



Don't Miss the 2022 Mid-Atlantic Fruit and Vegetable Convention

The 2022 Mid-Atlantic Fruit and Vegetable Convention educational program as always offers three days of educational sessions for vegetable, potato, berry, and fruit growers and marketers plus a large industry trade show. Dr. David Kohl be this year's keynote speaker – addressing “Roller Coaster Economics and the Management Mindset”. Don't miss out on the following opportunities at the 2022 Convention which runs from February 1 to 3 at the Hershey Lodge in Hershey.

Pre-Convention Workshops and Farm Market Tour

Basic Floriculture Greenhouse School

\$65.00 includes lunch and handout materials

An all-day school covering marketing, crop scheduling, water quality, growing media, fertility, disease and insect pest management, biopesticides and plant variety selection. Speakers are Steven Bogash with Marrone BioInnovations, Thomas Ford, Krystal Snyder, and Sinclair Adam with Penn State Extension; Carol Glenister with IPM Laboratories; and Troy Buechel with Pro-Mix.

Hemp Production

\$50 includes lunch

An all-day workshop on hemp production in Pennsylvania. Topics will include the business of hemp; hemp breeding; day-neutral and photoperiod sensitive variety and growing trials; nutrient management; disease and insect pest management; and harvesting, curing, storage and packaging hemp. Speakers include Dr. Lawrence Smart from Cornell University; Dr. Francesco Di Gioia and Dr. Alyssa Collins from Penn State; Sage Dennis from Fertrell; Steven Bogash from Marrone BioInnovations and others.

The Practical Side of Farm, Business, and Estate Transition

\$50.00 includes lunch and PA FarmLink Transition Workbook
9:00 a.m. - 3:00 p.m.

Join several Penn State Extension Educators from the Ag/Farm Transition Team for this day-long farm business transition workshop series. The sessions are for farm/ag business owners and operators of all levels. Anticipated audiences are folks ranging from pre-retirement, thinking about transitioning, or ready to transfer the estate and exit the agricultural industry and retire (or semi retire) all the way to people who are just getting into the industry in general. Educators will be discussing various farm transition and succession topics and strategies throughout the sessions, from Extension and partner organizational research. Speakers include: Christie Powell, Lynn Kime, Anne Miller, Paula Ledney, John Wodehouse, and Samantha Gehrett from Penn State Extension.

Conducting and Analyzing On-Farm Research

\$20 no lunch

2:00 – 5:00 p.m.

Please join the Young Grower Alliance for their preconference workshop with speakers Dr. Rich Marini and Mr. Lynn Kime. Rich and Lynn will be highlighting how to design and analyze on-farm research by growers, for growers. If your operation has ever used one or more of their fields to trial new fertilizers, pesticides or crop management methods, this workshop will allow you to better determine the success of those trials in the future. You will learn good trial design practices and some of the ways to compare the results between trial blocks, examining the economic impacts of those results.

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NEWS



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Directors Meet in State College

The PVGA Board of Directors held their “fall” meeting on Tuesday, December 7, at Toftrees Resort in State College. This meeting is preceded by meetings of the various PVGA committees which make recommendations to the Board for the Association’s activities for the coming year.

For several years these committee meetings were held in-person the day before the Director’s meeting but like last year, this year the committee meetings were all held virtually the week before. While last year they were held virtually due to concerns about the pandemic, this year the Board decided to hold the committee meetings virtually simply to save money. Since the Association pays the mileage for the Committee members and the two-day format requires the Board members to stay overnight in State College. It becomes a considerable expense for the Association.

The Board approved the Executive Committee’s recommendation to increase the annual dues to \$70 (or \$75 if paid after the Convention) in view of increased costs that the Association will be facing. This is the first time the dues have been increased in 15 years. Associate members dues were increased to \$40 and Keystone Member suggested dues were increased by \$25.

The financial reports showed that income and expense are projected to be lower than budgeted for the year. The 2021 budget included a \$71,000 deficit and the projected deficit could be more than that.

It was noted that Dr. Shelby Fleischer will be retiring as the vegetable extension entomologist at Penn State at the end of the year. PVGA will need to encourage Penn State administrators to fill this position as currently it is not slated to be immediately filled. In the past the Association was successful in urging administrators to fill a vacant vegetable research position in the Plant Science Department by offering a \$25,000 contribution toward the “start-up” cost for the researcher to set up their research program. It may be necessary to do that again in this case.

Another major issue of discussion at the meeting was the upcoming retirement of Executive Director William Troxell at the end of 2023. The Succession Planning Committee is recommending that the Association look to hire his replacement in late 2022 to allow for a year of training and transition. That too will be an added expense for the Association. The Succession Committee has prepared announcements and a job description for the position and recommended that Search Committee be named to review the applications received.

While the Association is projected to end the year with a General Fund balance of about \$190,000, this year proved the value of having substantial reserves in the treasury. The Association was able to use about \$70,000 to \$80,000 of its reserves to maintain operations despite the loss of the all the Farm Show Booth income and much of the Convention income. Whether the Association will be able to have a surplus in 2022 will depend on a successful Farm Show Booth and well-attended Convention – neither of which is guaranteed.

To increase the amount of money available for research, the Board voted to again request members to consider making an extra donation for vegetable or small fruit research.

The Strategic Planning Committee asked to suspend its activities until a new Executive Director is named. The Committee led by Robert Amsterdam had led the effort to transition the Association from a 501(c)5 agricultural organization to a 501(c)3 charitable organization. This summer the Association was notified unofficially that the Internal Revenue Service would not be approving this change. Consequently, the Committee and Executive Committee decided to withdraw the application. If the Association would decide to apply again, the absence of an official denial would be helpful. The IRS recommended that the Association consider forming a separate subsidiary organization to apply for 501(c)3 status.

The Leadership and Recognition Committee announced that the nominees for the five Director positions up for election by the members will be the six incumbent Directors: Tina Forry, Barron Hetherington, Alan Kemmerer, William Reynolds, Robert Shenot and Jonathan Strite. The Committee also made recommendations for the Annual Award and Life Memberships which will be announced at the Mid-Atlantic Convention.

The Scholarship Committee announced they are considering scholarship for three applicants. In view of the increased tuition costs, the Board approved using all the interest from the Keystone Fund for scholarships beginning in 2022. Currently only \$2,000 of the approximately \$4,000 in annual interest is allocated for scholarships and the rest for research.

The Administrative Committee presented a draft budget for 2022 which included \$10,000 for “start-up” funds for the extension entomologist position. While it is hoped that membership will rebound in 2022 with the return of an in-person convention, they are exploring different ideas to help increase membership. They recommended the Association offer growers who have never been members a two-year membership for the price of one-year.

The Farm Show Food Booth Committee is preparing for the 2022 Farm Show. Veggie burgers and corndogs will be added to the menu.

The Educational Committee recommended maintaining the current educational activities along with vegetable IPM information from Penn State to the website and possibly retail price reports.

The Government Affairs Committee recommended that the Association maintain its membership in the Pennsylvania Agricultural Alliance and the United Fresh Produce Association, the latter of which will become the International Fresh Produce Association on January 1. They also recommended 17 additions to the Association’s Policy Resolutions. They are outlined in the separate article on the Annual Meeting where the resolutions will be considered by the members.

The Board adopted the following legislative priorities for 2022:

State

- Elimination of unemployment compensation fees for H-2A workers.
- Adequate agricultural research and extension funding.
- Relaxed stormwater management requirement for high tunnels.
- Reduction of stormwater fees for farmland.
- Increased broadband internet access in rural areas.
- Farmers’ Market Nutrition Program funding.
- Coordination of the state Business Depreciation Deduction Limit with the federal limit.

Federal

- Immigration and farm labor reform.
- Reform of the Municipal Separate Storm Sewer System regulations.
- Reasonable water use and produce traceability Food Safety Modernization Act rules for small growers.
- Continued Specialty Crop funding.
- Adequate agricultural research and extension funding.
- Continued nutrition program funding.
- Reasonable cost healthcare options for the self-employed and small employers.
- Inheritance tax elimination or at least maintenance of the current exemption levels.
- Maintenance of the Business Depreciation Deduction Limit at \$500,000.

NEWS



*Pennsylvania
Vegetable Growers
Association*

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commercial vegetable,
potato and berry growers.*

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PVGA Annual Meeting

The Annual Meeting of the General Membership of the Pennsylvania Vegetable Growers Association will be held on Wednesday, February 2, 2022 at 11:30 p.m. in the Crystal Room of the Hershey Lodge in Hershey, Pennsylvania, during the Mid-Atlantic Fruit and Vegetable Convention. All members are invited and encouraged to participate in the meeting.

The results of the mail balloting for the Board of Directors will be announced at the meeting. The members will also receive reports on membership, finances, and the other activities of the Association. The following additions to the Association's policy resolutions are being proposed for adoption by the members at the Annual Meeting. The underlined text is to be added to the resolutions.

Federal Policy Resolutions

The Association is on record as

1. Opposing any further regulations of fertilizer for ag use.
2. Supporting the appointment of Farm Service Agency State Committee members from nominations provided by state agricultural organizations with the terms staggered between presidential terms rather on a political patronage basis.
3. Supporting federal legislation allowing vehicles with farm plate registrations to travel throughout the 48 contiguous states with no distance limitations.
4. Supporting the exemption from regulation of privately owned bodies of water, used exclusively for farm use

State Policy Resolutions

The Association is on record as

1. Opposing the expansion of the closed dates of the Agricultural Deer Control Program (Red Tag).
2. Supporting a requirement for certified nutrient management planners to receive direct notification of changes to Nutrient Management Program regulatory standards before they legally go into effect.
3. Supporting requirements for federal agencies to coordinate with state agencies in the administration of data collection and reporting activities to ensure agricultural conservation practices are duly captured and credited in the Chesapeake Bay Model.
4. Opposing requirements for the certification of persons authorized to apply commercial manufactured fertilizers and agricultural minerals for agricultural purposes.
5. Supporting allowing parcels of less than 10 acres that are adjacent to preserved farmland be eligible for farmland preservation.
6. Supporting the reduction of the minimum subdivision size for preserved farmland to 25 acres.
7. Supporting a requirement that all expenses and legal fees incurred by an agricultural entity who brings a successful suit against a government entity for failure to comply with Right to Farm Law be reimbursed to the agricultural entity.
8. Supporting a requirement that purchasers of real estate located next to active farms and Agricultural Security Areas be notified by the seller of protections for such farms.
9. Supporting provisions that farmers be permitted to tow registration-exempt implements, trailers, and semitrailers with a personal (non-farm) truck.
10. Supporting the exemption of farmers from IFTA and UCR regulations if they travel interstate less than 5,000 miles per year from the Pennsylvania borders.
11. Supporting regulations that require PennDOT to return retention ponds built to slow water runoff along state roads to their originally engineered depths by removing sediment buildup.
12. Supporting the exemption from stormwater management fees for preserved farms and farms with implemented conservation plans.
13. Supporting requirements that solar projects be placed on marginal or non-prime farmland by providing economic and tax incentives to developers and landowners.
14. Opposing utility scale solar projects being installed on productive Class 1 and Class 2 Pennsylvania farmland.
15. Opposing state funding for solar projects producing electricity for the grid unless the panels are placed on existing structures.

The **Pennsylvania Vegetable Growers News** is the official monthly publication of the Pennsylvania Vegetable Growers Association, Inc.,
815 Middle Road, Richfield, PA 17086-9205

Phone and fax: 717-694-3596 • Email: pvga@pvga.org • Website: www.pvga.org

Our Mission:

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

Our Vision:

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

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

NEWS

State News Briefs

Governor Signs Bill Clarifying Farmers' Driver's License Exemptions

Governor Tom Wolf has signed into law Senate Bill 725, which clarifies farmers' use of Class C driver's licenses.

SB 725 clarifies the types of driver's licenses farmers can use when operating farm vehicles. It specifically clarifies Act 170, which the General Assembly unanimously passed in 2014. That legislation says that farmers do not need a commercial driver's license (CDL) to operate a farm vehicle, or combination, with a gross vehicle weight of 26,000 pounds or greater. SB 725 allows farmers with Class A, B or C licenses to operate trucks, or truck combinations, with a GVW more than 26,000 pounds.

PFB supported SB 725, which was introduced by Sen. Camera Bartolotta and unanimously passed by both the Senate and House. SB 725 goes into effect immediately.

From the Pennsylvania Agricultural Alliance Issue Update, Penna. Farm Bureau, December 2021.

Pennsylvania House Advances Two Transportation Bills

The Pennsylvania House recently passed House Bills 122 and 1307. Both bills amend Title 75 (Vehicles) of the Pennsylvania Consolidated Statutes.

HB 122 allows for "drive your tractor to school" day. The bill permits children 14 or older to drive farm equipment to school for an annual agriculture-related educational event. The equipment must be less than 11 feet in width, and the distance between the residence and school must be less than 25 miles. HB 122 passed 115-84, along a mostly party-line vote with most Republicans supporting.

HB 1307 allows multipurpose agricultural vehicles to travel up to 10 miles on the road. The existing statute only allows for MAVs to travel up to five miles. HB 1307 passed the House 120-79, mostly on a party-line vote with Republicans in support.

HB 122 and HB 1307 both head to the Senate for further consideration.

The House also considered HB 2071, unanimously recommitting the bill to the Appropriations Committee. The bill, introduced by Rep. Martin Causer, would establish a broadband authority to provide broadband internet access to unserved and underserved residents. The bill also requires the creation of a broadband plan for the state. Pennsylvania will receive a minimum of \$100 million to help provide broadband coverage across the state from the Infrastructure Investment and Jobs Act recently signed into law by President Joe Biden.

Rural broadband is a top public policy item for Pennsylvania Farm Bureau. PFB recently provided testimony in support of HB 2071, outlining straightforward goals:

Identifying a plan for deployment that prioritizes spending in areas of greatest need and provides a technology-neutral solution that results in broadband speeds that, at least, meet the current Federal Communications Commission definition of broadband

Identifying an authority best equipped to deploy grants to providers that will fill in those gaps of service

Investing substantial financial resources to the issue

The House is expected to further consider HB 2071 in December.

From the Pennsylvania Agricultural Alliance Issue Update, Penna. Farm Bureau, December 2021.

Pennsylvania Game Commission Removes High-Risk Parts Dumpsters

The PGC announced on its Facebook page this week that due to the large area now covered by Chronic Wasting Disease

(CWD) Disease Management Areas (DMA) that many of the high-risk parts disposal dumpsters have been removed.

"These were dumpsters that we provided to give hunters another option for high-risk part disposal," said Andrea Korman, Chronic Wasting Disease Biologist for the PGC. "As the DMAs have gotten bigger – and new ones added – it was simply not feasible to maintain the dumpsters at such a large scale anymore."

According to the PGC, DMAs currently cover more than 20% of Pennsylvania's land area and have expanded every year since CWD was detected in Pa. in 2012.

Korman also said that the PGC will continue to provide high-risk parts dumpsters within the Established Areas, where prevalence of CWD is the highest.

"Otherwise, hunters can dispose of high-risk parts in household trash destined for a landfill or leave them at the harvest site. They can also take their deer to a cooperating processor or taxidermist where those parts will be disposed of properly," said Korman.

The PGC will continue to provide head collection bins throughout all the DMAs where hunters can get their deer tested for free. A map of DMAs, head collection bin sites and other information can be found on the PGC website.

Within a DMA, it is unlawful to remove or export any high-risk parts of deer, use or possess cervid urine-based attractants, feed wild deer or rehabilitate wild deer. It is already illegal to feed elk in all parts of the state. Those planning to hunt or take deer within a DMA need to follow the regulations for the upcoming deer season. Deer carcasses cannot be moved outside the DMA with high-risk parts attached. High-risk parts include: the head (including brain, tonsils, eyes and any lymph nodes); spinal cord/backbone; spleen; and any parts with brain or spinal tissue present. The PGC offers free CWD testing within all DMAs. While there is no evidence of CWD being documented in humans, the Centers for Disease Control and Prevention does not recommend consuming the meat of a CWD-positive animal.

Directors Meet in State College

continued from page 3

The Board received reports from the Vegetable Promotion, Vegetable Research, Potato, Berry, Simply Sweet Onion and Penn State Liaison Committees. They also approved the following donations and sponsorships for 2022:

Farm Show Reception Sponsorship - \$500

Ag In The Classroom Program - \$500

Ag Science Education Mobile Lab - \$500

Capitol Hunger Garden (Donations budget) - \$200

Delaware Valley College A-Day Program Ad - \$125

Ag Progress Days Booth - \$550

Farm-City Day Vegetables - + \$50

Farm Show Vegetable Day Cooking Demos - \$1,650

Farm Show Public Officials Day - \$500

Keystone Cornucopia Reception - \$200

Ag Council Research Tour for Legislators - \$100

Farm Show Livestock Sale - +\$100

Farm Show Bus Transportation - +\$300

Farm Show Food Court Table Cleaning - +\$600

Farm Show Visitor's Guide Advertisement - \$875

Convention Banquet Sponsorship - \$500

Convention Ice Cream Social - \$800 to \$1,100

The Board's next meeting will be January 31, 2022, in Hershey prior to the Mid-Atlantic Convention.

NEWS

National News Briefs

NRCS Announces 2022 Funding Opportunities for Agriculture Producers

The NRCS announced funding opportunities for agricultural producers and private landowners for fiscal year 2022.

Key programs like the Environmental Quality Incentives Program (EQIP), Agricultural Management Assistance (AMA) program and Agricultural Conservation Easement Program (ACEP) are available to producers in Pennsylvania.

The EQIP is a voluntary conservation program that aims to provide financial and technical assistance to ag producers to address natural resource concerns. Through the program, the NRCS provides assistance to producers to plan and implement conservation practices. Interested applicants should visit the NRCS website for more information.

The AMA program, through the NRCS, Agricultural Marketing Service and Risk Management Agency, helps producers manage financial risk through diversification, marketing or resource conservation practices. The NRCS provides more details on its website.

The ACEP protects the agricultural viability and related conservation values of eligible land through Agricultural Land Easements and Wetland Reserve Easements. The easements protect the agricultural use and conservation values of eligible land. More details on the program and eligibility requirements are available from the NRCS.

While the NRCS accepts applications for the programs year-round, producers and landowners should apply for AMA and EQIP by Jan. 1, 2022, and ACEP by Jan. 4, 2022, to be considered for this year's funding. For more information, see <https://www.nrcs.usda.gov>

President Signs Into Law Infrastructure Plan to Spur Growth in Rural America

President Joe Biden recently signed into law the Infrastructure Investment and Jobs Act (H.R. 3684), which includes several provisions designed to boost the resiliency of farms, ranches and rural communities.

The Farm Bureau-supported bill touts \$500 billion in new spending over the next five years, including \$110 billion in U.S. roads and bridges, \$65 billion for broadband, and \$17.3 billion for ports and inland waterways. Pennsylvania, specifically, is expected to receive \$11.3 billion for federal-aid highway apportioned programs and \$1.6 billion for bridge replacement and repairs over five years. Pennsylvania will also receive a minimum allocation of \$100 million to help provide broadband coverage across the state.

"While AFBF was disappointed with the unnecessary delays in the House of Representatives, we appreciate Congress finally passing crucial bipartisan infrastructure legislation," AFBF President Zippy Duvall said in a statement. "We cannot afford to ignore the millions of miles of roadways, waterways and railways rural America relies on to keep our country fed, especially as we see widespread supply chain challenges."

"Extending broadband to rural communities is just as much a priority," Duvall continued. "A quarter of America's farm families have no high-speed internet access while working to meet the needs of a growing world. Investments in physical infrastructure like broadband will be critical to bridging the digital divide."

Sec. 23018 of the bill also includes an exemption for livestock and insect haulers from Hours of Service regulations within a 150 air-mile radius from their final destination.

The Infrastructure Investment and Jobs Act makes significant investments in western water infrastructure that is necessary to ensure future production opportunities for members being negatively impacted by prolonged drought conditions. In addition, the bill pledges funding to passenger and freight rail, public transit, airports, power and grid, and low-carbon and zero-emission school buses and ferries.

"Bipartisan efforts such as the Infrastructure Investment and Jobs Act provide commonsense solutions to our nation's infra-

structure challenges, and we look forward to seeing the bill signed into law," Duvall said.

The Senate passed the bill by a vote of 69-30 in August, and the House approved the legislation by a vote of 228-206 in November. Pennsylvania Representatives cast their votes along party lines with one exception. Republican Brian Fitzpatrick joined Pennsylvania Democrats in voting for the bill.

From the Pennsylvania Agricultural Alliance Issue Update, Pennsylvania Farm Bureau, December 2021.

Bill to Expand Rural Broadband Passes House

The Eliminating Barriers to Rural Internet Development Grant Eligibility (E-BRIDGE) Act (H.R. 3193) recently passed the House of Representatives.

The legislation, which is actively supported by Farm Bureau, removes hurdles for broadband projects under Economic Development Administration grants, including difficult last-mile efforts that often delay rural broadband deployment. It ensures local communities can partner with the private sector in carrying out broadband projects and gives communities more flexibility in complying with their funding match requirements.

The bill passed the House with strong bipartisan support by a vote of 410-16. It is unclear on whether the Senate will take up the legislation at this time.

"Broadband is critical for farmers, ranchers and rural communities," AFBF President Zippy Duvall said. "With 17% of rural Americans still without reliable broadband, the digital divide restricts access to essential education, healthcare and business resources as well as limits farmers' capacity to use the latest technology to meet sustainability goals."

Representatives Fred Keller (R-Pa.) and Guy Reschenthaler (R-Pa.) co-sponsored the E-BRIDGE Act, which was introduced by Sam Graves (R-Mo.) and Michael Guest (R-Miss.) in May of 2021.

From the Pennsylvania Agricultural Alliance Issue Update, Pennsylvania Farm Bureau, December 2021.

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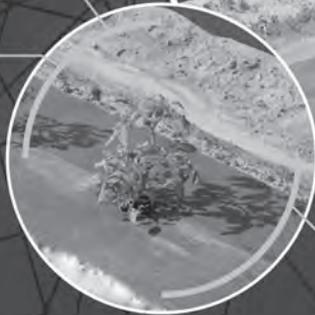
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NEWS

National News Briefs continued from page 6

Senators Introduce Legislation to Protect American Agricultural Interests

Four senators have introduced legislation that would give top U.S. agriculture and food officials permanent representation on the Committee on Foreign Investment in the United States (CFIUS). CFIUS is a panel of government officials tasked with reviewing proposed mergers and acquisitions of U.S. companies, specifically those initiated by foreign entities, to assess whether the transaction could threaten U.S. national security interests.

Senate Agriculture Chairwoman Debbie Stabenow (D-Mich.) and Sens. Chuck Grassley (R-Iowa), Joni Ernst (R-Iowa) and Jon Tester (D-Mont.) introduced the Food Security is National Security Act, which will include new agriculture and food-related criteria for CFIUS to consider when reviewing transactions that could result in control of a U.S. business by a foreign company.

The Food Security is National Security Act would grant permanent representation on CFIUS to both the Secretary of Agriculture and the Secretary of Health and Human Services (HHS), which oversees the Food and Drug Administration. Currently, CFIUS does not include permanent representation from the USDA or HHS, the two agencies with primary responsibility for safeguarding the integrity, resiliency and quality of the nation's food supply.

The legislation also adds new criteria to the CFIUS review process to ensure that proposed transactions are reviewed specifically for their potential impact on American food and agricultural systems, including availability of, access to, or safety and quality of food. Specifically including food and agriculture in the review process is an important national security safeguard and sends a strong signal to potential foreign purchasers.

The AFBF, alongside the National Farmers Union, supports the Food Security is National Security Act.

"The challenges presented by the pandemic and world supply chain issues have driven home agriculture's ties to national

security," AFBF President Zippy Duvall said in a statement. "Monitoring and evaluating mergers and acquisitions, as well as who contributes to our food production and distribution, is critical. The Secretary of Agriculture understands that, and he would bring a much-needed perspective to the Committee on Foreign Investment in the United States."

The bill can be viewed at www.grassley.senate.gov/imo/media/doc/117.sfoodsecurityisnationalsecurityact.pdf.

From the **Pennsylvania Agricultural Alliance Issue Update**, *Penna. Farm Bureau*, December 2021.

Respirator Fit Testing at Mid-Atlantic

Daniel Weber and Shane Williams

Respirator fit testing will be available for free at the Mid-Atlantic Fruit and Vegetable Convention (MAFVC) in Hershey, PA, from noon until 5:00 PM on Tuesday, February 1st, and 8:00 AM until noon on Wednesday, February 2nd, 2022. Individuals must bring their own respirator and should be clean shaven to receive a fit test. Testing takes about 15 minutes to perform and provides you with confidence that your respirator seals properly and is working as planned, keeping you safe from inhalation of hazardous chemicals.

To take advantage of this service, one must be a registered attendee of the 2022 Mid-Atlantic Fruit and Vegetable Convention. Once registered for the convention, click on the link at the MAFVC 2022 web site (<https://mafvc.org/>) or visit <https://tinyurl.com/mafvc2022-respirator-fit-test>.

Advance registration for the fit test will guarantee you a test time and will help us ensure that sufficient testing supplies are on hand to meet demand. While convention attendee walk-ins will be admitted, priority will be given to preregistered individuals and fit testing of walk-ins is not guaranteed.

The registration process is simple, with instructions provided on the sign-up page to guide you through the process if you get stuck. The only information you must provide is your name.

Although providing an email address is optional, if one is supplied when registering, a confirmation receipt will be sent recording your reservation. The receipt also includes a self-service link that allows you to change your reservation time or delete your reservation if needed. You will also receive a reminder email two days prior to your fit test.

Those not wishing to provide an email address or unable to use the internet can make a reservation, change their reservation time, or delete their reservation by contacting Shane Williams at (814) 863-9606 / stw5035@psu.edu or Daniel Weber at (717) 334-6271 / daniel.weber@psu.edu. Requests may take three business days to process.

We can manage only one person and fit test per time slot to ensure that there is sufficient time to check your equipment's integrity and confirm a proper fit. If you are an employer registering several employees, please choose a separate time slot for each individual.

When combined with proper training, personal protective equipment (PPE), and a medical test, you can apply chemicals labeled as requiring a respirator and comply with the new Worker Protection Standards. For more information about fit testing, read the "Respirator Fit Test" overview by Jim Harvey, Penn State Educational Program Specialist, at <https://extension.psu.edu/respirator-fit-test>.

The authors are with Penn State Extension.

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Convention Proceedings

If you cannot attend the Convention, you can purchase a copy of the Proceedings which contains summaries of many of the vegetable, small fruit, greenhouse and marketing presentations.

CONVENTION

2022 Mid-Atlantic Fruit and Vegetable Convention *continued from page 1***FSMA Grower Training**

\$35 includes lunch and manuals
9:00 a.m. - 5:15 p.m.

This training is for fruit and vegetable growers and others interested in learning about: produce safety, the Food Safety Modernization Act (FSMA) Produce Safety Rule, Good Agricultural Practices (GAPs), and co-management of natural resources and food safety. This PSA course is one way to satisfy the grower training requirement of the FSMA Produce Safety Rule as outlined in Section 112.22(c). Participants in the course will learn about:

- Microorganisms relevant to produce safety and where they may be found on the farm;
- How to identify microbial risks, practices that reduce risks, and how to implement produce safety practices on the farm;
- Requirements in the FSMA Produce Safety Rule and how to meet them.

After attending the entire course, participants will be eligible to receive a certificate from the Association of Food and Drug Officials (AFDO) that verifies they have completed the training course. The Pennsylvania Food Safety Resource Center is providing funds to cover AFDO certification fees and course material costs for this workshop.

PA Pesticide Applicators License Training

\$65 includes lunch and manual
9:00 am - 4:00 pm

If you intend to purchase and/or apply restricted use pesticides for the purpose of producing an agricultural commodity on land

which is owned or rented by you, then you need a Pennsylvania Department of Agriculture Pesticide License. To become a certified private applicator, testing is required. This full day session on January 31 will cover the basics and prepare you for the pesticide applicator's exam which will take place the next morning at the Hershey Lodge, February 1, from 8:30 a.m. - 11:30 a.m.

Bringing the Farm to School: A Training Program for Agricultural Producers

Free, no lunch
12:00 to 4:00 p.m.

The Maryland Department of Agriculture in partnership with the University of Maryland Extension (UME) Agriculture and Food Systems (AgFS) and the Maryland State Department of Education will conduct an USDA Farm to School Producer Training for Maryland producers interested in selling local food to Maryland's school districts and eligible providers. The intent of the workshop is to give agricultural producers training and tools to build their capacity to launch or grow efforts to market to schools, therefore increasing sales to schools for farmers while expanding farm to school activities for students in schools and communities across the nation. To register visit <https://forms.gle/kxdG-7whhusF5LdC7A>

Continued on page 9

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CONVENTION

2022 Mid-Atlantic Fruit and Vegetable Convention continued from page 9

Farm Market Tour

\$70 includes lunch

8:00 a.m. - 5:30 p.m. Bus departs from and returns to the Hershey Lodge. This year's tour will include five stops.

Butcher's Farm Market - Newport, PA
<http://www.butchersfarmmarket.com/>

Whispering Pines Fruit Farm and Country Market -
 Mt. Pleasant Mills, PA
<https://wpfruitfarm.net/>

Rusty Rail Brewing Company - Mifflinburg, PA
<https://www.rustyrailbrewing.com/>

Pik Rite, Inc. - Lewisburg, PA
<https://www.pikrite.com/>

Davy's Fresh Market - Lewisburg, PA
<https://www.davysfreshmarket.com/>

Reduced Registration for Spouses, Children or Employees

Remember the Convention offers a reduced pre-registration fee for additional persons attending from a member farm. The first person from the farm must pay the \$75 pre-registration fee but spouses, adult children, or employees are eligible for a \$60 pre-registration fee. The purpose is to make it more feasible for growers to bring additional persons from their farms to experience the educational opportunities available at the Convention. Remember, one \$70 PVGA membership qualifies all persons from the farm for the membership registration rates. And children under 16 and all students are admitted free.

Keynote Presentation



The Mid-Atlantic Fruit and Vegetable Convention is honored to have Dr. David Kohl as the keynote speaker for the 2022 Convention. Dr. Kohl is a noted agricultural economist and farm management speaker from Virginia Tech University who regularly speaks to over 20 young farmer programs annually.

Dr. Kohl's topic will be "Roller Coaster Economics and the Management Mindset." The economic environment is surrounded by uncertainty, but

also opportunities for those with a high business IQ and financial management mindset. Join Dr. Kohl as he discusses macroeconomic variables ranging from global economic trends to inflation, interest rates, supply chain disruptions, and consumer trends that will impact the financial bottom line.

Given these trends, what are time-tested business and financial practices that will place the odds of success in your favor? Practical tips, techniques, and tools will be presented that can be used in your business, family and personal life based upon his decades of engagement with agricultural businesses, research and even business ownership.

Kohl is Professor Emeritus of Agricultural Finance and Small Business Management and Entrepreneurship in the Department of Agricultural and Applied Economics at Virginia Tech, Blacksburg, Virginia. He was on special leave with the Royal Bank of Canada working on advanced initiatives for two years,

and also assisted in the launch of the successful entrepreneurship program at Cornell University. Kohl has traveled over 10 million miles throughout his professional career! He has conducted more than 7,000 seminars and webinars for agricultural groups such as bankers, Farm Credit, FSA, and regulators, as well as producer and agribusiness groups.

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CONVENTION

Annual Growers Banquet

Many of you plan to gather with friends for the evening meals at Hershey. Why not plan to join a larger group of friends and fellow growers at the Annual Fruit and Vegetable Growers Banquet on February 1. There will be door prize drawings for the ladies and brief presentations by the participating grower organizations. PVGA will present its twenty-third Annual Award at the Dinner and a Life Membership. Tickets for the banquet and reception are \$35.

Spanish Session

In an effort to provide additional education to Hispanic orchard employees, Penn State Cooperative Extension is again organizing a special session in Spanish to be held on Wednesday, February 2 at the Convention. Various relevant fruit and vegetable production topics will be presented. All are welcome, so please encourage your Hispanic friends and workers to attend the day's seminars and trade show.

Spanish session attendees must pay the regular registration fee. Employees of PVGA members are eligible for the \$60 pre-registration rate.

Ice Cream Social

After you have enjoyed dinner on your own on Wednesday, February 2, come to the Great Lobby outside the trade show hall for the twenty-second annual PVGA Ice Cream Social from 7:00 to 8:00 p.m. The social will be open to all Convention attendees, so come early to enjoy a visit with old friends and to meet new friends. We will again be designating different tables for round-table discussions on the following topics: High Tunnels, Labor, Marketing Brags & Blunders, Wildlife Controls, Farm Transition, and other topics. While you can still come just to enjoy the ice cream, we hope the designated tables will foster some valuable networking between growers. The ice cream will only be served until 8:00 p.m. but you can continue to visit for as long as you like.

The Hershey Lodge

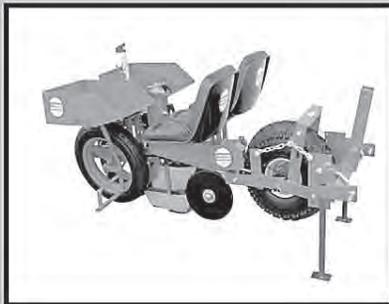
The Hershey Lodge offers an indoor pool and water park, exercise and game room, and restaurants while the Hershey area has an outlet center, Chocolate World and other attractions that will appeal to whole family. So why not plan a mid-winter vacation at the Lodge. In case of a winter storm, you can still attend all the Convention events without setting foot outside - the Convention will go on regardless of the weather. A special Convention room rate makes the Lodge more affordable. Rooms are \$162 per night for up to four persons. To make a reservation, call 1-800-HERSHEY or 717-533-3311 and tell them you are with the Mid-Atlantic Fruit and Vegetable Convention. Staying at the Hershey Lodge rather than some other motel ultimately enables us to keep the registration prices down. Plan now to spend the week in Hershey.

Pre-Register

There is no better opportunity for you to meet with vegetable, potato and small fruit experts from across the nation, dozens of vendors and fellow growers in one place. Plan now to be there! Remember that pre-registration helps us make better plans and can save you from waiting in a long registration line. You also save \$15 to \$30 by pre-registering by January 28. There is a pre-registration form in the November issue of the newsletter and on the Convention website at www.mafvc.org where you can also register online. Each member's membership renewal form, mailed by first-class mail to each member, is also a Convention registration form. You can also call PVGA at 717-694-3596 and we will be happy to mail or fax you a registration form. Walk-in registration at the Convention is also available. Checks must be used for all pre-registrations by mail. Cash, checks or credit cards are accepted at the Convention.

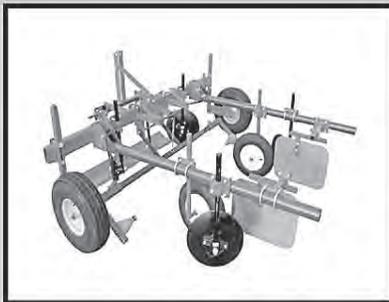
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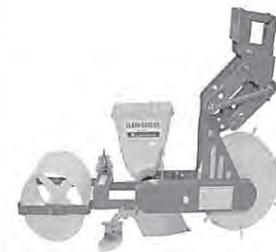
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CONVENTION

2022 Mid-Atlantic Fruit and Vegetable Convention *continued from page 11*

Convention Program

The following sessions been scheduled for the educational program at the 2022 Mid-Atlantic Fruit and Vegetable Convention.

The complete program was published in the November newsletter and is available at www.mafvc.org or by calling PVGA at 717-694-3596.

Educational Program Outline

Tuesday Morning, February 1	Tuesday Afternoon, February 1
Tree Fruit	Tree Fruit
Vine Crops	Pumpkins/Winter Squash
Peppers/Eggplant	General Vegetables I
Asparagus	Soil Health/Cover Crops
Snap Beans	General Vegetables II
Allium	Controlled Environment Ag
Food Banking	Wholesale Marketing
What is the Return on Your Marketing Dollars	Comparing POS and Reservation Systems
Keynote	

Wednesday Morning, February 2	Wednesday Afternoon, February 2
Tree Fruit	Tree Fruit
Tomatoes	Sweet Corn
General Vegetables	Stone Fruit
Greenhouse Ornamentals	Greenhouse Ornamentals
Organic Vegetable Production	Organic Vegetable Production
Marketing 101	Agritourism
Small Fruit	Small Fruit
Labor/Farm Management	Labor/Farm Management
Spanish	Spanish

Thursday Morning, February 3	Thursday Afternoon, February 3
Tree Fruit	Tree Fruit
High Tunnels	Year-Round High Tunnel Production
Winter Storage Vegetables	General Vegetable/No-Till Vegetables
Cut Flowers	Innovative Crops for Small Farms
Potatoes	Potatoes
Direct Marketing Post-Covid	Digital/Social Media
Small Fruit	Small Fruit
Stone Fruit	Labor/Farm Management

Convention Lodging: Plan to stay at the Hershey Lodge and take advantage of the special convention rate of \$162 (per room per night plus taxes). Call the Lodge at 1-855-729-3108 and tell them you are attending the Mid-Atlantic Fruit and Vegetable Convention. Or you can make reservations online at www.mafvc.org/Lodging.

FOOD SAFETY

FSMA Proposed Rule on Agricultural Water Issued

Dr. Emily Griep with the International Fresh Produce Association will be reviewing this proposed rule at the Mid-Atlantic Fruit and Vegetable Convention on Thursday, February 3 in the General Vegetable session.

The Food and Drug Administration (FDA) is proposing a revision to Subpart E of the FDA Food Safety Modernization Act (FSMA) Produce Safety Rule that would change the pre-harvest agricultural water requirements for covered produce (other than sprouts). The requirements in this proposed rule, if finalized, would replace the pre-harvest microbial quality criteria and testing requirements in the Produce Safety Rule with requirements for systems-based pre-harvest agricultural water assessments. These assessments would be used to identify conditions that are reasonably likely to introduce known or reasonably foreseeable hazards into or onto produce or food contact surfaces, and to determine whether corrective or mitigation measures are needed to minimize the risks associated with pre-harvest agricultural water.

These proposed requirements are intended to address stakeholder concerns about the complexity and practical implementation of certain pre-harvest agricultural water requirements in the Produce Safety Rule while continuing to protect public health. The requirements also are designed to be adaptable to future advancements in agricultural water quality science.

We are not proposing to change the requirements for harvest and post-harvest uses of agricultural water, or the agricultural water requirements for sprouts. Sprouts are subject to specific pre-harvest agricultural water requirements, and the compliance dates for those sprouts requirements have passed.

Agricultural Water Proposed Rule Fact Sheet

Agricultural Water Assessment

The FDA is proposing to revise certain pre-harvest agricultural water requirements for covered produce (other than sprouts)

in Subpart E of the FDA Food Safety Modernization Act (FSMA) Produce Safety Rule. This proposal, if finalized, would replace the pre-harvest microbial quality criteria and testing requirements for such produce in the Produce Safety Rule with requirements for systems-based pre-harvest agricultural water assessments that covered farms would use for hazard identification and risk management decision-making purposes. As part of the assessment, the farms would be required to evaluate the following factors to identify conditions that would be reasonably likely to introduce known or reasonably foreseeable hazards into or onto produce or food contact surfaces:

- | | |
|------------------------------|---|
| Agricultural water system(s) | <ul style="list-style-type: none"> • The location and nature of the water source (including whether it is ground water or surface water) • The type of water distribution system (such as whether it is open or closed to the environment) • The degree to which the system is protected from possible sources of contamination, including: <ul style="list-style-type: none"> • other users of the water system • animal impacts (such as from grazing animals, working animals, and animal intrusion) • adjacent and nearby land uses related to animal activity, the application of biological soil amendments of animal origin, or the presence of untreated or improperly treated human waste |
|------------------------------|---|

Continued on page 14



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FOOD SAFETY

FSMA Proposed Rule on Agricultural Water Issued *continued from page 14*

Agricultural water practices	<ul style="list-style-type: none"> • The type of application method (such as overhead sprinkler or spray, drip, furrow, flood, and seepage irrigation) • The time interval between the last direct application of agricultural water and harvest of the covered produce (other than sprouts)
Crop characteristics	<ul style="list-style-type: none"> • Susceptibility of the covered produce to surface adhesion or internalization of hazards
Environmental conditions	<ul style="list-style-type: none"> • Frequency of heavy rain or extreme weather events that may impact the agricultural water system – such as by stirring sediments that may contain human pathogens - or that may impact or damage produce. Damage can increase the susceptibility of produce to contamination. • Air temperatures • Sun (UV) exposure
Other relevant factors	<ul style="list-style-type: none"> • Including, if applicable, results of testing that could inform the assessment

Assessment Outcomes

Covered farms would use the outcomes of the pre-harvest agricultural water assessment to make written determinations about whether corrective or mitigation measures are needed to reduce the potential for contamination of produce or food contact surfaces with hazards associated with pre-harvest agricultural water. The following chart summarizes the proposed requirements for actions taken following agricultural water assessment determinations:

that your agricultural water is not safe or is not of adequate sanitary quality for intended use(s)	<ul style="list-style-type: none"> • Immediately discontinue use(s) <p><i>And</i></p> <ul style="list-style-type: none"> • Take corrective measures before resuming use of the water for pre-harvest activities
there is one or more known or reasonably foreseeable hazards related to animal activity, BSAAOs, or untreated or improperly treated human waste for which mitigation is reasonably necessary	<ul style="list-style-type: none"> • Implement mitigation measures promptly, and no later than the same growing season
there is one or more known or reasonably foreseeable hazards not related to animal activity, BSAAOs, or untreated or improperly treated human waste, for which mitigation is reasonably necessary	<ul style="list-style-type: none"> • Implement mitigation measures as soon as practicable and no later than the following year <p><i>Or</i></p> <ul style="list-style-type: none"> • Test water as part of the assessment and implement measures, as needed, based on the outcome of the assessment
that there are no known or reasonably foreseeable hazards for which mitigation is reasonably necessary	<ul style="list-style-type: none"> • Inspect and adequately maintain the water system(s) regularly, and at least once each year

Corrective measures

If a covered farm determines that its pre-harvest agricultural water is not safe or of adequate sanitary quality for its intended use(s), it would be required to immediately discontinue such use.

Corrective measures a farm could take in order to resume such use include:

- Re-inspecting the entire affected agricultural water system under the farm's control and, among other steps, making necessary changes; or
- Treating the water in accordance with the standards outlined in the Produce Safety Rule.

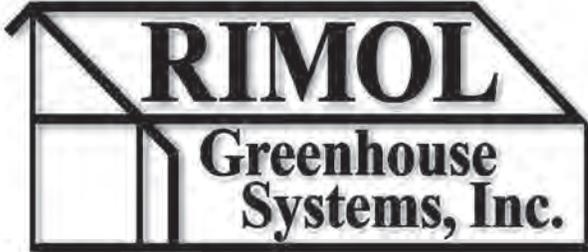
Mitigation measures

If a covered farm determines that mitigation measures are necessary to reduce the potential for contamination of produce or food contact surfaces with hazards associated with their pre-harvest agricultural water, it would have various options to choose from, including:

- Making necessary changes such as repairs;
- Increasing the time interval between the last direct application of agricultural water and harvest of the covered produce to a minimum of 4 days (except when otherwise supported by test results or other scientifically valid information) to allow for microbial die-off;
- Increasing the time interval between harvest and the end of the storage period, to allow time for microbial die-off to occur.
- Covered farms could also consider conducting other activities, such as commercial washing to reduce pathogens using appropriate microbial removal rates;
- Changing the method of water application to reduce the likelihood of produce contamination (such as changing

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from overhead spray to subsurface drip irrigation for certain crops);

- Treating the water in accordance with the standards outlined in the Produce Safety Rule; or
- Taking alternative mitigation measures supported by scientific data and information.

Reassessment

A covered farm would be required to conduct a reassessment each year in which the farm applies pre-harvest agricultural water to covered produce (other than sprouts), and anytime there is a significant change in its agricultural water systems, agricultural water practices, crop characteristics, environmental conditions, or other relevant factors that make it reasonably likely that a hazard will be introduced into or onto produce or food contact surfaces through direct application of pre-harvest agricultural water. For example, a change from an untreated ground water source to an untreated surface water source would be a significant change that would require a reassessment. The reassessment would evaluate the impacts of those changes on the factors discussed above, any new hazards identified, and the written determination of whether corrective or mitigation measures are needed to reduce the potential for contamination of produce or food contact surfaces.

Records

Covered farms would be required to maintain written records of their pre-harvest agricultural water assessments, including de-

scriptions of factors evaluated and their written determinations. Farms that test their pre-harvest agricultural water as part of their assessments would be required to maintain certain documentation related to their sampling and testing procedures. Additionally, supervisors would be required to review the written pre-harvest agricultural water assessments and the determinations made based on the outcomes of the assessments.

Exemptions

Covered farms would be exempt from conducting a pre-harvest agricultural water assessment if they can demonstrate that their pre-harvest agricultural water for covered produce (other than sprouts):

- meets certain requirements that apply for harvest and post-harvest agricultural water (such as the microbial quality criterion and testing requirements for untreated ground water);
- is received from a public water system or supply that meets requirements established in the rule (provided that the farm has public water system results or certificates of compliance demonstrating that the water meets relevant requirements); or
- is treated in accordance with the standards outlined in the Produce Safety Rule.

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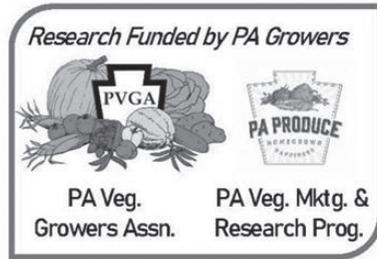
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VEGETABLE PRODUCTION

Cover Crops as a Solution to High Soluble Salt Levels in High Tunnels

Dr. Elsa Sánchez and Thomas Ford



Farmers across Pennsylvania need solutions for high soluble salts levels in their high tunnel soils. In 2017, with funding from the PVRMB, we worked with 27 farmers across Pennsylvania and found soluble salts levels averaged 1.48 mmhos/cm, which is well above levels where yields

of salt-sensitive vegetables are reduced. Salts accumulate from the use of fertilizers and organic nutrient sources. Interpretation of soluble salt levels is dependent on which testing method is used. Penn State University's Agricultural Analytical Services Laboratory uses the 1:2 (soil:water) method (Gartley, 2011). Soils with soluble salts levels of 1.48 are considered strongly saline and only salt-tolerant crops, like beets, will grow well (AASL.psu.edu). Most of the 27 farmers told us they were unsatisfied with yields, mostly of tomatoes, from their tunnels, and in some cases, tunnels were taken out of production. While some of them knew about this issue, most did not.

Cover crops with tolerance to high soluble salts levels and that have large above-ground canopies, extensive root systems, and high transpiration rates have the potential to be used to extract salts from the soil. We have suggested this general option to

farmers with high soluble salts levels but we do not know which specific cover crop types are best for drawing down salt levels.

Study objective:

We evaluated using cover crops, cut flowers, and tomato cultivars for their ability to extract soluble salts as a solution for high tunnel soils.

How the study was conducted:

The experiment was set up in a greenhouse at the Russel E. Larson Agricultural Research Center. Cover crops, cut flowers, and tomato cultivars (Table 1) seeds were planted on May 26 into 3-gallon grow bags filled with soilless potting medium. Plants were watered every Monday, Wednesday, and Friday with 250 mL of 1) normal strength Hoagland's solution (normal strength salt solution) or 2) Hoagland's solution + 150 mM NaCl (high salt solution). For the first week plants receiving the high salt solution were watered with a ¼-strength solution. Treatments were arranged in a completely randomized design with three replications. Plant height was recorded weekly for 4 weeks once seedlings had germinated. Height data were converted to percent change in growth between each salt solution treatment in each block and analyzed using the mixed procedure in SAS. Means were separated using pdiff.

Results:

Significant differences were not observed among plants receiving either salt solution treatment for the first date that height was recorded. On June 15th all plants receiving the normal strength salt solution were taller than those receiving the high salt solution. Winter rye and 'Red Russian' kale were significantly taller with high salt solution treatment than 'Oregon Spring' tomato, birdsfoot trefoil, 'New Girl' tomato, 'Wisconsin' tomato, and sugar beets (Table 1). Winter rye was significantly taller when watered with the high salt solution compared to 'Cauralina' tomato. Sorghum, 'Bolder' beet, and 'Royal' sunflower grew taller with the high salt solution compared to 'Oregon Spring' tomato and birdsfoot trefoil. All other plants were not different from each other.

By June 22 most crops did not significantly differ from each other in the percent change in height. However, birdsfoot trefoil, sorghum, buckwheat, and winter rye grew taller with the high salt solution compared to the normal strength salt solution. Winter rye grew taller than all other crops receiving the high salt solution and sorghum and buckwheat grew taller than most other crops.

On the last date height was recorded, June 29th, most crops receiving the normal strength salt solution were taller than those receiving the high salt solution. Rye remained the top performer compared to all other crops except sorghum. Sorghum outperformed most other crops.

What the results mean.

Some crops grew taller than others with the high salt nutrient solution compared to the normal strength salt solution and have the potential to be used to accumulate excess soluble salts in high tunnel soils. Winter rye and sorghum may be possible options to be used as cover crops when soluble salts levels in high tunnels are high. The key to using cover crops to remove excess soluble salts is to remove them from the high tunnel when they are terminated. Incorporating them back into the soil will add the excess salts back into the soil. Other cover crops to evaluate further include berseem clover, birdsfoot trefoil, and sugar beets. Tomatoes did not respond well to the high salt nutrient solution (Photo 1). By the second date height was recorded, plants were stunted compared to plants receiving a normal strength nutrient solution.



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At the last date of data was recorded, tomatoes receiving the high salt solution were between about 60 and 70% shorter than plants that had received normal strength nutrient solution. The difficulty in visually identifying the issue with high soluble salts levels in high tunnel soils is that the salts are uniformly found throughout tunnels. What this means is that all the plants in the tunnel will be stunted because of high soluble salts levels which masks the problem. If even one plant was not affected, it would be taller and the stunting of plants throughout the tunnel would be evident. The solution to this issue is to determine the soluble salts levels in high tunnel soil with regular testing. This study provides evidence that certain cover crops can be used to remove excess soluble salts in soils from high tunnels.



Photo 1. The tomato plant on the left received the normal strength salt solution. The one on the right received the high salt solution.

Table 1. Percent change in high between plants receiving a normal strength salt solution and plants receiving a high salt solution at three dates.

Crop	Mean change in plant height (%)		
	June 15, 2021	June 22, 2021	June 29, 2021
'Oregon Spring' tomato	0.63 a	0.62 a	0.59 a
Birdsfoot trefoil	0.60 a	-111E-18 a-b	0 ab
'New Girl' tomato	0.51 ab	0.51 a	0.32 a
'Cauralina' tomato	0.50 abc	0.53 ab	0.60 a
'Wisconsin' tomato	0.47 ab	0.50 a	0.68 a
Sugar beets	0.46 ab	<1 a-b	-222E-18 ab
Ornamental kale	0.40 a-d	0.58 a	0.55 a
'Balady 1' Berseem clover	0.26 a-d	0.36 a-c	0.08 ab
'CDC Copeland' barley	0.26 a-d	0.10 a-b	.28 a
'Boro' beet	0.25 a-d	0.38 a	.46 a
Buckwheat	0.22 a-d	-2.02 c	-
'Purple Majesty' millet	0.22 a-d	0.35 a	.22 a
WGF sorghum	0.19 b-d	-1.67 bc	-2.3 bc
'Bolder' beet	0.17 b-d	0.25 ab	.43 a
'Royal' sunflower	0.12 b-d	0.73 a	.78 a
'Red Russian' kale	0.04 cd	0.48 a	.54 a
Winter rye	0.03 d	-4.83 d	-4.7 c

How to read this table: Each value is the mean of how each crop grew with the high salt solution compared to the normal strength salt solution. Values near zero indicate that plants grown with the normal strength and high salt solution were close in height. Positive values mean that the plants grew taller with the normal strength salt solution compared to the high salt solution. Negative values mean that the plants growing with the high salt solution grew taller than those watered with the normal strength salt solution. For example, on June 15th 'Oregon Spring' tomato growing with the high salt solution was 63% shorter than plants growing with the normal strength salts solution.

Acknowledgements: The efforts of Chris Sánchez and Austin Kirt of the PSU Hort Farm Crew and Alan Bauman, an undergraduate student summer employee, helped make this project a success.

Dr. Sanchez is with the Department of Horticulture at Penn State and Mr. Ford is with Penn State Extension in Cambria County. This project was funded jointly by PVGA and the Pennsylvania Vegetable Marketing and Research Program.

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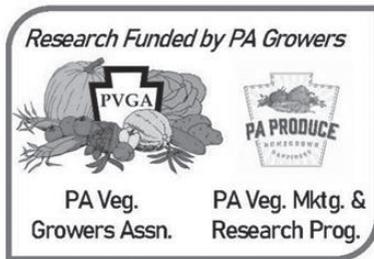
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VEGETABLE PRODUCTION

No-till vs. Plasticulture Tomatoes: Examining Yield, Earliness, and Soil Health

Elsa Sánchez, Sjoerd Duiker, and Francesco Di Gioia



We compared tomato on its own root system and grafted onto a vigorous rootstock in two no-till systems and a plasticulture system. The experiment was arranged in a split-plot design. Main plot treatments were 1) early no-till, 2) main-season no-till, and 3) plasticulture systems.

Split-plot treatments were 'Red Duce' on its own rootstock or grafted onto DRO141TX, a highly vigorous rootstock with resistance to Fusarium races 1 and 2, Fusarium crown and root rot, leaf mold, corky root rot, tomato mosaic virus, and verticillium wilt.

How the experiment was conducted

The study took place at Pennsylvania State University's Russell E. Larson Research Center in Pennsylvania Furnace. Main plots were 7 ft x 22.5 ft and subplots were 7 ft by 11.25 in size. A single row of 15 plants with 18-inch in-row spacing was planted in each subplot. Treatments were replicated four times. A rye cover crop was planted in the field in the fall of 2020.

For the plasticulture treatment, the cover crop was flail mowed when it was between 4-6 inches tall and plots were chisel plowed on April 26, 2021. On April 27 plots were disced. On April 28 plots were rototilled and beds were shaped, drip tape was installed, and black plastic was laid. For no-till treatments, the cover crop was crimped on May 7. At this time, the rye biomass was on average 31 inches tall, provided 86% cover as measured with the App 'Canepeo', and had accumulated 4193 lbs dry matter per acre. The same day landscape fabric was installed over plots and secured with landscape staples. On May 17 planting holes were burned in the landscape fabric. On May 19 the early no-till treatment plots were planted. Approximately 2 weeks later, on June 2, the main-season no-till treatment plots were planted. On June 3 (delayed 1 day because of rain), the plasticulture treatment plots were planted. A drip irrigation system was used to supplement rainfall to supply 1 to 1.5 acre-inches of water to the plants weekly. The plants received 200 lbs of nitrogen per acre throughout the growing season. Phosphorus and potassium were applied based on soil test analysis. Stakes were installed in all treatment plots with a pattern of stake-plant-plant on May 26. The Florida weave system was used to trellis plants with each string installed as needed. Pests were monitored and managed with pesticides when needed.

Harvest of red ripe fruit occurred three times per week from seven plants per subplot beginning on August 2 and continuing through September 26. Fruit were categorized as marketable and unmarketable. Marketable fruit was graded by size according to USDA criteria.

Yield data were analyzed using the mixed procedure in SAS. Means were separated using pdiff.

Soil temperature near a tomato plant was measured with an analog soil thermometer every weekday morning at about 8 am and at 4 pm at 2 inches depth, in early planted no-till plots and plasticulture plots from May 21 to June 30.

Bulk density was measured in the treatment plots of three replications using the core method (3-inch diameter and 3-inch-high metal cores). In the beginning of July, two samples per plot were taken as close to the soil surface as possible (approx. 0.5-3.5 inches depth) 30 inches from the tomato rows, which was between the plastic-covered beds in the plasticulture plots or underneath the fabric in the no-till plots. The soil was dried in a lab at 105°C until oven

dry and then weighed and expressed on a weight by volume basis.

Soil samples were collected in early July with a 0.75-inch-diameter soil probe to 6-inch depth to determine aggregate stability. Four samples were collected at similar locations as samples collected for determining bulk density. The samples were broken up, air-dried, and sieved through a 2 mm sieve. The soil was subsequently passed through a 1 mm sieve, and the material that remained on the 1 mm sieve was placed in a standard aggregate stability apparatus with 0.5 mm size sieve. The sieves were dunked into a shallow water bath for 3 minutes using the aggregate stability apparatus, and the soil that passed through the sieve was dried and weighed. After that, the soil remaining on the sieve was dispersed with a sonifier and similarly weighed after oven drying. Aggregate stability was calculated as (Dry weight of soil obtained after sonification) * 100 / (Dry weight of soil obtained after sonification + Dry weight of soil after dunking).

Field saturated hydraulic conductivity (Kfsat) was determined in the second half of July (July 19-26) with SATURO infiltrometers installed 30 inches beside the tomato rows, similar to the location where soil samples for bulk density and aggregate stability were collected. This automated method consists of installing 6-inch-diameter metal rings 2 inches into the soil and then clamping on the head after which water is ponded in the ring and the rate of infiltration is recorded automatically. The apparatus was programmed to run two cycles for a total of 75 minutes per run. Internal to the equipment, the Kfsat is calculated. One measurement was taken in each plot in the study (24 total; 4 replications).

What we observed

Grafting treatment by production system interactions were not significant for any yield variable presented.

Significant differences in marketable and unmarketable yield by weight or number were not observed between the different production systems (Table 1). Grafting resulted in higher mean marketable yields in terms of weight and number than not grafting. Grafting did not result in significant differences in mean unmarketable yields.

Unmarketable fruit were cracked, zippered, catfaced, rain checked, or were damaged by tomato hornworm or blossom end rot. The largest category of unmarketable fruit was cracked. We also did not observe significant differences in the number of fruit that were cracked by the production system or grafting treatment (Table 1).

Significant differences in fruit yield in each grading category were not observed between the production systems evaluated (Table 2). Grafting resulted in a higher yield of extra-large fruit by weight but not by number compared to not grafting. Grafting also resulted in a higher yield of small fruit by weight and number compared to not grafting. Grafting treatment did not result in significant differences in fruit in the large or medium size categories.

Harvest started about a week earlier in the early no-till plots regardless of grafting treatment compared to all other treatments. Although, the amount of fruit harvested was small.

The soil temperature at a 2-inch depth was significantly higher in plasticulture treatment plots in the morning as well as in the afternoon. The mean soil temperature in the plasticulture plots was 68°F, while in the no-till plots it was 65°F. The mean soil temperature in the afternoon was 83°F and 76°F, respectively, in plasticulture and no-till plots. The soil in the plasticulture plots was 3°F warmer than in the no-till plots in the morning and that difference was 7°F in the afternoon.

There were no significant differences in bulk density due to production system or grafting treatment. The average bulk density

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was 1.55 g/cm³. According to the Soil Quality Physical Indicator Information Sheet from USDA-NRCS, the ideal bulk density for plant growth in a silty soil is less than 1.40 g/cm³, while root restricting bulk density is greater than 1.65 g/cm³. For clay soils these values are lower (1.10 and 1.47 g/cm³, respectively). The soil therefore had suboptimal bulk density suggesting it was highly degraded due to past management.

Similar to bulk density, there were no significant tillage or grafting effects on aggregate stability. The average aggregate stability was 37%, which is low, also showing the highly degraded nature of the soil we used for this trial.

Grafting treatment by production system interactions were significant for the Kfsat (Table 3). The mean Kfsat in the early no-till + grafted plots was higher than in early no-till + not grafted, plasticulture + grafted, and plasticulture + not grafted plots. Additionally, the mean Kfsat in the early no-till + grafted treatment was not different than the main-season no-till + grafted and main-season no-till + not grafted treatments.

What this means

A limiting factor to the adoption of no-till systems is lower yields compared to plasticulture systems. In this study, we observed that yields were not different when using no-till or plasticulture treatments. This study should be conducted again to verify results are repeatable and economic analysis should accompany results; however, this result provides preliminary evidence that a no-till system using landscape fabric can provide comparable yields to plasticulture systems. Other benefits should be factored into using landscape fabric including weed suppression and the ability to work in plantings (for stringing, scouting, and more) when the soil is wet.

Grafting also appears to be a promising technology to increase tomato yields regardless of the production system used. In this study, the increased yield because of grafting came from an increase in the weight of extra-large fruit and the weight and number of small fruit. The rootstock we used was highly vigorous and had resistance to several diseases. We also evaluated grafting in the muskmelon cultivar evaluation we conducted with PVMRP funding. In that study, grafting did not result in higher

yields compared to not grafting. Grafting is commonly thought to provide a benefit to plants under stressful conditions. In the muskmelon study, the rootstocks used had resistance to diseases, however, disease pressure was low during the experiment. In this tomato study, aphids and Septoria leaf blight were problems and were treated with pesticides. This insect pest and disease were not listed as part of the DRO141TX rootstock resistance package. Plants were also under the stress of excess moisture from several extreme rainfall events that occurred during the 2021 growing season. This resulted in a lot of unmarketable fruit due to concentric and radial cracking. In fact, most unmarketable fruit were cracked. However, grafting plants did not result in a lower number of cracked fruit or reduce the overall amount of unmarketable fruit compared to not grafting plants. This suggests that the increased yields observed using the DRO141TX rootstock were the result of increased plant vigor.

Soil quality as measured by bulk density and aggregate stability was not different among any of the production systems and/or by the grafting treatments. Grafting increased water infiltration in both no-till systems compared to the plasticulture system. This is probably because in the plasticulture system few roots of grafted or not-grafted plants influenced the soil 30 inches from the row. Testing showed that the field soil was highly degraded. A single growing season using a no-till production system did not improve soil quality compared to using a plasticulture system as measured by bulk density or aggregate stability. Developing no-till production systems for other crops used in rotation with no-till tomato is likely needed to improve soil quality over the long term.

Table 1. Mean marketable and unmarketable yield observed in a study evaluating grafted and not grafted tomatoes grown in two no-till and one plasticulture production system.

Treatment	Marketable yield*			Unmarketable yield	
	lb	No.	lb	No.	Cracked (no.)
Grafting					
Grafted plants	47.0 a	74.5 a	26.1 a	43.1 a	31.2 a
Not grafted plants	34.7 b	57.8 b	29.3 a	47.6 a	36.6 a
Production System					
Main-season no-till	42.6 a	69.8 a	28.9 a	48.0 a	35.3 a
Early no-till	46.2 a	75.1 a	30.5 a	50.0 a	38.3 a
Plasticulture	33.8 a	53.6 a	23.7 a	38.0 a	28.1 a

*Yield per 7 plants; Values within a column and treatment group followed by the same letter are not statistically significantly different.

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No-till vs. Plasticulture Tomatoes *continued from page 19***Table 2.** Mean marketable yield by grade observed in a study evaluating grafted and not grafted tomatoes grown in two no-till and one plasticulture production system.

Treatment	Grading Category							
	Extra large*	Extra large	large	large	medium	medium	small	small
	lb	No.	lb	No.	lb	No.	lb	No.
Grafting								
Grafted plants	26.7 a	32.5 a	15.8 a	29.5 a	3.9 a	11.2 a	1.1 a	3.8 a
Not grafted plants	19.7 b	24.3 a	13.1 a	25.6 a	3.1 a	8.1 a	0.3 b	1.3 b
Production System								
Main-season no-till	22.4 a	26.1 a	16.6 a	31.2 a	3.9 a	10.1 a	0.4 a	1.6 a
Early no-till	26.4 a	34.4 a	16.6 a	32.4 a	4.2 a	12.0 a	1.0 a	3.5 a
Plasticulture	20.7 a	24.8 a	10.1 b	19.1 b	2.4 a	6.9 a	0.7 a	2.5 a

*Yield per 7 plants; Values within column and treatment group followed by the same letter are not statistically significantly different.

Table 3. Field saturated hydraulic conductivity as affected by tillage and tomato grafting

*Values followed by different letters are significantly different (Fisher's Protected LSD, $p < 0.05$). Statistical analysis was done on $\log(1+x)$ transformed data to obtain normally distributed data set for analysis. Means presented are non-transformed.

Treatment		Mean Kfsat	
		in/hr	
Early no-till	Grafted	4.062	A*
Main-season no-till	Grafted	2.298	AB
Main-season no-till	Not Grafted	1.651	ABC
Early no-till	Not Grafted	1.532	BC
Plasticulture	Not Grafted	0.874	BC
Plasticulture	Grafted	0.533	C

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Dr. Sánchez, Dr. Duiker, and Dr. Di Gioia are with the Department of Plant Science at Penn State. This project was funded jointly by PVGA and the Pennsylvania Vegetable Marketing and Research Program.

Warm Rooms for Storage Crops & Freeze Protection for Coolers

Chris Callahan

Some crops like winter squash and sweet potatoes are ideally kept in "warm" rooms for long-term storage. It is also helpful to have some freeze protection even in cold storage rooms during the winter months when outside temperatures drop below the storage temperature. The information below should help accomplish both of these needs simply and inexpensively.

Knowing Your Heat Load

The first step in figuring out how to keep a space warm or prevent freezing is knowing how much heat will be needed. This depends on the size of the space, the insulation, air infiltration and the inside and outside temperatures. Our online calculator will help you determine how much heating you need to keep a specific space at the right temperature. A heat load is typically given in units of BTU/hr (British thermal units per hour) or Watts. Sometimes heater specifications simply state "BTUs" which can be read as BTU/hr. Electric heaters are typically rated in Watts and combustion appliances such as wood, propane, or fuel oil heaters or stoves are rated in BTU/hr. The calculator provides the heat load in both units and you can always convert between units knowing that there are 0.239 Watts per BTU/hr (or 3.41 BTU/hr per Watt).

It may be helpful to remember that storage crops are living organisms and they respire. Respiration gives off heat and moisture. Some growers are able to store warm storage crops without

any additional heating when using a well-insulated and well-sealed room due to the heat given off from the crops. Winter squash, for example, has a high rate of respiration and can "self-heat." For an estimate of respiration heat, you can use our crop storage planner.

Choosing a Heater

Select an appliance that is actually designed for heating. It may be tempting to use a lightbulb or heat lamp, but these can present other problems such as sprouting (due to light) or fire hazards (due to exposed hot surfaces). Some pointers:

- Choose a heater with a UL listing.
- Make sure there are fire protections included in the heater such as grates, stand-offs, tip sensors, and overheat switches.
- Heaters with lower maximum surface temperatures are generally going to be more safe.
- Choose a heater that will turn on when power is applied or one that has an integrated thermostat (see next section). Some heaters have a second step required after power is applied to activate it. These won't work well with an external thermostat used for freeze protection.

Below are some heaters that should work well in this application.

Panel heaters with on/off control that would work with an external thermostat for freeze protection.

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- Cozy Chicken Coop Flat Panel Heater – \$40, 200 Watts. Available at Tractor Supply and Home Depot.
- Cozy Legs Flat Panel Heater – \$45, 150 Watts. Available at Bed, Bath & Beyond.
- AirChoice Electric Heater – \$150, 400 Watts. Available on Amazon.

Oil filled heater with integrated thermostat best suited for warm room applications (won't work well with an external thermostat).

- NewAir Electric Oil Filled Radiator Heater – \$150, 1000 Watts. Available at Tractor Supply.

Controlling the Heat

Heaters are typically controlled by thermostats or timers. Timers simply turn the heater on for a period of time and don't offer precise control of temperature. Thermostats measure temperature and turn a heater on or off based on that measurement. Read more at our post about thermostats.

Some heaters come with a thermostat integrated into the heater. This may be the easiest option for heating a warm room. Unfortunately, these integrated thermostats are most often designed for human comfort (>50 °F) and don't go low enough to offer freeze protection for cold rooms.

An external thermostat with a wider range can be used to turn heaters on and off at lower setpoints such as 32 °F. These can be purchased with plugs attached to make installation easier. Check the amperage rating of the thermostat compared to the heater(s) you plan to control. Some examples are provided in this post at <https://blog.uvm.edu/cwcallah/2016/05/03/thermostats-for-agriculture/>.

Distributing the Heat

It may be helpful to add a small circulation fan in the room to distribute the heat throughout the space. Aim for 2-4 cubic feet

per minute of air flow per square foot (CFM/ft2) of storage space. For example, a 10 foot x 10 foot warm room should have 200-400 CFM of circulation air flow which is generally one or two small fans. Consider a wall or ceiling mount fan to keep it out of the way and to prevent it being knocked over or falling over.



This Honeywell TurboForce HT-900 is an inexpensive option for air circulation. It provides up to 185 CFM with 3 selectable speeds and has slots on the base for wall or ceiling mounting. \$20.

Air circulation is important even if trying to make the most of respiration heat from the crops. It is also helpful to leave some space between storage bins and also between bins and the wall. This allows air to pass more freely so that all storage crops see the same conditions. Remember that stored produce is alive and respiring, so air circulation can help prevent hot spots and areas of high humidity and condensation.

Mr. Callahan is with the Department of Agricultural Engineering at the Univ. of Vermont. From Univ. of Vermont Extension, <https://blog.uvm.edu/cwcallah/2021/11/29/warm-rooms-for-storage-crops-freeze-protection-for-coolers/>.

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Lettuce Downy Mildew

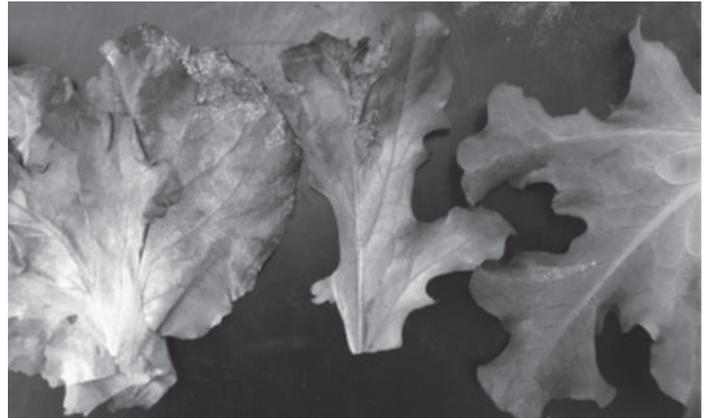
Susan B. Scheufele



Crusty, white sporulation forms under humid conditions. Photo: S. Scheufele.

Downy mildew (*Bremia lactucae*) is a common disease of lettuce in cooler growing environments, where temperatures are low and there are long periods of leaf wetness caused by overnight dew. These conditions are common in late-fall and in cool-season greenhouses. Symptoms include white sporulation on leaf surfaces, which growers may assume to be powdery mildew. Downy mildew sporulation is raised and appears slightly granular, whereas powdery mildew is flatter and appears flush with the leaf. Importantly, downy mildew requires cool weather and leaf wetness while powdery mildew occurs during warm weather and under dry conditions. Downy mildew is caused by an oomycete (like late

blight) and powdery mildew is caused by a fungus, so fungicides used to control one may not control the other. If you plan to control lettuce powdery or downy mildew with fungicides, be sure to properly identify the pathogen or submit a sample to the diagnostic lab before making an application.



Grayish, water-soaked lesions on red lettuce. Photo: S. Scheufele

Symptoms:

Lettuce downy mildew causes leaf yellowing in angular patches, as the spots are vein-limited. On red leaf varieties the initial spots may appear more grayish and water-soaked. Under humid conditions, sporangiophores emerge from stomata and produce sporangia (infective spores). This crusty white sporulation looks similar to brassica downy mildew. Sporulation usually forms on the underside of the leaf but may also be seen on the upper leaf surface. Later, lesions turn tan or brown and papery as the tissue is killed. Older leaves close to the ground usually are the first to show symptoms.



Lettuce powdery mildew. Photo: M.T. McGrath

Crop Injury:

Downy mildew can reduce yields and quality of the crop. Infected wrapper leaves must be removed at harvest. Mild infections may go unnoticed, if sporulation only occurs on lower leaves, but infections on the cap leaves or of leaf lettuce may require abandoning heads or whole plantings in the field. Sporulation can develop after harvest, resulting in symptomatic lettuce on market shelves. Downy mildew-damaged leaf tissue can be an entry site for secondary rot producing organisms. These rot organisms may compound crop losses in the field, and can also cause losses later when the lettuce is in transit.

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Life Cycle:

Damp, cool conditions and moisture on leaves are required for the pathogen to infect lettuce and cause symptoms to develop. The short-lived sporangia are dispersed by wind. Cultivated lettuce is the main host but it has also been reported on other plants in the Asteraceae family such as artichoke, cornflower (*Centaurea cyanus*), and strawflower (*Helichrysum bracteatum*). *Bremia lactucae* is a complex organism, consisting of Crusty, white sporulation forms under humid conditions. Photo: S. Scheufele. Grayish, water-soaked lesions on red lettuce. Photo: S. Scheufele. Lettuce powdery mildew. Photo: M.T. McGrath 4 multiple races or pathotypes, which affect different lettuce cultivars. Major pathotypes are numbered in both Europe and the U.S., and the numbering is separate between the two continents. Currently, 9 races have been identified in the U.S. and 37 have been identified in Europe, however US races 1-4 and EU races 1-15 are no longer active or important in the field, so economically important pathotypes are limited to US 5-9 and EU 16-37. However, the pathogen is highly complex and new races continue to occur as the pathogen changes. Within each pathotype, some isolates have developed a lack of sensitivity to some fungicides. It is not entirely clear whether or not *B. lactucae* produces more persistent overwintering spores (oospores) in our area, if it is blown in from other growing regions, or is associated with seed.

Cultural

Control: Planting resistant varieties is the most effective strategy for preventing lettuce downy mildew. However, choosing the right resistant variety necessitates that one knows which strain(s) of the pathogen is present. Resistance is reported for EU and US strains separately; for example, the head lettuce variety 'Muir' is reported as having resistance to EU 16-26, 28, 32 and US 5-9. Because the pathogen is constantly changing and because there are so many more identified EU pathotypes than US pathotypes, the strongest resistance can be achieved by growing lettuce varieties with resistance to as many EU pathotypes as possible (despite not all of the EU pathotypes being present in the US). Resistance to newer pathotypes (e.g. higher numbers) may also provide better, broader protection against the newest, unnumbered pathotypes.

We are interested in hearing from anyone who sees lettuce downy mildew on their farm this winter so that we can track which pathotypes are showing up in the Northeast—contact us at umasveg@umass.edu if you suspect the disease in your lettuce!

Other cultural controls may include:

- Destroying crop residues promptly after harvest
- Crop rotation into unaffected fields
- Buying quality seed
- Reducing leaf wetness by using drip irrigation, increasing spacing, orienting rows parallel with wind, controlling weeds, and so on
- Heat and vent greenhouses to remove moist air

Chemical Control:

Many fungicides are labeled to control downy mildew and can be effective if a spray program is started early, before disease occurs when conditions are favorable. Oomycete-specific materials (e.g. Tanos, Ranman, Curzate) should be mixed with a broad spectrum fungicide (e.g. mancozeb or copper). For organic growers, contact fungicides (e.g. Oxidate or Milstop) have been found by growers to be most effective. Organic contact fungicides need to be applied on a tight spray schedule, as they do not have residual activity. See the [Mid-Atlantic Commercial Vegetable Recommendations] for a complete list of registered fungicides. Greenhouse or high tunnel growers: Make sure that any fungicide you plan to apply is not prohibited from use indoors. Unless the label specifically prohibits indoor/greenhouse/high tunnel use, it is allowed. A Michigan State University article at https://www.cnr.msu.edu/news/vegetable_pesticide_series_can_i_use_it_in_the_greenhouse includes a spreadsheet with information about whether or not pesticides can be used in greenhouses or high tunnels. Be sure to check the label yourself as well (we find the easiest way is to find the product label at <http://www.cdms.net/Label-Database>, then search the pdf for the words "indoor" and "greenhouse", as well as carefully reading the applicable crop section on the label). Check labels for pre-harvest intervals.

Ms. Scheufele, is with the Univ. of Massachusetts Vegetable Program. From Vegetable Notes for Vegetable Farmers in Massachusetts, Univ. of Mass. Extension, Vol. 33, No. 26, December 2, 2021.

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