.
- to genetically characterize of additional sources of LB resistance to identify new LB resistance genes.

Breeding Processing Tomatoes for Production in PA \$6,000

Majid Foolad, Penn State Univ.

- to re-evaluate a total of 28 selected elite regular processing tomato F₁ hybrids.
 - to re-evaluate a total of 9 selected elite late-blight-resistant
- (continued on page 17)*

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NEWS

PVGA Funds Vegetable... (continued from page 16)

(LBR) processing tomato F₁ hybrids.

- to look at large-scale seed production (in Costa Rica) and evaluate a total of 12 NEW LBR processing tomato F₁ hybrids.
- to field evaluate Penn State's advanced processing tomato breeding lines.
- to develop and field evaluate Penn State's advanced processing tomato breeding lines with LB resistance.

HPPD Herbicides for Weed Control in Sweet Corn \$4,897

Dwight D. Lingenfelter and Dr. John M. Wallace, Penn State Univ. and Dr. Mark J. VanGessel, Univ. of Delaware

- to find out how postemergence HPPD herbicides differ in weed control efficacy.
- to find out how weed control efficacy and weed control spectrum differ when postemergence HPPD herbicides are applied with and without atrazine.
- to find the effect of postemergence HPPD herbicides on the establishment rate of various post-harvest seeded cover crop species.

Keeping PA Vegetable Growers Profitable: Statewide Cultivar Trials \$15,000

Elsa Sanchez and Francesco Di Gioia, Penn State Univ. and Tim Elkner, Tom Butzler and Bob Pollock, Penn State Extension

- to evaluate up to 25 cultivar and selections of spring and fall cabbage in a conventional plasticulture system.

Impact of Management Practices on Soil Health Indicators in Conventional and Organic Vegetable Cropping Systems (multiyear) \$8,000

Dr. Gladis Zinati, Rodale Institute

- to demonstrate to vegetable growers the role of management practices on soil health over time.

Overlapping Dual Magnum Programs for Weed Control in No-Till Pumpkins \$5,000

Kurt Vollmer and Kelly Nichols, Univ. of Maryland Extension, Dwight D. Lingenfelter and John M. Wallace, Penn State Univ.

- to evaluate potential of Dual Magnum as an overlapping residual approach for pumpkin production throughout the Mid-Atlantic Region.

In addition to the above ten projects funded by the Vegetable Marketing and Research Program and PVGA, the Association's Simply Sweet Onion Committee is funding the following project:

Onion Variety Trial \$6,539

Tom Butzler, Jeff Stoltzfus and Tim Elkner, Penn State Extension and Mike Orzolek, Penn State Univ.

- to evaluate the marketable yield and quality

(sugar and pyruvic acid level) of onion varieties that have the potential to become part of the Simply Sweet Onion Program for Pennsylvania growers.

The following two proposals were not funded because there were insufficient funds available for them:

Exploring Anaerobic Soil Disinfestation as a Biological Method to Manage Root-Knot Nematodes and Enhance Soil Health in High Tunnel Vegetable Production Systems \$10,000

Francesco Di Gioia and Beth Gugino, Penn State Univ.

- to assess the efficacy of ASD in managing root-knot nematodes (RKNs) in high tunnel production systems under PA environmental conditions. This will be achieved in two steps testing the technique first in preliminary and then on farm at field scale.

Comparing Cover Crops to Solarization and Occultation as Weed Management Tools in Organic Vegetable Systems \$7,321.20

Dr James DeDecker, Michigan State Univ.

- to compare the effect of a three species cover crop mix, solarization and occultation on weed emergence and growth at two different timings representing preparation for an early and late season vegetable crop.
- to measure the effect of our treatments on short-term soil health by quantifying soil respiration and active carbon immediately before and after treatment.
- to share results of our study with organic vegetable growers across the Great Lakes Region through a field day event, print and digital media.

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NEWS

Study Helps Direct-Market Vegetable Farmers Gain Clarity on Farm Finances

Direct-to-consumer markets, including farmers markets, CSAs, and direct-to-retail, are a \$439 million industry in Pennsylvania. Yet, little information is available to help farmers make data-driven decisions about how to structure and hone their business models to optimize direct-market revenue.

With its multi-year Diversified Vegetable Financial Benchmark Study, which began in 2017 with support from the U.S. Department of Agriculture and Heinz Endowments, Pasa Sustainable Agriculture is collaborating with vegetable farmers across Pennsylvania and the surrounding region to create the only robust dataset for understanding the financial viability of farm businesses selling through direct-markets.

With financial benchmark data at hand, farmers will be able to develop more accurate goals for income and revenue growth, learn best business practices from their high-performing peers, and show lenders, land holders, and investors the business opportunity vegetable farms provide.

Over the past year, Pasa has expanded its study to include 41 vegetable farms. Study participants range from beginning farmers in their first year of business, to established farmers with decades of experience under their belts.

To participate in the study, farmers can participate in one of two upcoming free webinars hosted by Pasa (details below). During these webinars, participants will complete a detailed financial survey about their vegetable farm that will take up to two hours to complete. Pasa will also share highlights and lessons learned from the study to date. All participants will ulti-

mately receive a personalized direct-market financial benchmark report detailing how their finances compare to other farms across Pennsylvania and the U.S.

All participants are eligible to receive a \$100 stipend for completing the study, and must prepare some basic 2018 financial records before the workshop. General results from this study will be shared publicly, but individual farm data will be kept confidential.

At this time, participation in this study is limited to for-profit diversified vegetable operations. If interested farmers are not able to attend a webinar, they can still contact research@pasa-farming.org or call 814.349.9856 to learn about other options for participating.

Webinar details:

Thursday, March 26th, 2020, 12 - 2 p.m.

Please visit pasafarming.org/events or call 814-349-9856 to register.

PA Farm Markets Launches Maps of Markets

The National Ag Statistic Service (NASS) has determined that Pennsylvania leads the nation in the number of farms that sell direct-to-consumer. Now, PA Farm Markets has given us a clearer picture of what some of those direct-to-consumer markets look like. PA Farm Markets has just released its first ever maps of markets in Pennsylvania. The three maps identify farmers markets, retail farm markets and public markets throughout the Commonwealth.

PA Farm Markets promotes the vitality and growth of Pennsylvania's Retail Farm Markets, Farmers Markets, and Public Markets and shares resources and best practices as well as provide education, promotion, and cooperation.

Farmers markets are usually open-air markets that are held once a week with multiple farm and food vendors. Retail farm markets are markets that are a building or roadside stand that are open multiple days typically owned by a farm and public markets are made up of many types of vendors usually in a building.

According to PA Farm Markets, Pennsylvania has 685 retail farm markets, 337 farmers markets, and 56 public markets reflecting Pennsylvania's great agricultural heritage and diverse farms with the oldest open air market in the country in the city of Easton established in 1752 as well as the oldest, continuously running public market can be found in Lancaster city, the Lancaster Central Market founded in 1730.

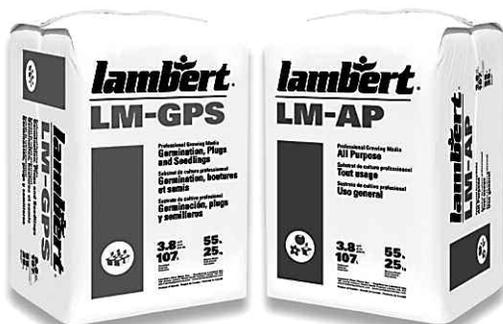
On the maps, markets are identified by dots which can be clicked on to see the market information which includes the market name, website and contact information. You can zoom in on any county to see that county's markets and their location.

To see the maps, go to www.pafarm.com. The three maps are in the "resources" link on the home page.

If you have a market and don't see it on any of the maps and would like it listed, you can contact PA Farm Markets through their website or email pafarmmarkets@outlook.com.

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PVGA-PVMRP Sponsored Research Managing Allium Leafminer

Shelby Fleischer, Tim Elkner, Brandon Lingbeek, Lauren Briggs

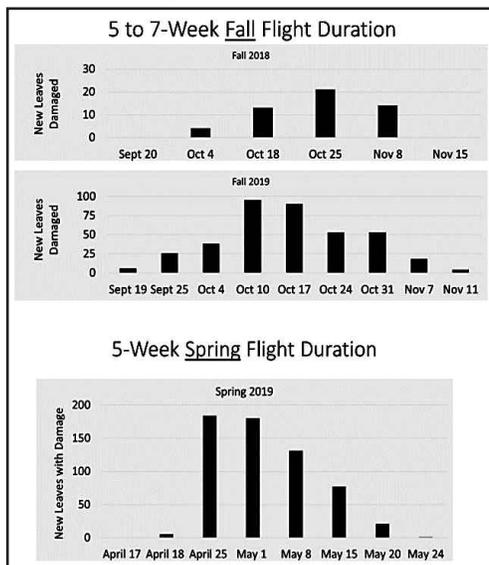
Allium leafminer (ALM) is an invasive fly that attacks multiple species in the *Allium* genus. First detected in PA, it has spread to an additional 5 states. We have documented damage to onion, garlic, leek, scallions, shallots, and chives. To advance management, we focused on:

(i) Defining 'fly-free' periods. Information on the timing of adult activity helps with timing insecticides, limiting applications to shorter periods, and using row covers or other cultural controls. Data collected for this objective will also help to develop a degree-day model predicting initiation of spring emergence.

(ii) Determining efficacy of conventional and organic insecticides, including under the Simply Sweet[®] production system. In these studies, we also collected data on the pattern of larval/pupal damage among the different allium crops, and used samples to search for parasitoids.

Identify fly-free periods and develop a spring-emergence predictive model. We measured the timing of adult flight by scouting hosts on farms, and on sentinel plots. Monitoring occurred weekly during the spring (Apr. through May) and fall (Sept. through Nov.) generations. We monitored ALM throughout Central and Eastern Pennsylvania using 3 techniques: emergence cages, portable trays of allium crops and active scouting, to determine which is best for detecting first emergence. We used field observations of ALM emergence to estimate degree-day thresholds for first emergence using the Root Mean Square Error (RMSE) iterative method and recorded the number of new damaged allium leaves to determine ALM flight duration. We took x-rays of ALM puparia stored at different temperatures to examine development from larva to pupa. Activity was defined as the occurrence of oviposition marks or mines in leaf tissue. Emergence cages (~0.25m²/cage, 15 cages) were placed over overwintered leeks and scallions with evidence of infestation and checked for emerging adults. To predict initial spring activity, we used NOAA data to determine the degree days from January 1 to initial adult activity (measured with both oviposition marks and emergence cages) from our field data. These methods to estimate degree day thresholds from field data require data from a series of site-years.

Determining efficacy of conventional and organic insecticides. Replicated complete block experiments were conducted during the spring and fall ALM generation at the SEREAC, Lancaster Co. Spring trials were on onions, produced as in the Simply Sweet[®] program. In 2018, these were transplanted in the 3rd week of April and harvested July 19, and in 2019 these



were transplanted April 8, 2019 and harvested July 11, 2019. Fall trials were in 'Tadorna' leeks. In 2018, these were seeded May 7; transplanted to field July 5; harvested December 4. In 2019, these were seeded May 28, transplanted July 30, and harvested November 11. Both foliar and drip-applications under black plastic mulch were evaluated. We evaluated 8 (3 organic, 5 conventional) insecticide options in 2018, and 6 (3 organic, 3 conventional) in 2019 (Tables 1 and 2). Each treatment was applied to in a randomized complete block RCB design. The surfactants LI-700 and MPede was included for all conventional and OMRI-listed applications, respectively. All treatments were replicated 4 times in each trial. Foliar products were applied using a CO₂-pressurized backpack sprayer and boom equipped with twin flat-fan nozzles (TJ-60 8003VS) each positioned over a row and calibrated to deliver 40 gallons per acre at 40 psi. Drip-applications involved 4 rows of transplants at 6-inch centers on raised beds covered with black plastic, and two drip-tape lines. Oviposition marks will also be assessed on a subsample of plants prior to application, and once during the middle of the trial. At harvest, plants were dissected for ALM larvae and pupae, and measured how the larva vary in their damage pattern to bulb onions and leeks.

Results

Identify fly-free periods and develop a spring-emergence degree-day model. Active scouting, including scouting wild
(continued on page 20)

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VEGETABLE PRODUCTION

Managing Allium... (continued from page 19)

Allium species, is the best method to detect first emergence of ALM: emergence cages did not match ALM activity in the field and portable trays of alliums sustained little damage. The RMSE method, using field-collected pupae reared in the lab, suggests that spring emergence starts at 250 Celsius degree-day, using a lower developmental threshold of 3.5 degrees Celsius. These values also were very close to the optimum solution when using only field scouting data, although another solution (0.5 C lower threshold, and 400 degree-days) was slightly better. We plan to trial this degree-day model to alert growers to when to expect initiation of the spring emergence. Following emergence, flight duration occurred over 5-7 weeks (Figure 1). Development from eggs to pupae took 22 days at 17.5°C, 20 days at 25°C, and 40 days at 30°C resulted in one hundred percent mortality. Pupal development was also a function of temperature: it took 5 days at 22°C and 21 days at 4°C for an exarate adult to develop within the puparia.

Determining efficacy of conventional and organic insecticides

Onions. In both 2018 and 2019, we had good insect pressure, measured by oviposition marks. However, > 99% of the bulbs had no ALM, even in the control plots. Thus, although we could not evaluate insecticide efficacy in onions, we could document risk of larvae or pupa showing up in bulbs. The very low occurrence of ALM to onions that were planted following the timing and methods used for the 'Simply Sweet' production was concentrated in the outer leaves that senesce during bulb formation and thus become the scale leaves (the outer 'papery' coating that surrounds the bulb at harvest). We do not know if this is due to the timing of infestation given the plant growth stage when 'Simply Sweet' onions are transplanted, or the way in which larvae feed within the hollow onion leaves, or a combination of both. Regardless, this suggests that risk to infestation in bulbs of 'Simply Sweet' production is low.

Leeks. We had very strong insect pressure in both years, and risk of infestation is very high. The highest pressure was in 2019 (1,814 ALM in 280 plants and 1 plant in a control plot with 51 ALM). This was also apparent from the high values of percent damaged plants, which shows that adults were alighting on the plants and using their ovipositors to either insert eggs or create wounds. In 2018, foliar options performed better than using drip applications. This was consistent with results in 2017 (data not shown), and thus we no longer trialed drip applications in leeks. In 2018, the most effective options were Scorpion (as a foliar), Exirel, and Radiant (Table 1). In 2019, Off label Entrust (4 sprays) performed the best, followed by 2 sprays of Scorpion. Radiant (3 sprays) and Exirel (3 sprays) also performed well (Exirel would have performed really well except Rep 2 had really high ALM counts); surprisingly, AzaDirect did well too although it was the only treatment that was sprayed each week for a total of 5 sprays.

Table 1. Insecticide evaluation in leeks, 2018. Application dates were based on adult flight activity and label allowances. Treatments using drip were applied on 9/24, 10/4 and 10/24. All other treatments were foliar applications applied on 9/26, 10/2, 10/26, 10/31, and 11/4.

Product	Rate	% damaged plants ^{a,b}	Avg. no. ALM/plant ^{a,c}
	Fl oz/A		
Pyganic	32	82.5 a	2.725 a
Control	---	55 a	1.525 b
Verimark Drip	10	40 a	0.85 bcd
Azera	48	42.5 a	0.825 bc
Aza Direct	48	50 a	0.7 bcd
Scorpion Drip	10	35 ab	0.675 bcd
Scorpion Foliar	7	10 bc	0.15 cd
Exirel	20	10 c	0.1 d
Radiant	10	10 bc	0.1 d

a Means followed by the same letter are not significantly different ($P > 0.05$; Tukey's Studentized Range [HSD] Test; $n = 4$). Damage data were transformed using a $\sqrt{x + 0.001}$ function and insect count data were transformed using $\log(x + 1)$ function before analysis, but untransformed means are presented.

b A plant was considered damaged if it had ≥ 1 larva or ≥ 1 pupa.

c Included both larvae and pupae.

Table 2. Insecticide evaluation in leeks, 2019. Application dates were based on adult flight activity and label allowances. The 'Off Label Entrust' involved Entrust applied more than the seasonal allowable amount according to the label.

Treatment	Rate Fl oz/A	Spray Dates	Avg. no. ALM/plant	% damaged plants
Control	----	---	16.600 a	1.000 a
Entrust	6.0	25-Sep, 11-Oct	8.400 b	0.850 a
Radiant	10.0	25-Sep, 4-Oct, 11-Oct	5.125 bc	0.875 a
Exirel	20.0	25-Sep, 4-Oct, 11-Oct	5.025 bc	0.575 b
Aza-Direct	48.0	25-Sep, 4-Oct, 11-Oct, 21-Oct, 28-Oct	5.100 bc	0.775 ab
Scorpion	5.25	25-Sep, 11-Oct	3.875 c	0.875 a
Off Label Entrust	6.0	25-Sep, 4-Oct, 11-Oct, 21-Oct	1.225 c	0.525 b

(continued on page 21)

PVGA-PVMRP Sponsored Research

Coupling Host Resistance with the Evaluation of Biofungicides

Beth K. Gugino

Introduction

Biofungicides, whether based on microbial or biochemical active ingredients, are a primary tool for vegetable disease management in organic production and are becoming commonly used as a part of conventional fungicide programs due to reduced environmental and human safety risk as well as increased production flexibility in terms of reduced REIs and PHIs and potential market opportunities. In addition, due to the expedited EPA registration process, an increasing number are becoming available each year and marketed in trade magazines. For example, in a recent issue of *American Vegetable Grower*, five of the seven pest management advertisements were for biopesticides. In university trials, product efficacy is often evaluated on highly susceptible cultivars under conditions to promote high disease pressure as an "acid" test. Under these conditions when disease development is assessed regularly throughout the season, in general, biofungicides are most effective when disease pressure is low and then fail later in the season under higher levels of disease pressure. In these trials, the

use of biofungicides is less frequently leveraged with the use of host resistance which is the scenario when they are most likely to be effective. Trials coupling host resistance and conventional programs with biofungicides were conducted in 2018 and 2019 for powdery mildew on pumpkin, downy mildew on cucumber, early blight on tomato and in 2019 for late blight on tomato. The methods and results of the 2019 trials are presented and then compared with the 2018 trials are summarized in the summary/conclusion. All trials were conducted at The Pennsylvania State University Russell E. Larson Agricultural Research Center in Pennsylvania Furnace, PA in Centre County.

Pumpkin Powdery Mildew Trial

Methods: The field was plowed and fertilizer (N-P-K; 46-0-0 at 110 lb/A, 0-0-60 at 200 lb/A and 11-52-0 at 230 lb/A based on soil test results) was broadcast and incorporated on 9 May. Nineteen raised beds with 1.5-mil black-plastic mulch and a single row of drip-irrigation tape were formed in early Jun. Raised beds were 48-in. wide and 6-in. high and were laid on 13-ft centers. For each set of three rows, the center row was an untreated guard row and the two outer rows were treatment rows. On 6 Jun, pumpkin cvs. Howden (susceptible) and Bayhorse Gold (moderate resistance) were direct-seeded in designated plots, two seeds per hole, spaced 36-in. apart, one row per bed. Plants were thinned to one plant per hole or missing plants were replaced with transplants in early Jul so that each plot consisted of six plants. Plots were single rows, 20-ft long and separated in row by 22-ft of bare plastic. Fungicide treatments were replicated four times and arranged in a modified split-plot randomized complete block design with nine treatments being applied to cv. Howden and a subset of six treatments being applied to cv. Bayhorse Gold for a comparison of host resistance. Fungicide treatment was the whole block and cultivar the

(continued on page 22)

Managing Allium... (continued from page 20)

Also, as we obtained pupa from both types of work described above, we recovered two larval or pupal parasitoids: *Halticoptera circulus*, and *Chrysocharis oscinidis*, although at very low rates. This may have potential use for classical biological control.

Utility to growers. We now have a degree-day model we can use to alert growers when to expect the initiation of adult ALM activity in the spring, which we will begin deploying that in 2020. We anticipate providing a 1-2-week advance warning to growers of this initiation of flight activity. We now also have a record of how long to expect this flight activity to continue (5 to 7 weeks). Thus, growers who wish to apply insecticides, or deploy row covers, or deploy any other form of management directed against adults, will now have guidance on when to start and when to stop for the spring flight. Beyond this, we have made advances on determining temperature-dependent development rate functions that will aid in creating more refined degree-day models.

We also now have shown that 'Simply Sweet' production is at low risk of having ALM showing up in bulbs. More work should be done to clarify if this is due to (i) how ALM develop within onions, (ii) a host-choice behavior that is being influenced by the growth stage of the 'Simply Sweet' transplants during the time of spring ALM flight activity, or both.

We now have strong data to make recommendations of insecticides for controlling ALM, for both conventional and organic production systems. In conventional production systems, Scorpion (as a foliar), Exirel, and Radiant have been effective. Among the OCIA-labeled options, Entrust and Aza-Direct have provided control.



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Coupling Host... (continued from page 21)

sub-plot. Cucumber beetle was managed with an application of Admire 2F applied with a Solo backpack sprayer (mixed 5 ml/1gal then drench applied 5.0 fl oz/plant) on 14 Jun and squash bugs with an application of Lambda (3.8 oz/A) plus PBO (4.8 oz/A) on 7 Aug. Weeds were managed with an application of Medal EC (1.33 pt/A) plus Profine 75DF (0.5 oz/A) and Round-up (1.5 pt/A) on 4 Jun. On 27 Jun and 5 Jul, the trial was spot sprayed with Scythe and Round-up respectively and supplemental hand weeding was conducted throughout the season. Plots were fertigated regularly (N-P-K; 20-20-20 at 7 lb/A) and at increasing intervals as the crop matured. Fungicide applications were made using a tractor mounted, CO₂-powered sprayer with an offset-boom (R&D Sprayers, Opelousas, LA) traveling 2 mph and calibrated to deliver 52 gpa at 50 psi at the tank through six TX-18 hollow-cone nozzles on 20-in. centers on 25 Jul, 1, 8, 16 and 22 Aug. Powdery mildew severity was rated on a continuous scale of 0 to 100% based on the percentage of upper and lower leaf surface (rated separately) showing symptoms on six leaves per plot on 1, 10, 17, and 25 Aug and used to calculate area under the disease progress curve (AUDPC) values. Rainfall totals (in.) were 3.76, 2.83 and 3.16 for Jun, Jul, and Aug, respectively.

Results: Natural inoculum was relied upon and symptoms were first observed on 22 Jul. Disease pressure became severe, with the untreated control plots in both cultivars reaching near 100% disease severity on both the upper and lower

leaf surfaces by the end of the trial. There was a significant cultivar by treatment interaction so fungicide treatments were compared separately within each cultivar (Figure 1). Not surprisingly, disease was less severe on cv. Bayhorse Gold compared to Howden across all treatment comparisons. All treatments significantly reduced powdery mildew on both the upper and lower leaf surface however, the programs which included targeted fungicides (Vivando, Quintec and Torino) were most effective by providing 90 to 100% powdery mildew control. Inclusion of the biorational products LifeGard (a.i. *Bacillus mycooides* isolate J) or OxiDate 2.0 (a.i. hydrogen dioxide and peroxyacetic acid) did not improve efficacy of the standard commercial rotation of Vivando, Quintec and Torino tank-mixed with Bravo Weather Stik. The two biorational programs also effectively managed powdery mildew on the upper leaf surface (80 to 90% control) but were less effective on the lower leaf surface providing between 20 and 35% control compared to the untreated plots. This is not surprising since these products are protectants, so plant coverage is critical for them to be effective.

Cucumber Downy Mildew Trial

Methods: The field was plowed and fertilizer (N-P-K; 19-19-19 at 500 lb/A based on soil test results) was broadcast and incorporated on 9 May. Nineteen raised beds with 1.5-mil black-plastic mulch and a single row of drip-irrigation tape were formed in early Jun. Raised beds were 48-in. wide and 6-in. high and were laid on 9-ft centers. For each set of three rows, which were bordered by driveways, the center row was an untreated guard row and the outer rows were two treatment rows. Plots were single rows, 16-ft long and separated in row by 8-ft bare plastic buffers. The field was divided into two separate experiments but managed identically aside from individual plot treatments. On 7 Jun, trial 1 was direct seeded with cv. Darlington and trial 2 was direct seeded with cvs. Darlington (susceptible) and SV4719CS (intermediate resistance) two seeds per hole, spaced 24-in. apart, one row per bed in designated treatment plots. Guard rows of both trials were direct seeded with cv. Straight Eight. Fungicide treatments were replicated four times. Trial 1 was ranged in a randomized complete block design and trial 2 was arranged in a split-plot randomized complete block design with cultivar as the whole-plot and fungicide treatment as the sub-plot. Plots were thinned to one plant per hole or missing plants replaced with transplants in late Jun so that each plot consisted of eight plants. Cucumber beetles were managed with a soil application of Admire 2F applied with a Solo backpack sprayer (mixed 5 ml/1gal then drench applied 5.0 fl oz/plant) on 14 Jun and foliar applications of Baythroid (2.8 fl oz/A) on 2 Aug and Warrior (1.92 oz/A) on 14 Aug. Weeds were managed with an application of Curbit EC (3.0 pt/A), Profine 75DF (1 oz/A) and Round-up (1.5 pt/A) on 4 Jun that was activated with 0.5 in. of overhead irrigation on 5 Jun. On 27 Jun and 5 Jul, the trials were spot sprayed with Scythe and Round-up respectively and supplemental hand weeding was conducted throughout the season. Plots were fertigated regularly (N-P-K; 20-20-20 at 7 lb/A) and at increasing intervals as the crop matured. Fungicide applications were made using a tractor mounted, R&D CO₂ powered offset-boom sprayer traveling 2 mph and calibrated to deliver 52 gal/A at 52 psi at the tank through six TX-18 hollow-cone nozzles on 20-in. centers on 6, 14, 21 and 28 Aug. Downy mildew severity was rated on a con-

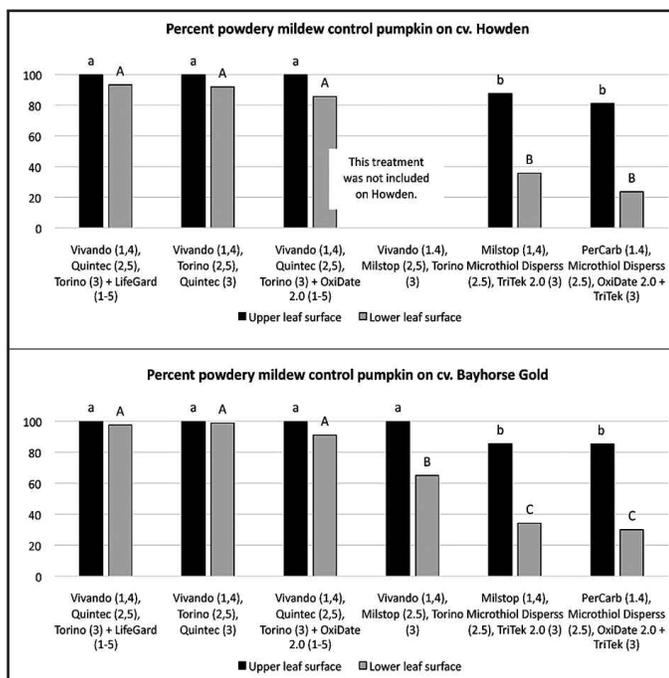


Figure 1. All fungicides were applied at the highest label rate. Vivando, Quintec and Torino were tank-mixed with Bravo Weather Stik (2.0 pt/A) plus Induce (0.125% v/v) when applied. The numbers in parentheses indicate the following fungicide applications dates: 1 = 25 Jul; 2 = 1 Aug; 3 = 8 Aug; 4 = 16 Aug and 5 = 22 Aug. As indicated by the letters at the top of the bars, programs containing Vivando, Quintec and Torino were most effective on the upper (black bars; lower case letters) and lower leaf surface (gray bars; upper case letters) for both cultivars Howden and Bayhorse Gold ($P < 0.05$).

(continued on page 23)

VEGETABLE PRODUCTION

Coupling Host... (continued from page 22)

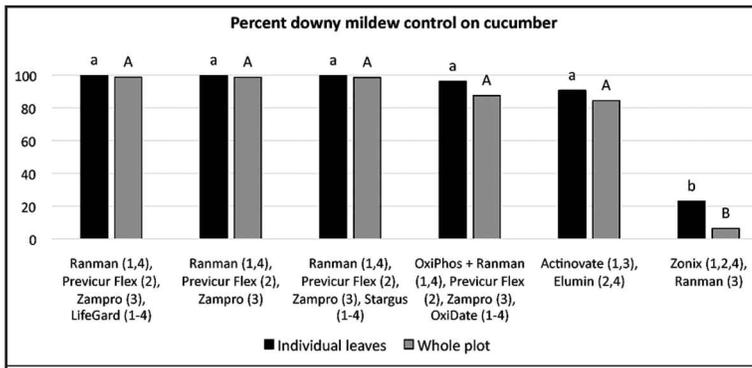


Figure 2. All fungicides were applied at the highest label rate. When applied Ranman, Previcur Flex, Zampro, Actinovate and Elumin were tank-mixed with Bravo Weather Stik (2.0 pt/A). The numbers in parentheses reflect the following fungicide applications dates: 1 = 6 Aug; 2 = 14 Aug; 3 = 21 Aug; and 4 = 28 Aug. As indicated by the letters at the top of the bars, all treatments except Zonix and Ranman were equally effective at managing downy mildew on individual leaves (black bars; lower case letters) and across the entire plot (gray bars, upper case letters) (P < 0.05). There was no difference between the cultivars Darlington and SV4719CS so the data was combined prior to analysis.

tinuous scale of 0 to 100% based on the percentage of the leaf surface showing symptoms on six leaves per plot on 17, 22, 26 Aug and 1 Sep. Whole plot disease severity was also assessed as the percentage of symptomatic leaves across the whole plot on each assessment date. Rainfall totals (in.) were 3.76, 2.83 and 3.16 for Jun, Jul, and Aug, respectively.

Results: Natural inoculum was relied upon and symptoms were first observed on 16 Aug. Disease pressure became severe, with the untreated control plots of both cultivars reaching nearly 100% disease severity when the trials were ended. This resulted in only four treatments applications so for several of the programs the complete program sequence scheduled was not applied. There was no statistical difference in disease development between the cvs. Darlington and SV4719CS, indicating that host resistance was ineffective in this trial, so the data was pooled prior to analysis. Including biopesticide(s) [LifeGard, Stargus (a.i. *Bacillus amyloliquefaciens* strain F727) and OxiDate 2.0 and OxiPhos 3.0 (a.i. hydrogen peroxide and phosphorous acid)] did not improve disease management over a commercial standard rotation of Ranman, Previcur Flex and Zampro tank mixed with Bravo Weather Stik; however this rotation was highly effective (nearly 100% control). Alternation between Actinovate (a.i. *Streptomyces lydicus* WYEC 108) and Elumin tank mixed with Bravo Weather Stik was statistically as effective as the programs including four applications of targeted fungicides. The program that started with two applications of Zonix (a.i. rhamnolipid surfactant) followed by Ranman was least effective. Had the trial last longer before the untreated controls reached 100% disease severity, applications of Ranman and Previcur Flex would have also been applied.

Tomato Early Blight Trial

Methods: The field was plowed and fertilizer (N-P-K, 46-0-0 at 185 lb/A and 11-52-0 at 145 lb/A based on soil test results) was broadcast and incorporated on 26 Jun. Tomato transplants cvs. Mountain Fresh Plus and BHN 964 were transplanted on 28 Jun. A starter fertilizer (N-P-K, 20-20-20 at 7 lb/A) along with

Admire 2F (1.0 pt/A) was applied in the transplant water. Each plot was 12-ft-long and separated by a 5-ft break within the row and 5-ft between row centers. Untreated guard rows, planted with cv. Gem (susceptible processing cultivar) on 26 Jun, separated each treatment row. Each plot was planted with 8 transplants spaced 18-in. apart. Treatments were replicated four times and arranged in a split-plot randomized complete block design with cultivar as the whole plot and fungicide treatment as the subplot. Weeds were managed with an application of Medal EC (1.5 pt/A) and Omni Metribuzin 75DF (0.33 lb/A) on 27 Jun and Scythe (5%) was spot sprayed between the rows on 31 Jul. Plots were fertigated regularly (N-P-K, 20-20-20, 7.0 lb N/A) through a single row of drip irrigation tape laid on the soil surface adjacent to the plants. Fungicide applications were made using a tractor mounted, CO₂-powered off-set-boom sprayer traveling at 3 mph and calibrated to deliver 30 gal/A at 32 psi through three TX-18 hollow-cone nozzles on 23, 31 Jul, 8, 16, 23, 30 Aug, 5 and 12 Sep. Unexpectedly, foliar late blight resulting from natural inoculum was observed on 10 Aug. Due to significant late blight disease pressure, the trial was reconfigured with three complete replicates and unneeded plots were burned down with Scythe (7%) on 14 Aug. The trial was maintenance sprayed with Ranman (2.75 oz/A) on 12, 19 Aug and 3 Sep, Orondis Opti A (3.0 oz/A) on 14 Aug and Zampro (14.0 oz/A) on 28 Aug and 11 Sep. Maintenance sprays were made with a R&D PTO Sprayer with five TX-18 nozzles. Early in the evening on 25 Jul, the guard rows were inoculated with a mix of three Pennsylvania
(continued on page 24)

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Coupling Host... (continued from page 23)

Alternaria solani isolates (1.5×10^4 spores/ml sprayed in three to four spots per 12 ft guard row using a hand-held Hudson sprayer). Foliar early blight severity was evaluated on 17, 25 Aug, 1, 8, and 14 Sep by estimating the percent of early blight symptomatic foliage across the whole plot and area under the disease progress curve (AUDPC) was calculated. Rainfall totals (in.) were 2.83, 3.16, and 1.44 for Jul, Aug and 1 to 14 Sep, respectively.

Results: Disease severity developed slowly reaching near 50% in the untreated control plots by the end of the season. The late blight fungicide program was effective at slowing disease progression, so it did not interfere with early blight disease assessments. There was no significant effect of cultivar on early blight disease development, so the data was pooled across cultivar Mountain Fresh Plus and BHN 964 prior to analysis. Aside from weekly applications of Stargus tank mixed with Badge X2, the majority of treatments significantly reduced early blight compared to the untreated controls. Replacing Bravo Weather Stik in the commercial standard program (alternating Bravo Weather Stik with Quadris tank mixed with Bravo Weather Stik) with the OMRI-listed fungicides, LifeGard or Double Nickel (a.i. *Bacillus amyloliquefaciens* strain D747) were equally as effective for managing early blight and replacing it with Champ statistically further reduced disease. The alternation of Fontelis and Regalia (a.i. extract of *Reynoutria sachalinensis*) tank mixed with Kocide 3000 was also equally as effective as Champ alternated with Quadris tank mixed with Bravo Weather Stik.

Tomato Late Blight Trial

Methods: Tomato seedlings were transplanted on 28 Jun. Each plot was 12 ft long with 8 plants spaced 18 in. apart. There was a 5-ft unplanted area between plots within the row and 5 ft between row centers. Guard rows planted with processing cv.

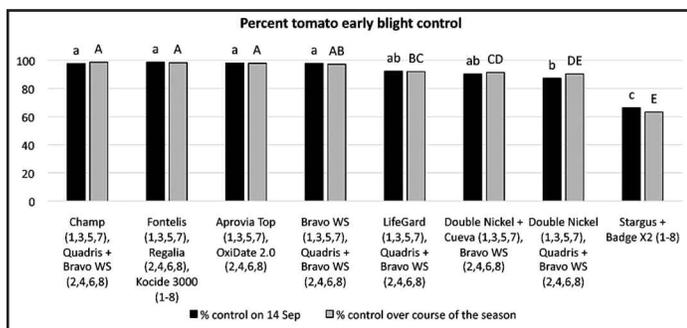


Figure 3. The fungicide rates are as follows: Champ (3.2 lb/A), Quadris (5 fl oz/A), Bravo Weather Stik (Bravo WS 2 pt/A), Fontelis (1 pt/A), Regalia (4 qt/A), Kocide 3000 (1 lb/A), Aprovia Top (13.5 fl oz/A), OxiDate 2.0 64 fl oz/50 gal water), LifeGard (4.5 oz/100 gal), Double Nickel (0.55 lb/A), Cueva (0.5 gal/A), Stargus (2.0 qt/25 gal) and Badge X2 2.0 lb/A). The numbers in parentheses reflect the following fungicide application dates: 1 = 23 Jul; 2 = 31 Jul; 3 = 8 Aug; 4 = 16 Aug; 5 = 23 Aug; 6 = 30 Aug; 7 = 5 Sep and 8 = 12 Sep. There was no significant difference in the level of disease control obtained on the cv. Mountain Fresh or BHN 964 so the data were pooled together within fungicide treatment across cultivar prior to data analysis. The black bars represent percent early blight disease control on 14 Sep ($P < 0.0001$) and the gray bars represent disease control over the course of the whole season calculated based on area under the disease progress curves ($P < 0.0001$).

Gem separated the treatment rows. Treatments were replicated four times in a randomized complete block design. Unexpectedly, foliar late blight lesions resulting from natural inoculum (US-23) were observed on 12 Aug therefore fungicide treatments were started immediately. Applications were made on 12, 20 and 28 Aug using a tractor-mounted, R&D CO₂-powered side boom sprayer calibrated to deliver 30 gal/A at 32 psi at the tank through one center and two drop TX-18 nozzles. To ensure uniform disease distribution, a mixture of four isolates of *Phytophthora infestans* clonal lineage US-23, at a concentration of 2.3×10^4 sporangia/ml were inoculated within the guard rows on 15 Aug using a hand-held Hudson sprayer. Foliar late blight severity was evaluated on 17, 22, 25 Aug and 1 Sep based on the percentage of the plot with symptoms. Rainfall totals (in.) were 2.83 and 3.16 for Jul and Aug, respectively.

Results: Disease pressure resulting from natural and artificial inoculum was severe with the untreated control plots quickly reaching 100% severity 20 days after observing first symptoms. Late blight is most effectively managed preventatively. Initiating the fungicide applications when symptoms were first seen, which was not the intention, likely led to an overall reduction in efficacy since the targeted fungicide program still resulted in 25% foliar disease severity. Despite this observation and with one exception, the application of some type of fungicide program significantly reduced late blight severity compared to the untreated control. Applications of Bravo Weather Stik in alternation with the biofungicides Stargus and Zonix were as effective as a straight Bravo Weather Stik program reducing disease severity by approximately 60% compared to the plots receiving no fungicide. The inclusion of LifeGard, a plant activator, as a tank-mix partner in a conventional commercial rotation of the targeted fungicides Tanos, Previcur Flex and Zampro or OxiDate 2.0 in a Bravo Weather Stik program did not improve the efficacy of the program which may have been the result of application timing. Late blight symptoms were not observed on

(continued on page 25)

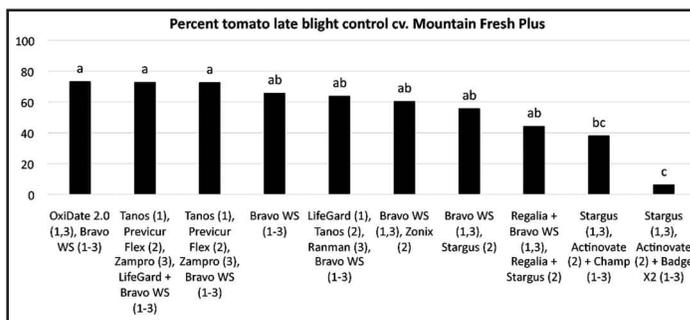


Figure 4. The fungicide rates are as follows: OxiDate 2.0 64 fl oz/50 gal), LifeGard (4.5 oz/100 gal), Zonix (0.8 oz/A = 500 ppm), Stargus (4.0 qt/25 gal), Regalia (4.0 qt/25 gal), and Badge X2 1.75 lb/A). All other products were applied at maximum labelled rates. The numbers in parentheses reflect the following fungicide application dates: 1 = 12 Aug; 2 = 20 Aug; and 3 = 28 Aug. Late blight did not develop on cv. Defiant so only data for cv. Mountain Fresh Plus is shown. The black bars represent the percent late blight disease control obtained from each fungicide program. Treatments were initiated after symptoms were observed and only 3 fungicide applications were made before the trial was ended due to 100% disease severity being reached in the untreated plots.

VEGETABLE PRODUCTION

Bell Pepper Bacterial Leaf Spot Resistance Cultivar Trial Results in New Jersey

Wesley Kline and Andy Wyenandt

Bacterial leaf spot (BLS) is caused by the pathogens, *Xanthomonas euvesicatoria*, *X. vesicatoria*, *X. perforans*, and *X. gardneri*, and is the second most important disease on bell and non-bell peppers in New Jersey. BLS has become more of a concern in New Jersey over the last ten to fifteen years. Early survey results from 2019 suggest *Xanthomonas euvesicatoria* is the most prevalent species found in pepper and tomato fields in the state. There are eleven (0-10) races of BLS identified in the United States; and past research has shown that all races are present in New Jersey today. The pathogen is favored by high humidity, hard driving rains, vigorous plant growth, infested stakes, and working in the field when plants are wet. In 2016,

Coupling Host... (continued from page 24)

cv. Defiant even under high disease pressure therefore only the data for cv. Mountain Fresh Plus is shown.

Conclusion/Summary:

From the trials conducted in 2018 and 2019, it is clear depending on the crop and disease, augmenting conventional fungicide programs with select biorational or OMRI-approved products can still provide the same or similar level of disease control as the conventional program. The inclusion of products such as LifeGard and Stargus tank-mixed with the conventional fungicide program, in general, did not provide an added benefit when their applications were timed using IPM principles rather than a regular calendar spray program. Products such as these as well as Regalia and Double Nickel that have modes of action characterized as boosting plant defenses may be more effective when used at planting and then throughout the season. For diseases such as powdery mildew on pumpkin and early blight on tomato, fungicide programs that included biorational products in program rotations were equally as effective at managing disease as the targeted/conventional fungicide program. Keep in mind, when evaluating the incorporation of new products into your own fungicide programs, it is important to not only review the research-based results available to help select the most promising biofungicides and OMRI-approved products but also consider conducting your own on-farm comparisons. The efficacy of fungicide programs can also be dependent on farm-specific factors so conducting a side-by-side comparison in conjunction with regular scouting to monitor disease development are important for successful disease management.

Dr. Gugino is with the Department of Plant Pathology and Environmental Microbiology at Penn State University. This research project was funded in part by PVGA and the Pennsylvania Vegetable Marketing and Research Program.

Table 1. Seed sources and disease resistance as report by the company.

Variety	Company	Disease Resistance ^a
Antebellum	Seminis	HR: Tm: 0, IR: TSWV, Xcv 1-10
Aristotle	Seminis	HR: PVY: 0, Tm: 0; Xcv: 0-3, 7, 8
Autry	Seminis	HR: Tm: 0, IR: TSWV, Xcv: 1-10
Boca	Seedway	HR: Xcv 1-10; IR: TSWV
Labelle	Seedway	IR: Xcv 1-10
Galleon	United Genetics	HR: Xcv 1-10
Green Flash	United Genetics	HR: TSWV, Xcv: 1-10
Green Machine	Seminis	HR: Tm: 0; IR: TSWV; Xcv 0-10
Mariner	United Genetics	HR: Xcv: 1-10
Mercer	Sakata	HR: TMV:0; Xcv 0-3, 7-8; IR: Pc
Ninja	Sakata	HR: TMV; IR: Xcv: 1-10
Outsider	Syngenta	HR: TSWV; Xcv: 1-10
Paladin	Syngenta	HR: Pc
Placepack	Enza Zaden	HR: PVY: 0-1; Tm: 0; Xcv: 1-10
Playmaker	Seminis	HR: Tm: 0; Xcv: 0-10; IR: Pc
Provider	Enza Zaden	HR: PVY: 0-1; Tm: 0; Xcv: 1-10, IR TEV
Prowler	HM Clause	IR: TSWV: 0; IR: Xcv 1-10
Samurai	Sakata	HR: TMV; IR: Xcv: 1-10
Skyhawk	HM Clause	IR: Xcv: 1-10
Standout	Syngenta	HR: TMV; TSWV; Xcv: 1-10
Turnpike	Seminis	HR: Tm; Xcv: 0-5, 7-9; IR: Pc
FPP 2862	Sakata	
FPP 2866	Sakata	
SP 2622	Sakata	
SP 2628	Sakata	
1819	Seminis	HR: Xcv: 0-5; IR: Pc
3255	Seminis	HR: Tm: 0; IR: Xcv: 1-10
3964	Seminis	HR: Xcv: 0-4, 7-9; Tm: 0; IR: CMV
7140	Seminis	HR: Xcv: 0-10; Pc
7331	Seminis	HR: Xcv: 1-10; IR: Pc
9325	Seminis	HR: Xcv: 1-10

^aPVY = Potato virus Y; TEV = Tobacco Etch Virus; TMV = Tobacco Mosaic Virus; TSWV = Tomato Spotted Wilt Virus; Tm = Tobamovirus; Xcv = Bacterial leaf spot race resistance; CMV = Cucumber mosaic virus; Pc = *Phytophthora capsici*, with HR = Highly resistant; IR = Intermediate resistance

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VEGETABLE PRODUCTION

Bell Pepper Bacterial... (continued from page 25)

Table 9. Extra-Large, Large, and Medium Sized Fruit (in 28 Lb. Boxes per Acre); Percent Marketable Yield, and Total Marketable (Boxes per Acre) for all Harvests at RAREC, 2019, Bridgeton, NJ.

Variety/Line	XL	L	M	% Marketable	Total Marketable
Turnpike	85.25 ab ^x	674.20 a	254.26 b-f	92.80 a-e	1013.70 a
3964	103.12 a	593.20 abc	261.30 b-f	95.23 a-d	957.60 ab
Aristotle X3R	13.78 def	595.30 ab	269.12 b-e	91.10 a-e	878.20 abc
Mercer	13.83 def	525.50 a-d	332.73 ab	92.51 a-e	872.10 abc
Outsider	65.93 bc	487.70 a-e	272.75 a-e	94.51 a-d	826.40 a-d
1819	36.41 cde	486.20 a-e	287.20 a-d	94.70 a-d	809.80 a-e
3255	5.65 def	416.30 b-h	382.24 a	97.54 a	804.20 a-e
SP2622	16.73 def	456.90 a-f	304.24 a-d	97.33 a	777.90 a-f
Labelle	21.49 def	402.40 b-i	331.17 abc	91.55 a-e	755.10 a-f
FPP2862	39.00 cd	448.70 a-g	243.54 b-f	96.27 ab	731.20 a-f
SP2628	7.87 def	417.90 b-h	274.05 a-e	97.19 a	699.80 a-g
Green Machine	16.78 def	392.40 b-j	267.00 b-e	92.95 a-e	676.20 b-g
Playmaker	22.79 def	453.10 a-f	199.36 d-h	89.36 cde	675.20 b-g
Prowler	13.57 def	402.10 b-i	257.47 b-f	90.14 b-e	673.10 b-f
Antebellum	11.08 def	363.10 c-j	273.48 a-e	95.84 abc	647.60 b-g
Green Flash	32.11 c-f	335.60 d-j	248.20 b-f	87.25 ef	615.90 c-h
Boca	16.73 def	341.90 d-j	247.27 b-f	95.31 a-d	605.90 c-h
Autry	30.40 def	317.80 d-j	256.64 b-f	93.38 a-e	604.90 c-h
7140	23.00 def	283.00 e-k	276.74 a-d	86.83 ef	582.70 c-h
Samurai S10	15.80 def	290.70 e-k	274.72 a-d	95.17 a-d	581.20 c-h
Standout	34.08 c-f	324.70 d-j	221.84 c-g	94.83 a-d	580.60 c-h
FPP2866	8.08 def	306.10 d-k	199.31 d-h	95.62 abc	513.40 d-i
Skyhawk	5.18 def	241.80 f-l	241.83 b-f	88.43 d-f	488.80 e-i
9325	11.34 def	217.60 g-l	235.82 b-g	93.49 a-e	464.80 f-i
7331	8.34 def	198.50 h-l	254.47 b-f	93.63 a-e	461.30 f-i
Galleon	8.55 def	217.30 g-l	163.62 e-h	92.92 a-e	389.40 ghi
Provider	2.64 ef	166.00 jkl	209.46 d-h	93.40 a-e	378.10 g-j
Ninja S10	2.75 ef	164.80 j-l	154.66 fgh	82.06 f	322.20 hij
Mariner	8.44 def	181.20 i-l	107.84 hi	73.76 g	297.50 hij
Placepack	0.00 f	75.70 k-l	125.65 ghi	87.40 ef	201.40 i-j
Paladin	0.00 f	28.60 l	32.68 i	91.79 a-e	61.30 j
LSD	34.99	231.73	110.72	6.90	322.22

^xWithin columns, means followed by different letters are significantly different

XL = Extra-Large; L = Large; M = Medium

Rating Scale where:

0=No symptom development

1=Few leaf spots present, strong plant growth and canopy

2=Major leaf spotting and marginal necrosis present, good growth

3=Heavy leaf spotting and leaf drop due to BLS, re-growth good

4=Heavy defoliation due to BLS, stunted growth, very little regrowth



Table 10. Bacterial Leaf Spot Ratings at RAREC in 2019.

Cultivar/Line	Mean ^x	
	Jul 17, 2019	Sep 9, 2019
9325	1.50	1.25
Autry	1.50	0.88
Placepack	1.50	1.33
Provider	1.50	1.50
Skyhawk	1.50	1.38
3255	2.00	0.75
7331	2.00	0.75
Green Machine	2.00	1.00
Labelle	2.00	1.13
Outsider	2.00	1.13
Samurai S10	2.00	2.00
Standout	2.00	2.00
Antebellum	2.25	1.50
Aristotle X3R	2.50	3.00
Green Flash	2.50	3.00
Mariner	2.50	1.75
Prowler	2.50	1.38
Ninja S10	2.75	2.00
7140	3.00	2.25
Boca	3.00	1.25
FPP2862	3.00	1.38
Turnpike	3.00	3.50
1819	3.25	3.75
3964	3.25	3.00
FPP2866	3.25	2.25
Mercer	3.25	3.13
Galleon	3.50	2.75
Playmaker	3.50	1.38
SP2622	3.50	1.13
SP2628	3.75	0.88
Paladin	4.00	4.00

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VEGETABLE PRODUCTION

Bell Pepper Bacterial... (continued from page 26)

Rutgers started screening cultivars and advanced breeding lines with resistance to all races (often referred as X10R resistance) of bacterial leaf spot. The 2019 trials were done at the Rutgers Agricultural Research and Extension Center (RAREC) near Bridgeton, New Jersey and in a grower's field in Vineland, New Jersey. Plots were established on black plastic mulch with one drip line between double rows with distance between plants at 18 inches in double rows and 6 ft. between beds center to center at RAREC and 5.3 ft in Vineland. The plots (18 plants/plot) were transplanted June 5th at RAREC and May 30th in Vineland. All cultural practices such as staking/tying, fertilization and pest management were carried out by the grower in Vineland. The RAREC trial was not staked. Plots in each location were arranged in a randomized complete block design with four replications. BLS was not observed at the Vineland location in 2019, except on the cultivar 'Paladin', thus plots were not rated for BLS development. Plots at RAREC were rated twice, once on July 17 and on September 9 (Table 10). At both locations, the cultivar 'Paladin' (no BLS resistance) was the susceptible control and 9325 (race 1-10 resistant) the resistant control. At RAREC, all entries showed some BLS development, but 'Paladin' consistently had the highest BLS rating. Most entries had less BLS development during the second rating date, except 'Paladin'. There was symptom development on fruit on

either rating date at RAREC. Entries, seed company and reported disease resistance are listed in Table 1. Tables 2 and 3 summarizes the monthly minimum, maximum and average temperatures and rainfall for the season. The entries were harvested 4 times starting 62 days after transplanting from July 31 to September 5 in Vineland and 5 times starting 75 days after transplanting from August 19 to October 11 at RAREC. Peppers were graded based on weight (extra-large >0.49 lbs., large 0.33 – 0.49 lbs., medium 0.25 – 0.32 lbs., culls >0.25 lbs.). Harvest data is summarized by date and total harvests for RAREC (Tables 4-9) and Vineland (Tables 11-15). Fruit quality for diameter and length, wall thickness and number of lobes are presented in Table 16. See Appendix 1 for images of all cultivars. Overall yields were higher at the Vineland location even with one less harvest in 2019. '3964' had the highest marketable yield in Vineland, but was not statistically different from '1819', 'Antebellum', 'Turnpike', '7140', 'Prowler' or 'Aristotle'. At RAREC, 'Turnpike' had the highest marketable yield with '3964', 'Aristotle', 'Mercer', 'Outsider', '1819', '3255', 'SP2622', 'Labelle', 'FPP2862' and 'SP2628' not significantly different from it.

Dr. Kline is with Rutgers Cooperative Extension and Dr. Wyenandt is with the Rutgers Agricultural Research and Extension Center in Bridgeton, NJ. From Rutgers Cooperative Extension, Plant and Pest Advisory, <https://plant-pest-advisory.rutgers.edu/wp-content/uploads/2020/02/BLS-Final-Report-2019.pdf>

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VEGETABLE PRODUCTION

Bell Pepper Bacterial...
(continued from page 27)

Table 15. Extra-Large, Large, and Medium Sized Fruit (in 28 Lb. Boxes per Acre); Percent Marketable Yield, and Total Marketable (Boxes per Acre) for all Harvests in 2019, Vineland, NJ.

Variety/Line	XL	L	M	% Marketable	Total Marketable
3964	224.93 a ^x	798.70 ab	98.52 gh	94.82 abc	1122.20 a
1819	120.49 bc	857.60 a	125.14 c-g	94.00 a-e	1103.20 a
Antebellum	115.16 bc	779.90 a-d	147.84 b-g	95.74 ab	1042.90 ab
Turnpike	131.01 b	794.40 abc	108.36 fgh	97.42 a	1033.80 ab
7140	45.84 ef	762.70 a-e	109.78 fgh	91.42 a-f	918.30 abc
Prowler	17.95 ef	692.00 a-f	190.20 abc	88.59 a-h	900.10 a-d
Aristotle X3R	107.53 bcd	677.90 a-g	112.71 efg	93.27 a-e	898.10 a-d
Skyhawk	31.26 ef	672.60 a-h	131.74 b-g	86.76 b-i	835.60 b-e
Provider	34.24 ef	609.90 b-i	179.54 a-d	88.30 a-h	823.70 b-e
Mercer	45.84 ef	609.30 b-i	147.44 b-g	88.33 a-h	802.60 b-e
Boca	107.13 bcd	560.60 d-j	132.18 b-g	85.98 c-i	799.90 b-e
Green Machine	18.25 ef	594.90 b-i	138.00 b-g	92.44 a-f	751.10 c-f
Standout	38.11 ef	562.70 c-j	142.80 b-g	88.83 a-h	743.60 c-f
FPP2862	34.98 ef	525.10 f-j	172.44 a-f	91.04 a-f	732.50 c-f
9325	15.41 f	519.10 f-j	148.28 b-g	91.97 a-f	682.80 c-g
SP2628	10.18 f	540.60 e-j	122.69 d-g	92.76 a-e	673.50 c-g
Outsider	72.79 cde	544.90 e-j	45.10 hi	89.31 a-h	662.80 c-g
Labelle	48.04 ef	487.20 f-j	126.02 b-g	83.23 f-i	661.20 c-g
Autry	54.84 def	498.10 f-j	105.59 gh	94.67 abc	658.50 c-g
3255	14.28 f	444.90 g-k	190.20 abc	96.72 a	649.40 d-g
FPP2866	5.77 f	490.30 f-j	141.55 b-g	84.91 d-i	637.70 d-g
Playmaker F	12.57 f	457.50 g-j	160.97 a-g	90.84 a-f	631.00 efg
SP2622	18.44 ef	449.10 g-k	163.34 a-g	81.32 ghi	630.90 efg
7331	7.92 f	441.30 h-l	178.36 a-e	94.24 a-d	627.60 efg
Ninja S10	0.00 f	393.00 i-m	223.91 a	89.98 a-g	616.90 e-h
Samurai S10	7.58 f	390.20 i-m	191.72 ab	91.84 a-f	589.50 e-i
Green Flash	2.74 f	358.60 j-m	163.24 a-g	80.18 hi	524.60 f-i
Playmaker	7.48 f	347.70 j-m	163.00 a-g	78.71 i	518.20 f-i
Placepack	5.28 f	353.40 j-m	101.70 gh	85.08 d-i	460.40 g-j
Galleon	5.43 f	211.00 lm	139.86 b-g	84.74 e-i	356.30 hij
Mariner	10.37 f	216.00 lm	113.86 d-g	51.16 j	340.20 ij
Paladin	13.65 f	168.70 m	32.14 i	95.10 abc	214.50 j
LSD	56.85	233.42	66.36	3.66	262.91

^xWithin columns, means followed by different letters are significantly different
XL = Extra-Large; L = Large; M = Medium

Table 16. Cultivar, Average Fruit Size Ratio (Length/Width), Wall Thickness, and Average Number of Lobes at RAREC and Vineland 2019.

Variety	RAREC			Vineland		
	L/W	Wall Thickness (mm)	No. Lobes	L/W	Wall Thickness (mm)	No. Lobes
1819	0.89	5.65	4.00	1.15	5.88	3.60
3255	1.00	6.45	3.80	0.90	5.12	3.75
3964	1.06	6.06	3.60	1.29	6.15	3.30
7140	0.93	5.97	3.80	1.24	5.55	3.30
7331	1.00	6.17	3.80	1.09	5.70	3.80
9325	0.84	5.73	3.40	1.04	5.03	3.10
Antebellum	0.95	6.50	4.00	1.22	6.00	3.60
Aristotle X3R	1.12	5.66	3.50	1.31	6.14	3.20
Autry	0.78	5.93	3.83	1.08	5.55	4.00
Boca	0.88	6.23	4.20	1.03	6.48	3.50
FPP2862	0.96	5.77	4.00	0.96	5.48	3.50
FPP2866	0.81	5.95	4.10	0.87	5.01	4.10
Galleon	1.02	6.27	3.88	1.21	5.81	3.80
Green Flash	1.06	6.22	3.90	1.09	5.27	4.00
Green Machine	0.93	5.97	4.10	1.08	5.44	3.40
Labelle	0.87	5.83	4.00	1.14	5.20	3.40
Mariner	1.01	6.50	0.00	1.02	5.86	3.60
Mercer	0.92	5.69	3.60	1.18	5.87	3.20
Ninja S10	0.85	5.40	4.00	1.05	5.45	3.67
Outsider	0.98	6.39	3.70	1.19	5.85	4.00
Placepack	-	-	-	1.02	6.73	3.60
Playmaker	0.95	5.95	3.50	1.14	5.88	3.50
Provider	0.95	5.73	3.40	1.09	6.37	3.90
Prowler	0.97	5.93	3.40	1.03	6.41	3.70
Samurai S10	1.01	6.04	3.70	1.04	5.70	3.29
Skyhawk	0.74	5.72	3.50	0.92	6.14	3.50
SP2622	0.86	5.87	4.30	0.86	4.97	4.60
SP2628	0.86	5.92	4.20	1.22	4.82	3.20
Standout	0.83	6.23	3.80	0.95	4.99	3.70
Turnpike	1.04	6.26	3.70	1.38	6.30	3.30

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VEGETABLE PRODUCTION

Bell Pepper Bacterial... (continued from page 28)

Appendix 1. Images of cultivars and breeding lines taken at harvest two on 9/29/2019 at Vineland, NJ.



GREENHOUSE PRODUCTION

Sanitation is Important in Transplant Production Houses

Jerry Brust

By now almost all growers have started transplant production or have hired someone else to grow their transplants. With all of the important things that go into transplant production one of the sanitation factors that is somewhat neglected is weed control. Figure 1 shows the outside edge of a high tunnel production house in February. The grower was getting ready to drop seed in just a few days after they cleaned up the house from the fall growing season. This particular grower had been having intermittent problems with thrips (and consequently tomato spotted wilt virus) and two spotted spider mites in their production house. The chickweed you see on the outside and more on the inside at the base of the high tunnel was harboring a few thrips and a few mites. All the thrips and mite holdovers from the fall were female and would be ready to feed and lay eggs in the next week. The grower was cleaning up the weeds and debris from last fall five days before they were to start their seedling trays. This is not enough time to eliminate the pest problems that were on the overwintering weeds. Three and probably four weeks would have been much better to greatly reduce the mite and thrips populations. Not only can chickweed harbor these two major insect and mite pests, but the weed also can act as a host for tomato spotted wilt virus along with other weeds such as Canada thistle, ragweed, redroot pigweed, nightshade, chicory, yellow sweet and white clovers, phlox and many others. This makes it imperative that growers control their weeds weeks, if not months, before they drop seed for their vegetable or flower transplants. This includes controlling the weeds throughout the production period. Often times growers become very busy this time of season and neglect managing new weed problems as they arise (Fig. 2). I know we are always asking you to control your weeds in your vegetable fields, which is a difficult thing to do, but it is much more manageable to control weeds in a high tunnel or greenhouse over a period of a few months.

Besides insects and viruses weeds also can harbor fungal and bacterial diseases. One of the worst diseases and one that is becoming much more of a consistent problem in our tomato fields is bacterial spot caused by four species of *Xanthomonas* (Fig. 3). I think part of the reason bacterial spot has become such a problem is that it establishes itself in the field early in the season. This may be due to several factors such as weeds in the field harboring bacterial spot



Figure 2. Weeds growing alongside transplants.

disease, *Xanthomonas* strains with copper resistance and by transplants being infected. Transplants can become non symptomatic carriers of bacterial spot. Studies have found that a tray with one seedling that is infected can result in several plants in that tray and surrounding trays having *Xanthomonas* spp. bacteria on them but with no infection. It would be impossible to know which plants were carriers and which were not. Bacterial spot is so prolific a disease that one infected seed in 10,000 can start an epidemic in the field. To help reduce any chance of bacterial spot in your transplants, good sanitation practices need to be used in the production area and seeds should be hot-water treated, which will eliminate the bacteria from the surface of the seed and more importantly from within the seed.



Figure 3. Bacterial spot on a tomato leaf



Figure 1. Chickweed present inside and outside a high tunnel being prepared for transplant production.

Dr. Brust is the IPM Vegetable Specialist at the Univ. of Maryland. From the **Weekly Crop Update**, Univ. of Delaware Coop. Extension, Vol. 27, Issue 3, April 12, 2019.

NEWS

CLASSIFIED

Directors Meet... (continued from page 13)

assessment dollars allocated for research by the Pennsylvania Vegetable Marketing and Research Program for a total of \$80,000 available for vegetable research funding. The proposals received requested more than \$105,000.

The Board reviewed the state and federal research priorities. They voted to remove the Waters of United States priority since that concern has been dealt with but to replace it with one addressing storm water runoff regulations.

It was reported that Penn State Extension is currently advertising for two extension educator positions that will focus on vegetable production – one in Butler County and one in Franklin County. The University will also begin charging research project budgets a uniform land use fee of \$500 per acre for land at the Rock Springs research farms.

The next meeting of the Board will be held on Wednesday March 18, in conjunction with the Association's Legislative Visitation Day in the Capitol in Harrisburg.

State News Briefs (continued from page 14)

Management Assistance Program (DMAP), which would allow hunters to purchase up to four DMAP permits per property, up from the current limit of two, except in areas to be determined by the Game Commission.

All three proposals are subject to final approval at the next quarterly meeting scheduled for April 6 and 7. The commission will be accepting public comment on all of the proposals before the meeting.

From *Penna. Agricultural Alliance Issues Update*, Penna. Farm Bureau, February 2020.

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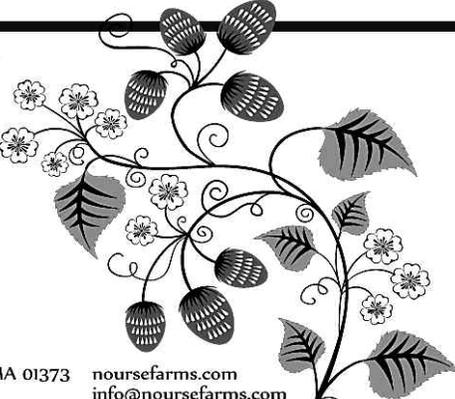
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An association of commercial vegetable, potato and berry growers.

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State Legislative Priorities for 2020

The Pennsylvania Vegetable Growers Association is an association of commercial vegetable, potato and berry growers with 950 members representing an industry that annually produces crops valued at over \$147 million on 3,950 farms with 50,000 acres of farmland across the Commonwealth.

Unemployment Compensation for H-2A Labor – Unlike Pennsylvania, many states follow the Federal guidelines that clearly state H-2A employers are exempt from unemployment contributions for H-2A workers. The H-2A program is already very expensive and employers are required to provide a 75% guarantee of the workers' contracted wages. Moreover, the employees usually are not in the country long enough to collect any benefits. We strongly support HB 2032 which would exempt H-2A employers from making unemployment contributions on H-2A wages.

Penn State Agricultural Extension and Research Appropriations - Funding for Penn State Extension and Research is critical to maintain agriculture's cutting edge and should be continued at least at current levels. The vegetable and berry industries have given over \$1.97 million to research in the past 31 years, but we need the extension and research infrastructure that is supported by state appropriations.

Agritourism Liability Limitation - Many of our growers have found that adding agritourism activities to their on-farm markets greatly increases their ability to attract more customers for their farm products. However, it also has sometimes opened them up to frivolous lawsuits. We strongly support HB 1348 which enables farmers to decrease their liability exposure from agritourism activities.

Broadband Internet Access – High-speed broadband internet access has become a necessary utility for small businesses like our members' farms to be competitive in today's marketplace. The state should make every effort to accurately identify those areas of the state that do not have general access to such high-speed service so that resources can be focused on alleviating this deficiency.

Farmers' Market Nutrition Program - Both the Women, Infant and Children (WIC) and low-income senior citizens coupons have greatly increased farm market sales while providing nutrition to needy Pennsylvanians.

Pennsylvania Agricultural Surplus Program (PASS) – This Program provides growers with some compensation to help cover harvesting and packing costs of products that they donate to the food bank system – products that they might otherwise have left unharvested in the field. We would encourage increased funding of this program.

2020 Policy Resolutions

The Members of the Association recently adopted these additions to our Policy Resolutions putting the Association on record as:

State Resolutions

1. Urging the Farm Service Agency (FSA) State Committee to actively inform growers of the differences between “Jack-O-Lantern pumpkins” and “Howden pumpkins” for the purposes of reporting their pumpkin acreages to FSA and to explain the possible consequences of how they report their pumpkin acreages.
2. Opposing the closing of Regional Department of Agriculture Offices.
3. Supporting online enrollment or reenrollment of lands for DMAP and Red Tag programs.
4. Supporting the increase of Red Tag and DMAP permits to 4 per hunter per property enrolled in the respective programs.
5. Supporting a requirement for PennDOT to notify CDL drivers and commercial truck owners of Spotted Lanternfly regulations and penalties with their license and registration renewal.
6. Supporting a 50-mile radius of operation from the farmer's farm(s) for farm vehicles with the Type B and Type C biennial certification of exemption.
7. Supporting research funding on the effect of new insecticides, seed treatments and diseases on honeybees.
8. Supporting the exemption of H-2A workers' wages from state unemployment contributions.
9. Supporting the state funding of the review of any mandated DEP permit instead of by the permit holder.
10. Supporting the elimination of all permit fees for farmers to repair or replace non-public agricultural culverts, pipes or bridges.
11. Supporting a requirement for government agencies and authorities levying Stormwater Management Fees to offer offsetting credits to those fees for the following:
 - a) Each acre of compliance under each of the following: an NRCS or County Conservation District approved Conservation Plan, an Erosion and Sediment Plan, an Act 38 Nutrient Management Plan, and/or an implemented NRCS Comprehensive Nutrient Management Plan.
 - b) Each approved Manure Management Plan.
 - c) Erosion controlling structures including diversion ditches, grass waterways, stone waterways and terraces.
 - d) NRCS or County Conservation District approved manure holding structures.
 - e) Each acre of forested or wooded acres.
 - f) Positive ratios of pervious to impervious areas.”
12. Opposing any fee, tax or ordinance based on stormwater runoff.

State and Federal Resolutions

1. Supporting increased efforts by the state and federal governments to facilitate broadband internet access to all areas of the state.
2. Supporting the exemption of Pennsylvania agriculture from Municipal Separate Storm Sewer System (MS4) requirements mandated under the Federal Clean Water Act, and the funding by the state of all mandated Municipal Separate Storm Sewer System (MS4) implementation practices.
3. Supporting the use of water quality monitoring in local watersheds for the verification of theoretical data in the Chesapeake Bay Model.
4. Supporting the use of genetic engineering of potatoes and the modern, enhanced potato breeding methods that enable breeders to improve potato varieties much sooner than traditional breeding methods.

The Association's full Policy Resolutions can be found at <https://www.pvga.org/representation/>.



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Immigration and Farm Labor Reform – Our members regularly list immigration reform and labor availability as one of their main legislative concerns. Our growers need an affordable and dependable labor supply to stay in business. We need immigration reform that creates a legal labor force with reasonable verification requirements. A mandatory E-verify bill without a workable agricultural guest program would be disastrous for American agriculture.

Card Check – We are opposed to the elimination of the secret ballot for employees in deciding on union representation and to mandatory arbitration to resolve failed union and employer contract negotiations.

Environmental

Municipal Separate Storm Sewer System Regulations – Local governments are imposing burdensome costs on Pennsylvania farms as they seek to cover their costs of complying with this federal mandate.

Food Safety

Good Agricultural Practices, Produce Traceability – We support safe food production systems, but these mandates should not be so burdensome so as to prevent our small growers from competing in the marketplace for negligible improvement in food safety.

Appropriations

Specialty Crop Funding – The Specialty Crop Block Grants have been a major source of funding for our industry's promotion and research activities. These funds need to be maintained.

Land Grant Agricultural Research and Extension Funding – Federal funding of these key agricultural support programs has continued to dwindle. Farmers depend on the research and extension activities of their land grant institutions.

Nutrition Funding - The Farmers' Market Nutrition Program for Women, Infant, Children clients and senior citizens is of great benefit to both of these groups and our growers.

Health Care Costs

Health Insurance - Most of our members are self-employed and/or small employers. Spiraling health insurance costs threaten their ability to expand or even maintain their operations.

Taxes

Business Depreciation Deduction Limit (Section 179) – This limit needs to remain at least at \$500,000.

Inheritance Tax – This tax should be eliminated.

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7. Supporting the use of water quality monitoring in local watersheds for the verification of theoretical data in the Chesapeake Bay Model.
8. Supporting the use of genetic engineering of potatoes and the modern, enhanced potato breeding methods that enable breeders to improve potato varieties much sooner than traditional breeding methods.

Federal Resolutions

1. Supporting farm labor reform to ensure growers with access to an adequate legal labor force but opposing the Farm Workforce Modernization Act in the form passed by the House of Representatives.
2. Supporting a requirement for the operator of the UAS to gain the written consent of the landowner and/or farm operator if the UAS will be operating above the landowner's private property.
3. Supporting a requirement by the U.S government, as part of the private-government relationship with the National Crop Insurance Services, (NCIS), that the NCIS Board of Directors include at least one active farmer from each of the five major geographical regions of the United States.

The Association's full Policy Resolutions can be found at <https://www.pvga.org/representation/>.