



Growers Vote to Continue Vegetable Marketing and Research Program

Nearly 80% of the vegetable growers voting in the review referendum on the Pennsylvania Vegetable Marketing and Research Program voted “Yes” to continue the Program for another five-year period. A total of 395 eligible ballots were received with 315 voting “Yes” to continue the Program and 80 voting “No”. Fourteen ballots were ruled to be ineligible or spoiled. Over 2,000 ballots were mailed to growers. The official results will be announced in a letter to growers from Secretary of Agriculture Russell Redding. The Vegetable Marketing and Research Program Board greatly appreciates this vote of confidence in the work of the Program.

The Vegetable Marketing and Research Program has been consistently supported by growers in previous review referendums. In 2013, 85% of the growers voted in favor of continuing the Program compared to 84% in 2008, 78% in 2003, 66% in 1998 and 60% in 1993.

Growers are required to pay an annual assessment to the Program of \$25 for the first five units of production plus \$1.50 for each additional unit of production. Units of production are acres for field production and 1,000 sq. ft of greenhouse or high tunnel production area. Growers can elect to pay an assessment of 1.25% of their gross sales, but in most all cases the production area method will result in a lower assessment payment.

The Program was originally established by a grower vote in 1988. Since its establishment, the Program has funded over \$620,000 worth of practical vegetable research by Penn State and other universities and research entities. The Program helped established systems to monitor tomato diseases and

sweet corn insect pests so growers can time their fungicide and insecticide applications to be more effective. Various weed and root rot control methods for snap beans and other crops have been evaluated by the Program’s research efforts. A long-term tomato breeding project plus variety trials for several different crops have been supported as well as herbicide, plasticulture and high tunnel studies.

In addition, over \$550,000 grower assessment dollars have been supplemented by \$400,000 in state and federal grants to promote Pennsylvania-grown vegetables. The Program has distributed thousands and thousands of price cards, price paddles, stickers, recipe cards, brochures, banners, posters, and signs to growers and markets across the state, enabling them to promote Pennsylvania vegetables with professional looking point-of-purchase materials. In addition, the Program has touted Pennsylvania vegetables to millions of consumers on the radio airwaves, on billboards and in newspapers across the state. The annual “August is Pennsylvania Produce Month” promotion supported by the Program’s consumer website at www.paveggies.org and a robust social media campaign are the focus of the Program’s promotion efforts in recent years.

The Program is controlled by a Board consisting of the Secretary of Agriculture (or his designee), 12 growers appointed by the Secretary with four growers being appointed from each of the western, central and eastern regions of the Commonwealth, and a representative sales agents. Board members serve without compensation other than travel expenses to attend meetings.

Peter Salerno III Receives Second PVGA Young Grower Award



The winner of the second PVGA Young Grower Award is Peter Salerno III in Lehighton, Carbon County. This award is designed to recognize outstanding young growers in the vegetable, potato or berry industries.

Peter, or PJ as his family calls him, attended Kutztown University where he majored in Criminal

Justice. In January of 2015, PJ made the decision to leave Kutztown and follow his passion and become a farmer. He enrolled in an apprentice program at the Seed Farm in Emmaus and in October, our family purchased a 76 acre Christmas tree farm in Lehighton. In December of 2016, PJ, with the assistance of the USDA, purchased an additional 32 acre parcel nearby. In total, he now operates a 108 acre farm known as Foothill Farm.

Christmas trees are still a big part of Foothill Farm and 2017 was PJ’s third Christmas season. The farm dedicates approximately 55 acres to growing 6 varieties of trees. As of today, there are approximately 24,000 trees planted on the farm. PJ plants approximately 6,000 trees each year and plans to be at full capacity (60,000 trees) in 7 years.

The spring of 2016 was PJ’s first vegetable season. Following organic principles, he grew a variety of vegetables

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Pennsylvania Vegetable Growers Association

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

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Scholarship Application Deadline Extended

Carville Mace Awarded 2017 Rudolph Grob Memorial Scholarship

Carville Mace Jr. of Littlestown was awarded a Rudolph Grob Memorial Scholarship from PVGA in 2017. These scholarships are awarded each year to a child or grandchild of a PVGA member who is pursuing higher education with the goal of working in production agriculture.

Carville is pursuing a degree in Business Management at Penn State University Harrisburg. He works with his father in managing their farm, Foxleigh Farm, in Littlestown. They recently expanded their production with the intention of selling more crops through the Cumberland Valley Produce Auction. Carville is also farming 40 acres of rented ground on his own – growing soybeans and grain and acquiring equipment. He is working towards developing his own vegetable operation when he finishes school. Meanwhile, he is also has a contract to plow snow during the winter.

For 2018, three scholarships will be available since only one scholarship was awarded in 2017. The Association gives the annual scholarships in the amount of \$1,000 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 scholarships is to assist children and grandchildren of Association members in obtaining a degree that will enable them to pursue a career in the vegetable, potato or berry production industries. Applicants must meet the following criteria:

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

The deadline for the three scholarships available for 2018 has been extended to May 31, 2018. Applications are reviewed by the Association's Scholarship Committee which determines who receives the scholarships. The current committee members are: Carolyn Beinlich, Keith Eckel, Curtis Kaelin, Michael Orzolek and Hilary Schramm, Jr.

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

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.

Applications must be received or postmarked by May 31, 2018, 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 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.

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 Secretary, at the above addresses.



Bill to Ease Regulations on High Tunnels Passes the Senate

On Monday, March 26, the state Senate passed HB 1486, Rep. Zimmerman's bill that will exempt high tunnels from the requirement for stormwater management plans. It is somewhat uncertain whether the Governor will sign the bill since the Administration had concerns about the bill's language in that it included fabric covered farm structures with floating concrete floors as well as traditional high tunnels used for vegetable and small fruit crop production. PVGA also has concerns about provisions in the bill that may only exempt smaller high tunnels. We have heard differing interpretations of what the bill will allow.

The bill would prevent municipalities from requiring that farmers submit stormwater management plans on high tunnel structures that meet common sense guidelines clearly identified in the legislation.

New Statewide Organization for Farmers Markets and On-Farm Markets

If you manage a farmers market or retail farm market, where do you go for information? What, if any, regulations do you need to follow? How can you connect with other managers? What resources are available?

With help from PA Preferred and the former Retail Farm Market Association, PA Farm Markets is ready to launch! PA Farm Markets, LLC is a membership organization made up of Market managers, owners, and vendors and provides services for the benefit of its members.

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

Benefits of membership include:

- access to educational materials and programs such webinars and online programs
- monthly newsletter
- monthly video podcast "The Market Minute"
- membership sign for your market
- access to the discussion groups to connect with other managers

New members have a choice of receiving either a FREE hat or a t-shirt and a member sign for your market when they join. For further information, visit www.pafarm.com or call 610-391-9840.



State News Briefs

Governor Outlines State Budget Proposal

Gov. Tom Wolf's proposed 2018-2019 state budget would ramp up funding for the Pennsylvania Department of Agriculture's operations and maintain funding for several programs critical to farmers, including for Penn State Cooperative Extension and the University of Pennsylvania School of Veterinary Medicine. But the plan would also eliminate funding from several other important agriculture programs.

The governor's plan calls for an 8.5 percent increase in the Department of Agriculture's general operations, which provides funding for jobs and services that support agriculture, and the continuation of current funding for the Animal Health Commission, transfers to the Nutrient Management Fund and Conservation District Fund, Pennsylvania Fairs and the Pennsylvania Farm Show. Funding for Extension and Penn Vet would remain at current levels.

"We are pleased that the governor's proposal recognizes the important role programs overseen by Penn State and Penn Vet play in helping farmers learn about and implement positive changes on their farms based on breakthroughs in research and technology, while also benefitting from research and practical solutions that improve animal health and the food supply," said Pennsylvania Farm Bureau President Rick Ebert.

The organization has concerns about other parts of the plan that would eliminate funding for the Agricultural Excellence Programs, Agricultural Research and several other promotional programs administered by the state Department of Agriculture. PFB plans to work with lawmakers and the Wolf administration to restore funding for those programs in the final budget.

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

ACRE Law an Important Tool for Farmers

The ACRE (Agriculture, Communities and Rural Environment) Law, ensures that local ordinances that attempt to regulate agricultural activities do not violate state law. The law states that if a municipality has an agriculture-related ordinance that conflicts with, exceeds or duplicates already-existing state agricultural standards, then that local ordinance cannot stand.

Pennsylvania Farm Bureau members who gathered for Farm Bureau Days events in several regions last month, had the opportunity to hear Deputy Attorney General Rob Willig speak about the ACRE Law. Willig is the point of contact in the Pennsylvania Attorney General's office that deals with ACRE complaints.

Willig, speaking at an event in Montgomery County, acknowledged that farming was a top priority of Pennsylvania.

"Agriculture is vitally important to the health of the Commonwealth," he said, adding that agriculture has a \$75 billion economic impact in the state. "If that \$75 billion is cut by a fraction," he said, "it can have catastrophic effects."

When it comes to dealing with townships and municipalities passing ordinances that could be potentially disruptive to farming, ACRE has been a good tool to aid farmers. "ACRE is just one more arrow in our quiver to help farmers and sustain agriculture," Willig said.

He added that filing an ACRE complaint is easy. "You can start the ACRE process right there on the website, send me an email, or call the number," he said. There is no official form to start a complaint, and it doesn't have to be in any specific for-

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mat. Willig said he's even had complaints come in on handwritten sheets of paper.

For every complaint he receives, Willig sends a letter to the township that he has received an ACRE complaint that is under review. He also sends a letter to the farmer acknowledging that the complaint was received.

Willig said he tries to resolve complaints first by working as a mediator between the farmer and the township. If that doesn't work, he goes through a more-lengthy process of researching the ordinance and the law and, if there are discrepancies, notifying the township.

Most of the time, Willig said, they don't have to go to court over a problematic ordinance. When Willig decides to accept a case, he writes up a letter brief to send to the township. Usually, the township accepts the research and changes the ordinance, and the case is closed. If the township disagrees or won't change the ordinance, the attorney general's office has the right to sue in Commonwealth Court if the township doesn't want to change the ordinance. Willig said that's the last resort he will turn to.

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

Game Commission Establishes New Disease Management Area

The Pennsylvania Game Commission has established a new Disease Management Area (DMA) in an effort to slow the spread of chronic wasting disease in the state.

The move came in response to the detection of a CWD-positive deer on a deer farm in Lancaster County, the only known case of CWD so far in that area.

The new Disease Management Area 4 will include 346 square miles in northeastern Lancaster County, southeastern Lebanon County and western Berks County. That includes the Adamstown, Denver, Ephrata, Mohnton, Richland, Womelsdorf and Wyomissing areas as well as state Game Lands 46, 220, 225, 274 and 425.

The Game Commission will increase sampling for CWD within the new area. The commission will test all road-killed deer in the area and take steps to encourage hunters to submit samples for testing.

Hunters and residents with DMAs face certain restrictions intended to stop the spread of the disease.

The intentional feeding of deer is prohibited within DMAs and hunters may not use or possess urine-based attractants. Hunters who harvest deer within a DMA may not transport the carcass outside the DMA without first removing and properly disposing of all high-risk deer parts, including the head and backbone.

CWD is an always-fatal illness that affects deer, elk and other cervids. It has not been proven to affect humans; however, experts recommend using caution when handling deer carcasses and not eating the meat of CWD-positive deer. The number of CWD cases has risen sharply in Pennsylvania and the disease has been detected in both free-ranging and captive deer.

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

Learn Basics of Local Government Involvement with New Online Course

Thinking about joining a local board, running for elected office or even advocating for issues in your community? A new online course offered by Penn State Extension aims to give students the information they need to get more involved with local government.

The self-paced course is available from the comfort of your home and includes a series of videos and readings. It takes only about six hours to complete and covers topics such as the structure and function of local government, tips for getting involved and the basics of running for elected office.

"There are so many local government organizations within Pennsylvania, from school boards to townships and more," said Judy Chambers, course instructor and economic and community development educator for Penn State Extension. "There's a constant need for people to get involved, either as volunteers or elected officials, and a real opportunity to make a significant difference within your own community."

The cost to register for the course is \$69. To learn more or register, visit <https://extension.psu.edu/getting-involved-in-your-pennsylvania-local-government>.

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

Looking for Farm Labor?

In our membership and other grower surveys, farm labor is listed as a major concern facing growers. Besides the various rules and regulations regarding labor, simply finding enough good, reliable, skilled and legal farm workers is challenging for many growers. PVGA is exploring how we as an Association can help growers find that labor source. Currently the federal H-2A program is one way that some growers have successfully used to find workers. However, it does require considerable paperwork and expense. We are in contact with the Pennsylvania Department of Agriculture and other groups trying to develop a cooperative approach to working with the H-2A program that will make it less daunting and more cost-effective for smaller growers who may only be looking to hire a few H-2A workers. If you would be potentially interested in working with this cooperative effort, please contact PVGA at 717-694-3596 or pvga@pvga.org so we know of your interest and can keep you informed about the effort. We anticipate organizing an all-day session in early November to assist growers in filling out the H-2A application. It would be followed up by a subsequent session, perhaps at the 2019 Mid-Atlantic Convention, with further information. Again, please let us know if you would be interested in at least exploring this possibility.



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NEWS

National News Briefs

Congress Passes \$1.3 Trillion Spending Package

Early Friday, March 23, the Senate passed a \$1.3 trillion omnibus spending package to fund the federal government until September 30, 2018. The House previously passed the spending package on Thursday, and the President signed the omnibus legislation Friday afternoon. Notable for agriculture, the legislation includes: a permanent reporting exemption for air emissions from farm animal waste, an extension waiver from the electronic logging device mandate for livestock and insect haulers until September 30, the creation of a \$625 million pilot program for rural broadband, a prohibition against closing county FSA offices, and funding increases for agricultural research, conservation programs, and FSA programs and loan officers. Specific to air emissions, the omnibus legislation exempts farm animal waste air emissions from reporting requirements under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and negates the impending May 1 CERCLA reporting deadline. It also fixes the Section 199A "grain glitch" tax deduction which provided preferential tax treatment to certain producers who sold agricultural commodities to cooperatives, rather than to private companies. The new Section 199A provision restores balance to commodity markets and reestablishes fairness between cooperative and non-cooperative agriculture producers.

From Farm Bureau Express, Penna. Farm Bureau, March 23, 2018.

Farm Bureau Calls for Clarity on Electronic Logging, Hours of Service Rules

Farm Bureau is urging the federal government to give agricultural haulers a limited exemption from a mandate that commercial haulers use electronic logging devices to comply with hours of service regulations. When the electronic logging mandate went into effect in December, agricultural haulers were initially granted a temporary, 90-day waiver from the new requirements. But that waiver is due to expire March 18. Farm Bureau has argued the hours of service requirements-which the electronic logs are intended to enforce-are problematic for transporting live animals due to the requirement that drivers stop and take a minimum 10-hour break after reaching their service hour limit. At the same time, Farm Bureau is calling for clearer guidance on when haulers of agricultural commodities are exempted from hours of service regulations. Federal rules exempt haulers from hours of service regulations when transporting agricultural commodities within 150 air miles of the source. According to Farm Bureau, the law says that livestock markets and grain elevators are considered a "source" of commodities but that point and others need to be clarified in federal guidelines to avoid confusion among farmers, haulers and law enforcement.

From Farm Bureau Express, Penna. Farm Bureau, March 9, 2018.

Farm Bureau Urges President to Keep Renewable Fuels Mandate

Farm Bureau and five other national agriculture groups are urging President Donald Trump to maintain federal requirements that ensure ethanol and biodiesel are blended into the nation's fuel supply. The groups made their case in a letter prior to a meeting between Trump and senators on potential changes to the Renewable Fuel Standard. Farm Bureau and other groups urged Trump to reject any proposals that would undermine or weaken the biofuels requirement, saying that the law has been "a strong engine driving the rural economy" and has expanded and created markets for farmers, added jobs in rural America, given consumers more fuel choices and improved air quality. "By any measure, the RFS has been successful not only for agriculture, but for our nation," the groups wrote. "This growth has slowed, however, in the face of past government policies and oil industry opposition." The agriculture groups also noted that as farm income and the agricultural economy have declined, the oil industry (which would benefit from shifting fuel content away from biofuels) has experienced a financial boom.

From Farm Bureau Express, Penna. Farm Bureau, March 9, 2018.

In Memory

We inadvertently missed including several obituaries in the February newsletter that should have been included there.

Josiah David Stahl

Josiah David Stahl, 25, of Paxinos, passed away Thursday, Jan. 11, 2018, at his residence.

Josiah entered this world as a little peanut on Jan. 3, 1993. Even then his muscles were very well pronounced. He was a happy baby, always waking with a smile and babbling to himself for hours. He loved his Thomas train and his Matchbox toys.

As he got older, he spent many hours on the trampoline creating more stunts to amuse us all. His Saturdays were happily spent at the river lot swimming, catching crayfish, playing king of the rock and later kayaking and rock climbing. He had a very tender heart and could always find good in people.

In high school, football and wrestling became his passions. He left home early every morning to go in with Coach Hock to lift, which he loved. He might not have gotten every play or move right, but he "left it all" on the field or the mat.

His life since high school was somewhat of a struggle, with many doubts and miscues. He failed to realize the depths of God's love for him and to experience the stability that He can bring to life.

His mom and dad were privileged to enjoy working with him in the family business. He especially loved making up unique hanging baskets and planters.

He will be sadly missed by his dad and mom, George and Priscilla Stahl, of Paxinos; his younger brother, Caleb; his grammy, Joyce L. Stahl, of Sunbury; his maternal grandparents, Franklin and Dorothy Knapp, of Millbrook, New York; his long-time girlfriend, Krysta Thomas, of Elysburg; and myriad aunts, uncles and cousins.



In Memory

We inadvertently missed including several obituaries in the February newsletter that should have been included there.

Nona G. Brown

Nona G. (Wright) Brown, 82, died Saturday, January 6, 2018 at York Hospital. She was the wife of the late Stanley E. Brown, with whom she shared 63 years of marriage.

Born January 13, 1935 in Canton, Bradford County, Nona was the daughter of the late Wilbur and Mary (Mason) Wright. Her family moved to York County to operate Codorun Farms, near Indian Rock Dam, in her teen years and she went on to graduate from West York High School. Nona and Stan met while attending York Junior College and married on May 29, 1954 at Zion Evangelical and Reformed Church in York.

Nona finished her teaching degree at Millersville State Teachers College, graduating in 1955. Following Stan's tenure in the Army, they moved to Loganville to assist with the family business. Nona taught elementary school for several years in Seven Valleys before assuming a full-time role working alongside her husband at Brown's Orchards. The impact of her contributions continue to be seen and felt today through the warm, welcoming atmosphere, beautiful signs and displays, and the children's educational programs at Brown's Farm Market.

Nona was actively involved in the community. She was an organizational leader for the Loganville 4-H Club for many years, taught Sunday School at Zion U.C.C., and volunteered with Contact York. She also served on the Susan P. Byrnes Health Education Center Board of Directors from 2002-2005 and was an active member of Emanuel United Methodist Church in Loganville, where she shared her beautiful voice as a

member of its music ministry. Nona and Stan were honored to receive the 2015 Susan P. Byrnes Health Education Center Founder's Celebration of Life Award and the 2016 Scott Brown Memorial Seeds of H.O.P.E. Award.

Nona had a passion for teaching children about farming and healthy eating. She was deeply committed to serving others, and valued time spent with family and friends. She will be remembered most for her loving smile, beautiful handwriting, joy for music, and appreciation for the simple things in life.

Nona is survived by her daughter-in-law, Brenda A. Brown, wife of the late Scott E. Brown, along with their children, Amanda S. Lighty and her husband, Jared A. Lighty and their daughter, Alyssa J. Lighty, and Travis S. Brown and his wife, Kayla M. Brown and their daughters, Hailey M. Brown and Grace C. Brown; her daughter, Linda C. Krupa and her husband, Nicholas E. Krupa, along with their children, Elena C. Krupa, Erin E. Bertke and her husband, Jordan T. Bertke, and Matthew R. Krupa; a son, David A. Brown and his wife, Mary I. Brown and their sons, Scott D. Brown and Sean A. Brown; her sister-in-law, Marjorie Wright; brothers-in-law, Richard H. Brown and his spouse, Lynn R. Spoor, and Roger L. Brown and his wife, Peggy A. Brown; and many nieces and nephews. She was preceded in death by siblings, Ella Lorene Hawthorne, Charles A. Wright, Frances Anderson and Robert M. "Bob" Wright.

In lieu of flowers, memorial contributions in Nona's name may be made to Emanuel United Methodist Church, PO Box 484, Loganville, PA 17342 to benefit its music ministry or to the Byrnes Health Education Center, 515 S. George St., York, PA 17401 (byrneshec.org/giving).

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NEWS

In Memory (continued from page 7)**David A. Brown**

David A. Brown, 53, died Thursday evening, March 1, 2018 at WellSpan York Hospital. He was the loving husband of Mary I. Babbo-Brown with whom he shared 13 years of marriage, and the proud father of Scott and Sean Brown. Born March 22, 1964 in York, Dave was the son of the late Stanley E. and Nona G. (Wright) Brown

He attended Loganville Springfield Elementary School and graduated from Dallastown High School where he excelled in marching band, was a member of the concert and stage bands, and was known for his intelligence, musicianship, and gregarious personality. He went on to graduate from Indiana University of Pennsylvania where he played trumpet in the marching band and completed his major in management information systems. Dave then began a successful career in information technology as a software developer, working with global corporations such as Black and Decker, Anheuser-Busch, Drinks.com, Hitachi and PepsiCo. While living in Chicago, Dave met the love of his life, Mary Babbo, at the Taste of Randolph Street in 2002, and they married on April 24, 2004.

In 2006, Dave's older brother, Scott, passed away after a brave fight against brain cancer. The Brown family matriarch, Nona, then appealed to Dave to return home and work alongside his parents in the family business. He began by running Brown's Orchards and Farm Market behind the scenes, applying the acumen he gained in international business operations and technology consulting, and went on to become a third-generation owner/operator of the fruit growing business his grandfather began in 1948.

Firmly ensconced in the community and in nurturing the family business, Dave and Mary grew their own family and welcomed Scott in 2008 and Sean in 2010. Dave's family became his world, as he threw himself into fatherhood and in to every activity in which his children were involved, including Tee-Ball, Karate, Baseball, Soccer, and Basketball. He was the greatest fan of the Dallastown Green Machines, Dallastown Predators, Dallastown Rink A and York Catholic Irish Baseball teams, and attended every practice and game he could to encourage, photograph and take video of the team members. Dave treated each child as his own, relished their every achievement, and shared their pain in defeat.

Dave had a great passion for music of all genres and began to instill in his boys that same love. He patiently practiced piano, violin and viola with them almost daily, and hoped that one day, they might also be interested in playing the trumpet and joining the marching band he so loved. He was also a lifelong fan of Penn State Football and shared his passion for the sport particularly with his oldest son, Scott. Dave was always willing to lend a hand and was an active volunteer with many York area community organizations. He was a member of St. Joseph Roman Catholic Church in Dallastown and always made his spiritual life a top priority. There were no strangers in Dave's life, as he considered everyone a friend. He will be dearly missed.

In addition to his wife and children, Dave is survived by his beloved sister, Linda (Brown) Krupa and her husband, Nicholas, and their children, Elena, Erin (Krupa) Bertke and her husband, Jordan, and Matthew; his sister-in-law, Brenda Brown, wife of his late brother, Scott E. Brown, and their children, Amanda (Brown) Lighty and her husband, Jared, and their daughter, Alyssa, and Travis Brown, his wife Kayla, and their daughters, Hailey and Grace; sister-in-law, Annamaria Cherian and her

husband, Snehit, and their daughters, Josephine, Leela and Ciara; sister-in-law, Giovanna C. Hobbs and her husband, Drew; brother-in-law, Dr. Angelo Babbo and his wife, Robin, and their children, Andrew, Mario, Anthony and Molly; brother-in-law, Martin (Frankie) Babbo and his wife, Amy, and their children, Querina, Lorenzo, Max, Daniel, Peter and Caroline; brother-in-law, Thomas Babbo and his wife, Heidi, and their children, Mary Grace, Joseph, John and Charlie; and many loving aunts; uncles; cousins; and beloved friends. In addition to his brother and parents, Dave was preceded in death by his mother-in-law, Mary Jo (Hamrock) Babbo; and his father-in-law, Joseph T. Babbo, who adored him.

In lieu of flowers, memorial contributions in Dave's name may be made to The Brown Children Education Fund, Attn: Timothy Bupp, CGA Law Firm, 135 N. George Street, York, PA 17401.

William Miles Hanna, Jr.

William ("Bill") Miles Hanna, Jr., 73, of Whiteford, Maryland, died peacefully after a brief illness on Saturday, March 10, 2018.

Mr. Hanna was born in 1944 to the late W. Miles Hanna and Carolyn Whiteford Hanna. Having attended Slate Ridge Elementary School and North Harford High School, he graduated from Charlotte Hall Military Academy in Charlotte Hall, Maryland in 1962. Upon graduation, he attended the University of Maryland at College Park and joined the United States Air Force, where he engaged in Counter-Intelligence and was honorably discharged in 1967 as an A1C.

At that time, he returned home to run the family-owned Whiteford Packing Company as President from 1967 to 1988. Mr. Hanna took great pride in having employed much of the community in various capacities at the Packing Company. While he semi-retired in 1988, he merely shifted his focus laterally to his Quigley Farm as a fresh-market vegetable grower of primarily green beans, sweet corn and asparagus. Together with his family, Mr. Hanna enjoyed all of the friendships he made over the years at the Bel Air Farmers Market, his family's farm stand, and wholesaling vegetables.

Mr. Hanna was an avid hunter, waterman, and land conservationist. He enjoyed a peaceful sunrise, whether it was in his tree stand, goose pit, farm field, or on the water. The weather was his compass which guided his everyday journey. He was well known and respected in the surrounding communities. But, most of all, he had a heart of gold, a true love for the land, and a passion for his family...most particularly his beloved granddaughter, Brooke, who affectionately called him "Dadu."

A proponent of the community, Mr. Hanna served on many boards and associations. He was a past president and director of the Harford County Farm Bureau, past president and director of the Mid-Atlantic Food Processor's Association, past member of the Maryland Agricultural Commission appointed under Governor William Donald Schaefer representing food processors and again under Governor Martin O'Malley representing the vegetable industry, member of the Maryland Vegetable Growers Association, member of the Pennsylvania Vegetable Growers Association, past president and director of the Whiteford-Pylesville-Cardiff Community Council, past director of the Mason Dixon Business Association, past director and president of the Bel Air Farmers Market, past director and member

(continued on page 11)

Is Your Farm Exempt from the FSMA Produce Safety Rule?

The Pennsylvania Vegetable Marketing and Research Program asked Pennsylvania growers whether their operations were exempt from meeting the requirements of the Food Safety Modernization Act (FSMA) Produce Safety Rule. The results were as follows: Yes – 23% No – 19% - the rest (or 58%) were not sure if they were or were not exempt. With over half of Pennsylvania growers being unsure of whether they are exempt, some clarification of the exemption criteria is needed.

The Produce Safety Rule is one of the new federal food safety regulations written under FSMA. Fruits, vegetables, mushrooms, and sprouts covered under this regulation includes only those that are 1) likely to be eaten raw, and 2) grown on farms with average annual produce sales of at least \$25,000. Exemptions to the rule, where only certain parts of the regulation are required, are available to certain growers based on average annual food sales and marketing channels.

Penn State Extension has developed an interactive Produce Safety Rule Coverage and Exemption tool at <https://extension.psu.edu/fsma-produce-safety-rule-coverage-and-exemption-tool> that will take you through a series of questions to determine how the rule affects you, and what you need to do to comply. Additional information and resources are provided at the end of the questionnaire to help you with next steps.

While the online interactive version is preferable, we have transcribed the questions below to allow those without access to the internet to work through the questionnaire. Further written information is available from your Penn State Extension office. We will also be publishing a series of articles in the com-

ing issues of the Pennsylvania Vegetable Growers News.

Question 1

Does your farm have average annual fresh produce sales over the last 3 years of at least \$25,000 (\$27,199 in 2017-2018 dollars)?

Yes - Some of your produce might be covered under the FDA Produce Safety Regulation. See question 2.

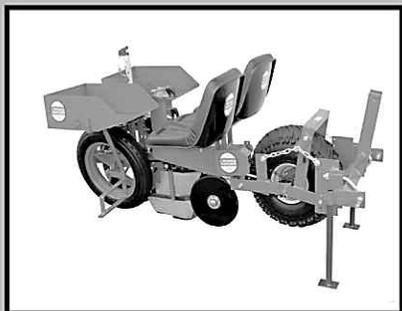
No - Your produce is not covered and your farm is not affected by the regulation. However, check with your buyers to see if they have any farm food safety documentation requirements.

Question 2

Do you grow any fruits or vegetables for commercial sale that are likely to be eaten raw by the consumer? *Most fruits and some vegetables fall into this category. Even if the produce could be consumed cooked, if it is frequently consumed raw (i.e. carrots), it would fall into this category. The FDA has determined that the following crops are "rarely consumed raw" and thus are NOT covered under the Produce Safety Rule: Asparagus; beans, black; beans, great Northern; beans, kidney; beans, lima; beans, navy; beans, pinto; beets, garden (roots and tops); beets, sugar; cashews; cherries, sour; chickpeas; cocoa beans; coffee beans; collards; corn, sweet; cranberries; dates; dill (seeds and weed); eggplants; figs; gin-*

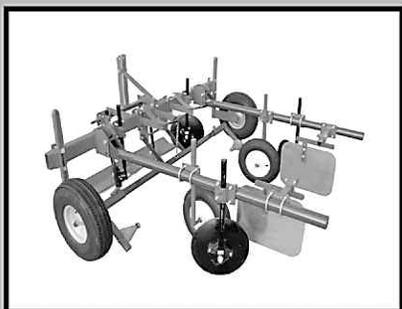
(continued on page 10)

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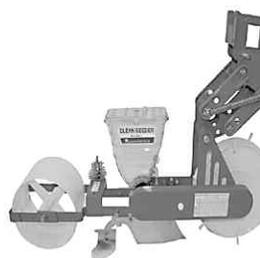
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GENERAL

Is Your Farm Exempt... (continued from page 9)

ger; hazelnuts; horseradish; lentils; okra; peanuts; pecans; peppermint; potatoes; pumpkins; squash, winter; sweet potatoes; and water chestnuts. If you grow any produce crops not listed above, answer "Yes".

Yes - Some or all of the produce you grow is covered under the FDA Produce Safety Regulation. See question 3.

No - Your produce is not covered and your farm is not affected by the regulation. However, check with your buyers to see if they have any farm food safety documentation requirements.

Question 3

Is any or all of the produce grown on your farm sold to commercial processors, such as a cannery or freezing operation?

Yes - Your farm is eligible for a processing exemption. You must get documentation from the processor proving that the process (retort, blanching, etc.) was adequate to eliminate harmful microorganisms and that none of that produce was later sold as fresh.

No - see question 4

Question 4

Is the dollar value of your farm's average annual food sales (includes produce plus grains, meat animals, eggs, milk, and packed or processed food products or animal feed products) over the last 3 years under \$500,000 (\$543,998 in 2017-2018 dollars)?

Yes - see question 5

No - Your farm is not eligible for a qualified exemption. You must comply with the full requirements of the regulation, including attending an FDA approved certification workshop. The FDA considers you to be a larger business and you have until January 26, 2018, to comply. An additional two years is allowed for compliance with water standards. Always check with your wholesale buyers to determine if they have a farm food safety verification and documentation requirements as a condition of sale.

Question 5

Are over half of your farm's average total food sales (includes produce plus grains, meat animals, eggs, milk, and packed or processed food products) directly to consumers via a farm stand, farmer's market, CSA, or internet sales **AND/OR** to individual grocery stores (direct store delivery) or to individual restaurants that sell or serve your produce to consumers (not to other businesses) (note the grocery stores and restaurants must be in the same state or within 275 miles of your farm)?

Yes - Your farm is eligible for a qualified exemption. To obtain the

qualified exemption, you must be able to show records that prove average annual food sales for the past three years are under \$500,000 (\$543,998 in 2017-2018 dollars) AND that your buyers meet the location requirements.

No - Your farm is not eligible for a qualified exemption. You must comply with the full requirements of the regulation, including attending an FDA approved certification workshop. See question 6.

Question 6

Which of the following best describes your total produce sales?

\$27,199 to \$271,199 - The FDA considers you to be a very small business and you have until January 26, 2020, to comply. An additional two years is allowed for compliance with water standards. Always check with your wholesale buyers to determine if they have a farm food safety verification and documentation requirements as a condition of sale.

\$271,199 to \$543,998 - The FDA considers you to be a small business and you have until January 26, 2019, to comply. An additional two years is allowed for compliance with water standards. Always check with your wholesale buyers to determine if they have a farm food safety verification and documentation requirements as a condition of sale.

More than \$543,998 - The FDA considers you to be a larger business and you have until January 26, 2018, to comply. An additional two years is allowed for compliance with water standards. Always check with your wholesale buyers to determine if they have a farm food safety verification and documentation requirements as a condition of sale.

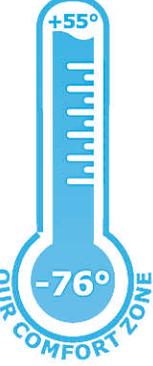
From FSMA Produce Safety Rule – Coverage and Exemption Tool, Penn State Extension, <https://extension.psu.edu/fsma-produce-safety-rule-coverage-and-exemption-tool>.



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NEWS

Peter Salerno III... (continued from page 1)

that were offered for sale at his roadside stand. In addition, he operated a 13 member CSA. In 2017 PJ's vegetable production continued to grow. His CSA membership doubled to 26 members and in addition to his roadside stand, he produced enough vegetables to sell at two area farmer's markets. All of the vegetables were grown from seeds which he started in his 1000 square foot greenhouse. Fall was an exciting time for PJ as he started a fall festival with a 5 acre corn maze and a 1 acre pumpkin patch. Next fall he plans to increase his pumpkin production and grow his own mums.

2018 looks to be a big year for PJ as he is adding a 3 bay, 300' x 75' high tunnel to the farm. He will also be taking over production of a neighboring 1/4 acre blueberry patch. Foothill Farm has also entered into an agreement with Delaware Valley University's Organic Farming Program to host students for their farm practicums. Finally, PJ will serve on the Penn State Extension Carbon County Council.

PVGA Young Grower Award recipients must be PVGA members who are 35 years old or younger, who have been successfully growing vegetables, potatoes or berries for less than five years 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. The prize is free registration for the Mid-Atlantic Fruit and Vegetable Convention plus lodging at the Hershey Lodge. To nominate a young grower you think should be recognized (or yourself) send a brief but comprehensive description of the farm operation and the nominee's qualifications to PVGA at pvga@pvga.org or 815 Middle Road, Richfield, PA 17086, by November 30, 2018.

In Memory (continued from page 8)

of Whiteford Volunteer Fire Company, past member of Delta-Cardiff Volunteer Fire Company, past member of the Harford County Property Tax Assessment Appeals Board appointed by Governor Parris Glendening, past board member of the Harford County Ag Advisory Board appointed by Harford County Executive James Harkins and Harford County Executive David Craig, past Director and vice president of Warren's Park Community in Ocean City, Maryland, and a member of Slate Ridge American Legion Post 182.

He is survived by his wife, Donna Olson Hanna, with whom he was married for 46 years; his daughter, Amy Hanna Steiner, and her husband, Todd Steven Steiner, of Delta, Pennsylvania; a sister, Susan Hanna Martin, and her husband, Robert S. Martin, of Whiteford, Maryland; nieces, Megan Martin Holden, of Bristow, Virginia, and Jane Martin Marchand, of Cary, North Carolina, and their families; and most belovedly his granddaughter, Brooke Hanna Steiner, of Delta, PA.

Memorial contributions may be made to Mason Dixon Community Services, 5 Pendyrus Street, Delta, Pennsylvania 17314 (717.456.5559).



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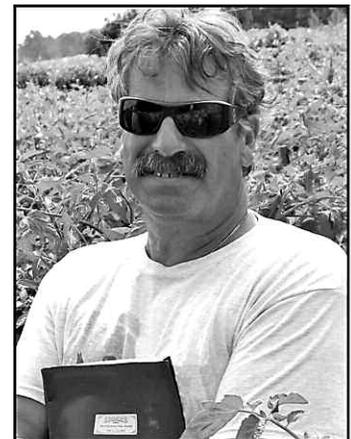
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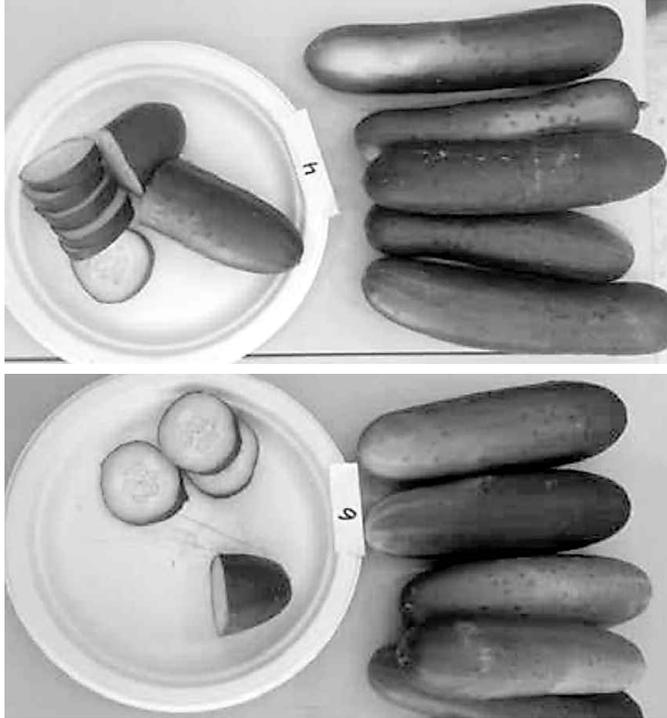
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VEGETABLE PRODUCTION

Growing Cucumbers in the Downy Mildew Age

Susan B. Scheufele

Many growers remember the “good ole days” when you could pick cucumbers into the fall and even until the first frost. Nowadays cucumber plants go down much earlier, around mid-August to early-September, when the leaves suddenly turn yellow, then brown, and shrivel up. These are telltale symptoms (along with a furry or crusty dark brown to gray sporulation on the undersides of the leaves) of cucurbit downy mildew, a disease caused by the oomycete *Pseudoperonospora cubensis*.



Bristol (top) and NY264 (bottom). The best yielding cucurbit downy mildew resistant varieties two years in a row in UMass Extension Vegetable Program trials conducted by Sue Scheufele and gang.

The disease affects all cucurbit crops and can cause sudden and complete death of foliage, effectively ending the cucumber season. This pathogen is an obligate parasite, meaning it needs a living host to survive. Thus, the disease overwinters in Florida where cucumbers are grown throughout the winter, and works its way north as the growing season progresses. There are several strains that affect different crops, but all strains affect cucumber, making them the most susceptible crop to the disease.

The disease was controlled for decades because all cucumbers carried a resistance gene, but in 2004 the pathogen evolved and overcame that resistance and now there is a great effort to breed new varieties with alternative sources of disease resistance. Here at University of Massachusetts we have been evaluating some of these new varieties to see how they hold up in Massachusetts, and looking at the economics of using host resistance and/or spraying fungicides (organic or conventional). For these trials we focused on slicing cucumbers but hope to continue looking at other types in the future.

Evaluating Resistant Cucumber Varieties. We compared 6-8 varieties in 2016 and 2017 with four replications of each variety organized in randomized complete blocks so that we could

determine significant differences between varieties. We planted four-week-old seedling into black plastic mulch with drip irrigation during the last week of June and started harvesting on August 5 in 2016 and on July 25 in 2017. The growing seasons of these two years were very different, with 2016 being very hot and dry with low downy mildew pressure and 2017 being relatively cool and wet with high disease pressure. Additionally, in 2017, the pathogen arrived on August 1, two weeks earlier than in 2016. In 2016 we had an unexpected outbreak of watermelon mosaic virus which drastically reduced marketable yield of the susceptible control ‘Straight 8’, while other varieties were unaffected. We measured disease severity and marketable yield every week and summed them up over the season. Figure 1 shows the area under the disease progress curve (AUDPC—a higher number means more disease over time) and marketable yield per acre. Bristol, DMR401, and NY264 had among the lowest disease severity and the highest yields in both years. Diamondback, Python, and SV4719CS performed better than the susceptible control but not as well as the other resistant varieties. Green Bowl had terrible yields and therefore won’t be commercialized.

Economics of Integrated Disease Management. In the second set of experiments, we investigated the economics of different management strategies, and compared one resistant and one susceptible variety under two fungicide spray programs, one organic and one conventional. We setup plots of susceptible (Straight8) or resistant (SV4719CS) cucumbers in random-

(continued on page 13)



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VEGETABLE PRODUCTION

Growing Cucumbers... (continued from page 12)

Cultivar	Seed Supplier	Downy Mildew AUDPC ^Z		Total Marketable Yield (lb/A) ^Y		Last Harvest Date	
		2016	2017	2016	2017	2016	2017
Straight Eight (Susceptible control)	Burpee	16.4 a	2418.8 a	18,391 d	8,826 cd	2-Sep	22-Aug
SV4719CS	Seminis	8.1 b	1345.0 b	28,826 c	15,522 abc	9-Sep	29-Aug
Green Bowl	Known-You	3.7 d	134.2 c	22,696 cd	5,522 d	13-Sep	22-Aug
Bristol	Seminis	7.1 bc	419.4 c	40,652 ab	17,348 ab	13-Sep	4-Sep
DMR401	Commonwealth Seeds	5.7 c	1249.4 b	32,435 bc	19,913 a	9-Sep	4-Sep
NY264	Commonwealth Seeds	0.6 e	175.9 c	53,217 a	17,261 ab	30-Sep	11-Sep
Diamondback	Seedway	na	1426.3 b	na	12,217 bcd	na	1-Sep
Python	Seedway	na	1391.3 b	na	14,957 abc	na	4-Sep
p-value		<0.0001	<0.0001	0.0005	0.0087	--	--

^ZData were analyzed using a generalized linear model and means were separated using Tukey's HSD at alpha = 0.05. Numbers within each column which share the same letter are not significantly different from each other.

^YTotal yield was recorded twice weekly and is here summed across the whole season.

When we look at the marketable yield data (Figures 3 and 4), the two years were not as consistent. In 2016, the resistant variety treatments yielded significantly higher than the susceptible varieties. This was due to a virus that affected the susceptible variety, Straight 8, and not the resistant variety, SV4719CS, drastically reducing marketable yield of Straight 8, and because the downy mildew pressure was

ized complete blocks and then applied one of the following spray treatments in a 5-7 day spray schedule once disease was confirmed in the area:

- **Unsprayed**
- **Conventional Spray:** Included a fungicide effective for powdery mildew (Torino, Procure, or Inspire Super) and a fungicide effective for downy mildew (Ranman or Tanos) in rotation and mixed with Bravo Weatherstick
- **Organic Spray:** Oxidate alone for powdery mildew before the arrival of downy mildew, and copper (NuCop HB) alone once downy mildew arrived.

In 2016, we sprayed 6 times before the plants went down. In 2017, because of the earlier arrival of downy mildew, we sprayed 9 times. We rated disease severity and marketable yield. Our disease severity results were very consistent between the two years (2017 results in Figure 1) and show that the conventional fungicides are the most effective tool in controlling downy mildew all season long, if you can spray every 5-7 days and have a good spray program with the right materials in rotation. Our data also shows that the resistant variety has significantly less disease than the susceptible variety, and that spraying copper does slow disease spread, especially in a drier year like 2016 when downy mildew came late.

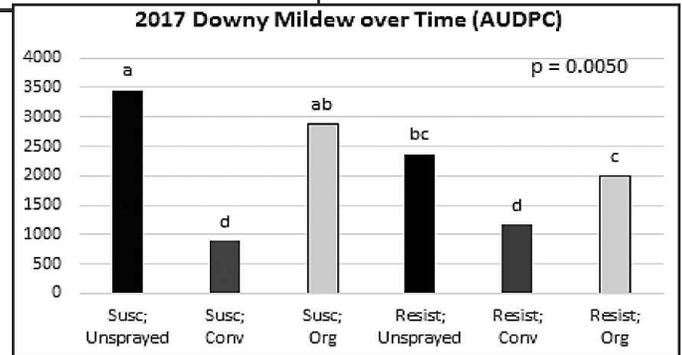


Figure 1

low, so the fungicides didn't give much of an advantage to the sprayed plants. In 2017, under very high disease pressure, the conventional fungicides were very effective at controlling disease; the highest marketable yield was achieved by spraying the susceptible variety with a conventional program. The susceptible and resistant varieties had very different yield potentials – the susceptible Straight 8 had a very high yield potential compared to the resistant SV4719CS, which was not a prolific producer even under the best conditions. Looking at the yield of the

(continued on page 14)

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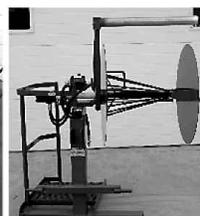
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VEGETABLE PRODUCTION

Growing Cucumbers... (continued from page 13)

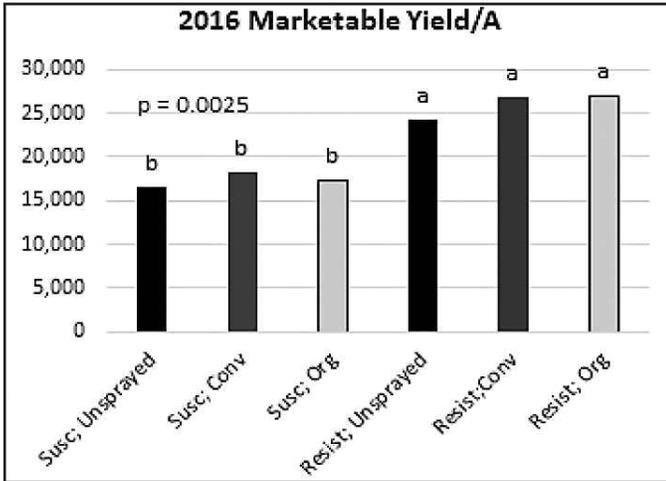


Figure 3

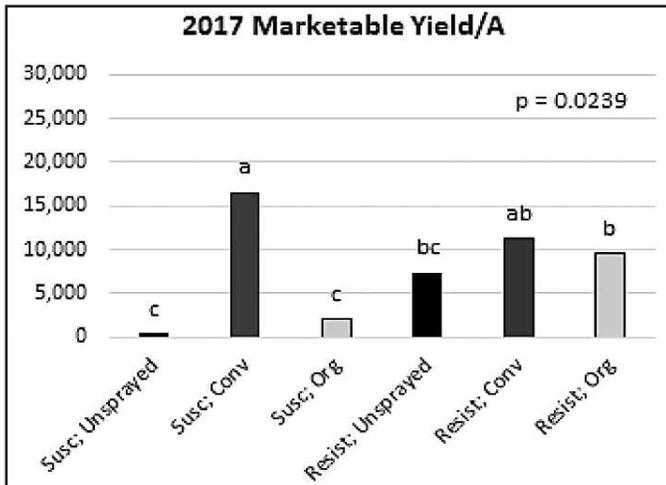


Figure 4

resistant variety, it was fairly consistent year to year despite the very different conditions, and the fungicide treatments made no statistical difference in yield compared to the unsprayed treatment.

When we looked at the profitability of the different management approaches, we found that some growers might find it is worthwhile to spray and get higher yields. If you don't have spray equipment, growing a resistant variety meant a profit margin of \$13,861 for conventional cucumbers or \$17,326 for organic cucumbers. The profit margin was greatest on the resistant variety with an organic spray program, and with a conventional spray program on the susceptible variety (Fig. 5). We calculated the cost for the entire season of the materials we sprayed for each treatment (\$400-\$700 for the conventional sprays and \$40 for organic), the labor (\$24/hr), and the sprayer tractor time (\$20/A) then subtracted that from the total sales assuming conventional cucumbers could be sold for \$2/pound and organic cucumbers could be sold for \$2.50/pound.

Some conclusions about different disease

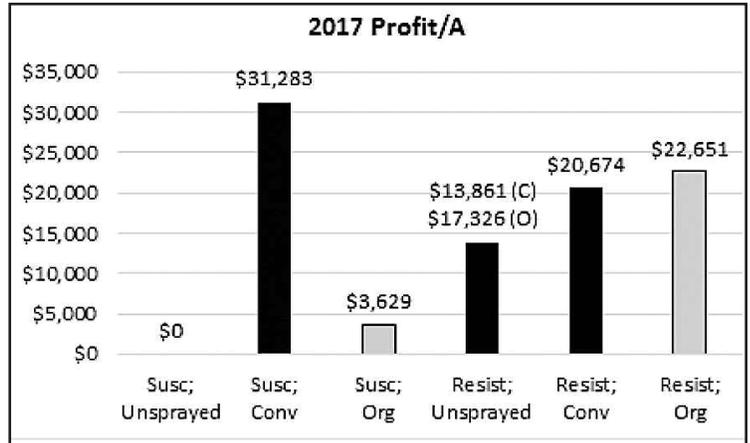


Figure 5 Profits are based on a conventional cucumber (C) price of \$2/pound and organic cucumber (O) price \$2.50/pound.

management approaches learned from this study are:

- If you plan to use conventional fungicides, have a good rotation program for downy and powdery mildew, and can spray every 5-7 days, then you should pick a high-yielding variety, regardless of susceptibility. Under these circumstances, we were able to harvest cucumbers until October 2nd.
- However, if you can't spray diligently, resistant varieties offer a very consistent and economical alternative that you may not need to spray at all. We picked our unsprayed resistant variety, SV4719CS, until September 15th—I wonder how late we could have harvested if instead we'd chosen NY264 or Bristol, knowing now that those have better resistance and yields?

This research was funded by a Specialty Crops grant from the MA Dept of Agricultural Resources.

Ms. Scheufele is with the Univ. of Massachusetts Extension Vegetable Program. From the **Vegetable Notes for Vegetable Farmers in Massachusetts**, Univ. of Mass. Ext., Vol. 30, No. 3, March 15, 2018.

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IPM for Clubroot of Brassica Crops

Angela Madeiras and Robert Wick

Clubroot is a soil-borne disease caused by the protozoan *Plasmodiophora brassicae*. Infection results in the formation of galls on the host roots. The deformation of the root system results in reduced uptake of water and nutrients. Plants become stunted and may wilt, particularly during the heat of the day. Severely infected plants collapse and die.



Clubroot galls on roots of a broccoli plant.

P. brassicae is a prolific organism. If it were a sphere, the period at the end of this sentence could hold about 200,000 resting spores. After germinating, the resting spore produces a zoospore which infects a root hair. In about a week, a plasmodium develops in the root hair which will produce about 5,000 secondary zoospores which can reinfect the root, or swim through soil moisture to other roots. In cool, wet soils, the organism can spread quickly. The disease is active in moist soil at temperatures of 50-86°F, with an optimum of approximately 68-77°F.

Clubroot is a difficult disease to control, and no single treatment will provide adequate management. An integrated pest management program is the most effective way to decrease the incidence and severity of clubroot in brassica crops. Important elements of an IPM program for clubroot are outlined below.

1. A four-year crop rotation is recommended as a precaution for all brassica crops, and if clubroot is actually detected in the soil, increase the time period to 7 years. Avoid all crops in the family Brassicaceae. In gardens and small farms, perhaps some arrangement could be made where brassicas are grown in another area in exchange for produce grown in the contaminated soil. The problem with continuing to grow brassicas in contaminated soil is that the pathogen population grows quickly. A clubroot gall can contain a bil-

lion resting spores which can survive in the soil for 10 or more years.

2. Acidic soils favor the disease. Raise the pH to 7.0-7.2. Apply hydrated lime 6 weeks before planting. An excellent reference is available at <https://catalog.extension.oregonstate.edu/em9057>
3. Raise transplants in a soilless medium so that they are free of disease.

(continued on page 16)

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VEGETABLE PRODUCTION

IPM for Clubroot... (continued from page 15)

4. Grow tolerant cultivars. These include the cauliflower cultivars 'Clapton' and 'Clarify', broccoli 'Emerald Jewel', and cabbage "Copenhagen". For more information, see <http://vegetablemndonline.ppath.cornell.edu/>. Understand that these cultivars are not completely resistant to clubroot. There are at least 8 different races of the pathogen and resistant cultivars will not be resistant to all the races.
5. Pentachloronitrobenzene (PCNB; Blocker 4F), fluazinam (Omega 500F), and cyazofamid (Ranman) are labeled for clubroot management and should provide partial control.
6. The clubroot organism is primarily banded in the zone of soil where the galls decay. Removing that band of soil will remove most, but not all, of the resting spores. Keep in mind that this band of soil is your most fertile layer.
7. Wet, cool soils favor the disease. Choose fields with good drainage for brassica crops, or grow them in raised beds.
8. The pathogen can be spread by movement of infested soil to uninfested fields. Clean equipment fastidiously after using it in contaminated soil and before using it in non-contaminated soil.
9. Carefully remove infected plants from the soil so that no root tissues remain. Infected plant material should be buried at least 12" deep, or removed from the site entirely.
10. Control cruciferous weeds, which are also susceptible to clubroot infection.
11. Bait crops have been used to force resting spores to germinate. Research trials have shown a variety of results from excellent to poor. Broadcast an inexpensive, susceptible



A broccoli field infected with clubroot.

brassica seed over the area. Allow growth for 4 weeks and then turn under the crop. The idea is to turn it under before resting spores develop.

*Ms. Madeiras and Mr. Wick are with the Univ. of Massachusetts Extension. From **Vegetable Notes for Vegetable Farmers in Massachusetts**, Univ. of Mass. Ext., Vol. 30, No. 2, February 15, 2018.*

NEWS

Steve Johnson is New Seedway Rep

Steve Johnson has accepted the position of SEEDWAY Vegetable Seed Sales Representative for the Ohio, West Virginia, Western Pennsylvania and Western New York territory.

As a veteran in the agriculture industry, Steve earned a Bachelor of Science in Agricultural Science from Wilmington College and brings 25+ years of sales and management experience in the chemical and fertilizer industry most recently working as an Ohio Sales Representative for Miller Chemical and Fertilizer.

In his role, Steve will provide SeedWay commercial vegetable seed customers throughout the territory with personalized seed recommendations and the highest quality service identifying product needs and solutions for the individual customer.

A southern Ohio resident, Steve has a strong desire to support growers within the vegetable industry. In his off time you can find Steve exploring the great outdoors through snowboarding, hiking and most often when weather permits, partaking in any activity that involves being on the lake and his boat!

To reach Steve you can email him at sjohnson@seedway.com or by cell at 716-570-1871.

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Hot Water Treatment for Tomato and Pepper Seeds

Lee Stivers and Beth Gugin

We have fielded a number of questions this winter about using hot water treatments for tomato and pepper seeds.



Pepper plants. Photo: Lee Stivers, Penn State

This article summarizes these recent conversations, and includes updates on equipment selection and use.

Why hot water treat tomato and pepper seeds?

Bacterial diseases of tomato and pepper are difficult to manage, and can cause significant crop loss in Pennsylvania. Common bacterial infections of tomato include bacterial speck (*Pseudomonas*), bacterial spot (*Xanthomonas*) and bacterial canker (*Clavibacter*). Pepper is also susceptible to bacterial leaf

spot (*Xanthomonas*). An integrated management plan for reducing losses due to bacterial diseases of tomato and pepper includes:

- field rotation
- clean seed
- greenhouse sanitation
- in-field practices to minimize disease incidence and severity

Heat treatment is an effective practice in assuring that seeds are not contaminated with these pathogens, or are "clean." Growers can purchase seed that is already hot-water treated, or can treat the seed themselves by following a specific procedure. A less effective alternative is to treat seeds with chlorine, but this only kills pathogens on the surface of the seed coat, and doesn't reach bacteria embedded within or under the seed coat. Chlorine treatment is not always reliable, especially for canker, which is known to become embedded within or under the seed coat.

Procedure for treating tomato and pepper seeds

Only treat seed you will use that year. Do not treat seed that has already been treated; this should be stated on the seed packaging. Do not treat seed that is pelletized or already fungicide treated. The 2018 Mid-Atlantic Commercial Vegetable Production Recommendations describes the recommended procedure:

"Seed heat treatment follows a strict time and temperature protocol and is best done with thermostatically controlled water

(continued on page 18)

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VEGETABLE PRODUCTION

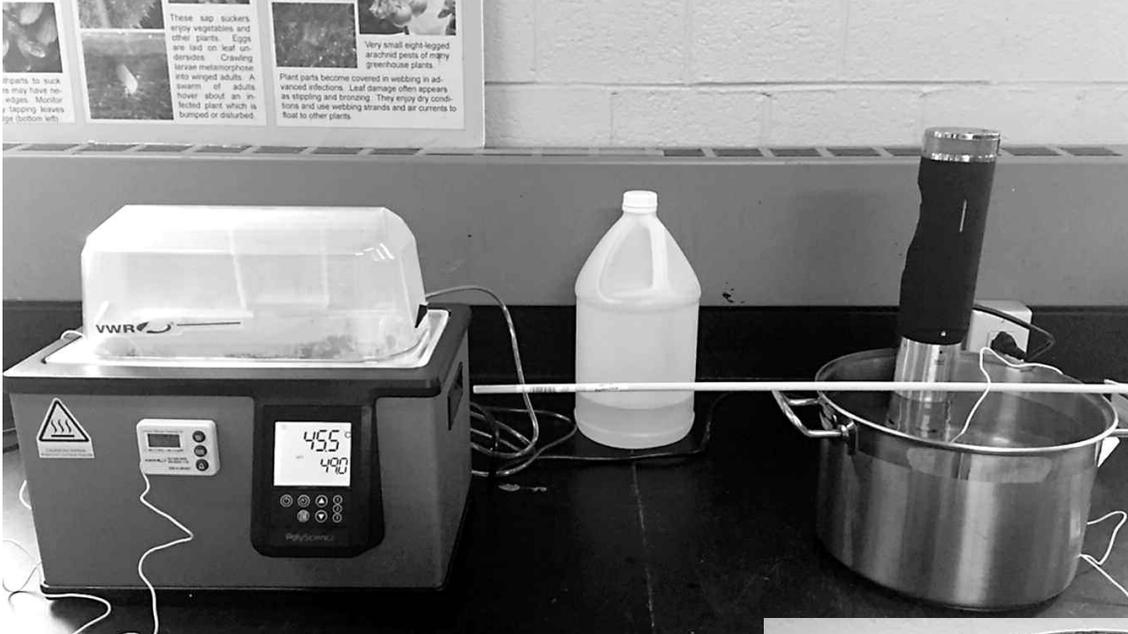
Hot Water Treatment... (continued from page 17)

Photo 1. Full heat treatment set-up.
Photo: Beth Gugino, Penn State

baths. Two baths are required: one for pre-heating, and the second for the effective (pathogen killing) temperature. For pepper seed, the initial pre-heating is at 100°F (38°C) for 10 minutes, followed by the effective temperature of 125°F (52°C) for 30 minutes. For tomato seed, the initial pre-heating is at 100°F (38°C) for 10 minutes, followed by the effective temperature of 122°F (50°C) for 25 minutes. Immediately after removal from the second bath, seeds should be rinsed with cool water to stop the heating process. After that, seeds should be dried on a screen or paper.”

Note that the procedure is the same except that pepper seed is held at a higher temperature and for a longer time period than tomatoes.

Equipment and supplies to treat your own seeds

Seeds must be placed into pouches before treatment. Cone-style coffee filters, clipped at the top, are frequently used. Others have used pouches made from window screening, or tea infusers. Make sure you tag the pouch! The seed should not go back into the original envelope once it is treated.

The set-up includes two water baths. The first water bath preheats the seed and the pouch(es) to a base temperature (100 to 110° F) and then the second water bath is used to actually treat the seed at a specific temperature. An alternative set-up for the first water bath is an immersion sous vide (see photo 2). This is a method of cooking food in a plastic pouch in water at a controlled temperature. It consists of a heater and a water circulator and clips to the side of a large pot.

Supplies:

- Distilled water
- Aquarium bubbler
- Roll of fiberglass window screen
- Coffee filters
- Weights (such as metal nuts or coins)
- Plastic labeling stakes and permanent markers

Equipment:

- Two water baths or one water bath and one sous vide Thermometer
- Small aquarium pump with tubing and bubbling stone

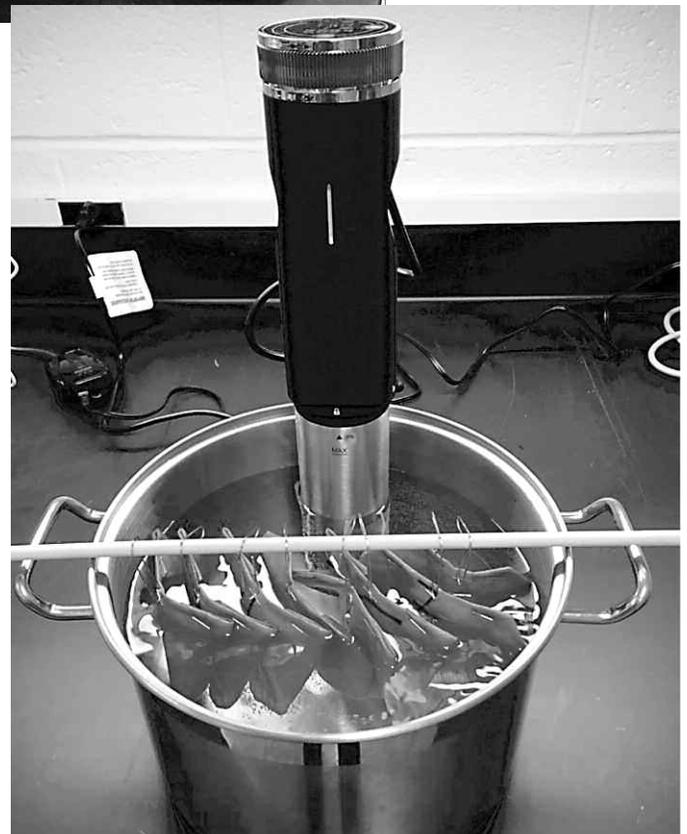


Photo 2. Sous vide – first water bath. Photo: Beth Gugino, Penn State

Equipment model examples:

Sous Vide Power Precision Cooker (\$70)
PolyScience 5 L General Purpose Water Bath (WB05A11B) (\$460)

VWR Digital Fridge/Freezer Thermometer (\$50) these are a little easier to manage than a glass thermometer but a glass cooking or candy thermometer will do.

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Hot Water Treatment... (continued from page 18)

Small aquarium pump, tubing and bubbling stone (total ~\$11) are widely available at stores selling pet and aquarium supplies.



Photo 3. Second water bath. Photo: Beth Gugino, Penn State

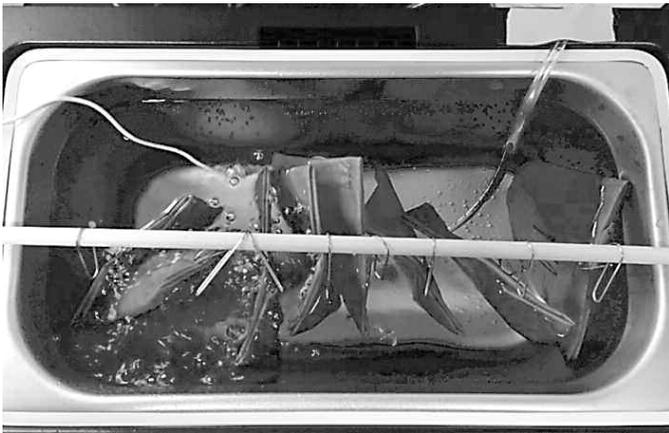


Photo 4. Seed packets in second water bath. Photo: Beth Gugino, Penn State

The temperature drops when I put the seed into the second bath. Is this a problem? The process is not so precise (i.e. it is robust enough) that a few tenths of a degree is going to affect the efficacy of the treatment process. So that means you should count the time that the seed is in the water bath even if it is a few tenths of a degree under the recommended temperature. You could also bump up the temperature in the first water bath to 110°F to help minimize the drop in temperature, or consider treating less seed at a time.

I treated some seed according to the recommendations and then they didn't germinate. Did the treatment injure the seeds? New, vigorous seed should not be damaged by proper heat treatment. However, seed quality can greatly impact the effect of heat treatment on seed germination. Old and weak seed often won't fair well after treatment. If you have reason to doubt the vigor of your seed, do a germination test before you subject it to a hot water treatment.

Ms. Stivers is with Penn State Extension in Washington Co. and Dr. Gugino is with the Penn State University Department of Plant Pathology and Environmental Microbiology. From Penn State Extension, <https://extension.psu.edu/hot-water-treatment-for-tomato-and-pepper-seeds>, March 26, 2018.

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VEGETABLE PRODUCTION

Statewide Pumpkin Cultivar Trials Results

Elsa Sánchez, Timothy Elkner, Thomas Butzler, Robert Pollock, William Lamont



Dr. Elsa Sanchez with some of the pumpkins from the cultivar trials at Rock Springs. Photo – William Lamont, Penn State

Selecting which cultivar to grow is critical to successful commercial production. When a cultivar suited to an area and having high yield and quality for market is grown, growers can make a profit. In 2016 we evaluated 15-25 lb orange, smooth-faced pumpkins. Pumpkins are an important crop for diversified vegetable operations in Pennsylvania. They are grown on 1,330 of Pennsylvania's 3,968 vegetable farms, ranking 1st in number of farms the US (2012 Census of Agriculture).

The study was conducted in southwestern Pennsylvania at Yarnick's Farm, LLC in Indiana, in central Pennsylvania at Pennsylvania State University's Russell E. Larson Research Center in Pennsylvania Furnace and, in southeastern Pennsylvania State University's Southeast Research and Extension Center in Manheim.

Twenty-one pumpkin cultivars (see Table 1 below) were evaluated in a conventional system in 2016-17. All seed was treated with Farmore except 'Camaro' seed which was untreated.

At all sites, pumpkins were direct seeded. At the southwestern site rows were spaced 6 feet apart with 3 feet between plants and at the central and southeastern site row were spaced 8 feet apart with 4 feet between plants in a row. Four plots of each cultivar were planted with each plot consisting of 6 plants. Data were collected from all 6 plants.

Pests were managed following recommendations in the 2016 Commercial Vegetable Production Recommendation guide.

The standard used was 'Gladiator' based on conversations with growers.

At the southwestern site a raised bed system without plastic mulch was used. When beds were pulled, 600

lb/acre of 13-13-13 was applied through the bedmaker. Direct seeding occurred on June 25, 2016 and June 20, 2017. A single line of drip tape was installed over each bed to use only in the event the crop needed to be saved as there wasn't a pond at this site. In 2016, irrigation was used to get the crop started. Pre-emergent herbicide was applied.

Pumpkins were harvested on October 8, 2016 and October 10 and 13, 2017 and were categorized as fully orange, turning orange, mature green and unmarketable. Quality of the handles was also determined at this site.

At the central site, potash, and phosphate were applied based on soil test recommendations. Additionally, 50 lb/acre nitrogen was broadcast preplant on 23 May 2016 and 12 June 2017. An additional 25 lb/acre nitrogen was fertigated throughout the growing season. At this site a plasticulture system using a single line of drip tape (T-Tape model 508-12-450; John Deere, Moline, IL) placed on the center of the bed and black embossed plastic mulch (Sigma Plastic Groups, Allentown, PA) was used. Beds were pulled and plastic and drip tape were installed on June 10, 2016 and June 12, 2017. Plants were provided with 1-1.5 acre-inches of water each week through drip irrigation. Herbicide was also applied on June 10, 2016 and June 13, 2017. Planting holes were punched and direct seeding occurred on June 13, 2016 and June 22, 2017.

Pumpkins were harvested on September 16 and 20, 2016 and cut on September 29 and harvested on October 5, 2017. Pumpkins were counted and weighed in these categories: fully orange, turning orange or mature green (full sized and dark green) and unmarketable. Immature green fruit were left in the field.

(continued on page 21)

Table 1. Cultivars, seed sources, maturity date of cultivars evaluated in 2016-17.

Cultivar	Source	Maturity ²
Ares	Harris Moran Seed Co., Davis, CA	115
Bayhorse Gold	Rupp Seeds Inc., Wauseon, OH	100
Camaro	Hollar Seeds, Rocky Ford, CO	110
Cargo	Johnny's Selected Seeds, Winslow, ME	100
Challenger	Hollar Seeds, Rocky Ford, CO	100
Eagle City Gold	Rupp Seeds Inc., Wauseon, OH	100
Earlipak	Sakata Seed America, Morgan Hill, CA	95
Early King	Abbot & Cobb	90
Gladiator	Harris Moran Seed Co., Davis, CA	115
Gold Challenge	Rupp Seeds Inc., Wauseon, OH	105
Hannibal	Hybrid Seed Co., Feasterville, PA	105
Honky Tonk	Sakata Seed America, Morgan Hill, CA	105
Kratos	Harris Moran Seed Co., Davis, CA	100
Magic Lantern		110
Magic Wand		115
Mr. Wrinkles	Sakata Seed America, Morgan Hill, CA	100
Orange Rave	Rupp Seeds Inc., Wauseon, OH	105
Rhea	Harris Moran Seed Co., Davis, CA	105
Solid Gold	Rupp Seeds Inc., Wauseon, OH	100
Spartan	Sakata Seed America, Morgan Hill, CA	100
Zeus	Harris Moran Seed Co., Davis, CA	110

²Based on seed catalogs.

VEGETABLE PRODUCTION

Statewide Pumpkin... (continued from page 20)

At the southeastern site pumpkin seed were direct seeded in a no-till system into rye residue on June 7, 2016 and June 8, 2017. A single line of drip tape (T-Tape model 508-12-450; John Deere, Moline, IL) was placed in the center of each row. Plants were provided with 1-1.5 acre-inches of water each week through drip irrigation. Based on soil test recommendations, phosphate, and potash were not applied. Nitrogen was applied at a rate of 90 lb/acre with 50 lbs broadcast preplant and the remainder fertigated throughout the growing season.

Pumpkins were harvested on October 14, 2016 and October 11 and 16, 2017. At this site harvest occurred when all fruit was fully orange (no fruit was turning orange). Quality of the handles (stems) was rated at this site using a 1-5 scale with 5 indicating the highest quality.

Data were pooled by site and year and analyzed using the GLIMMIX. Means were separated at the 5% level using the slice option to perform Tukey's multiple comparison test.

Results

Significant interactions between year, site, and cultivar were observed for many variables as indicated in Table 2 below.

Table 2. Statistical interactions between site, year, and cultivar for 21 cultivars of pumpkin grown in 2016-17 in three locations in Pennsylvania. "*" indicates interaction significant at the 5% level, 'NS' indicates the interaction was not significant.

	Marketable yield (lb)	Marketable yield (no.)	Unmarketable yield (no.)
Site x year	*	*	*
Site x cultivar	*	*	NS
Year x cultivar	NS	*	*
Site x year x cultivar	NS	*	NS

Southwestern Site

Yields in 2016 were lower at this site because of stress early in the growing season. Planting was delayed due to very dry conditions, then dry weather post emergence through the 3rd week of July resulted in slow and uneven germination and growth. In 2017, extended wet weather created favorable conditions for phytophthora blight which limited yields.

Mean weight of marketable pumpkins for all cultivars was not different from 'Gladiator' or each other in both years (Table 3).

Mean number of marketable pumpkins for all cultivars was not different from 'Gladiator' or each other in both years.

Mean number of unmarketable pumpkins for all cultivars was not different from 'Gladiator' or each other in both years (Table 4).

Central Site

'Challenger' produced a higher mean weight of marketable pumpkins than 'Gladiator' in 2016. 'Early King' and 'Camaro' produced a higher mean weight than 'Gladiator' in 2017.

(continued on page 22)

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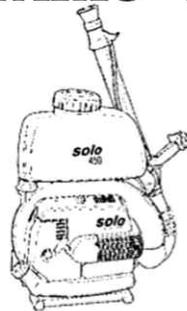
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VEGETABLE PRODUCTION

Statewide Pumpkin... (continued from page 21)**Table 3.** Marketable yield of 21 pumpkin cultivars grown at three locations in Pennsylvania in 2016-17.

Cultivar	Marketable Yield (lb)						Marketable Yield (no.)					
	Southwestern Site		Central Site		Southeastern Site		Southwestern Site		Central Site		Southeastern Site	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Ares	34 a ²	27 a	294 ab	285 abc	192 ab	257 ab	1.5 a	1.3 a	16.3 ab	11.0 ab	12.0 a	11 ab
Bayhorse Gold	58 a	57 a	223 ab	279 abc	164 ab	240 ab	2.8 a	2.8 a	13.3 ab	13.0 ab	12.5 a	11.3 ab
Camaro	41 a	77 a	310 ab	354 ab	152 ab	236 ab	1.8 a	5.3 a	13.3 ab	16.9 a	10.8 a	10.0 ab
Cargo	31 a	39 a	236 ab	230 abc	196 ab	208 ab	1.8 a	1.8 a	11.8 b	8.0 b	11.0 a	8.0 ab
Challenger	54 a	95 a	355 a	323 abc	286 a	247 ab	1.5 a	2.8 a	17.0 ab	10.5 ab	15.5 a	9.3 ab
Eagle City Gold	68 a	47 a	207 b	318 abc	131 b	269 ab	3.5 a	2.5 a	13.5 ab	15.3 ab	10.5 a	12.0 ab
Earlipak	23 a	15 a	234 ab	252 abc	174 ab	229 ab	1.0 a	1.0 a	13.3 ab	9.7 ab	10.3 a	8.5 ab
Early King	49 a	7 a	323 ab	366 a	247 ab	244 ab	1.8 a	0.5 a	15.0 ab	13.0 ab	14.8 a	9.0 ab
Gladiator	27 a	4 a	201 b	197 c	152 ab	233 ab	1.0 a	0.3 a	15 ab	9.5 ab	11.8 a	12.0 ab
Gold Challenger	33 a	28 a	210 b	221 bc	163 ab	139 b	1.5 a	2.0 a	11.5 b	11.0 ab	10.0 a	6.8 b
Hannibal	51 a	69 a	216 ab	200 bc	165 ab	175 b	2.0 a	3.3 a	13 ab	10.5 ab	10.3 a	8.3 ab
Honky Tonk	43 a	24 a	248 ab	250 abc	169 ab	209 ab	2.3 a	1.5 a	20.0 a	12.3 ab	13.8 a	11.3 ab
Kratos	58 a	48 a	277 ab	310 abc	196 ab	326 a	1.8 a	2.5 a	17.0 ab	12.8 ab	12.8 a	14.8 a
Magic Lantern	59 a	11 a	224 ab	282 abc	167 ab	182 ab	2.5 a	1.0 a	18 ab	14.5 ab	15.3 a	9.8 ab
Magic Wand	62 a	11 a	232 ab	235 abc	169 ab	218 ab	2.5 a	0.8 a	18.0 ab	11.5 ab	13.0 a	11.5 ab
Mrs. Wrinkles	83 a	0 a	183 b	267 abc	187 ab	191 ab	5.3 a	0.0 a	12.5 ab	12.3 ab	14.5 a	10.0 ab
Orange Rave	71 a	25 a	255 ab	268 abc	173 ab	224 ab	3.8 a	1.5 a	17.5 ab	12.8 ab	12.0 a	12 ab
Rhea	62 a	30 a	250 ab	261 abc	145 ab	259 ab	2.0 a	1.5 a	17.3 ab	9.8 ab	10.0 a	11.5 ab
Solid Gold	56 a	43 a	254 ab	275 abc	193 ab	230 ab	2.3 a	2.5 a	13.0 ab	10.8 ab	10.8 a	9.5 ab
Spartan	33 a	27 a	225 ab	286 abc	219 ab	225 ab	1.5 a	1.5 a	14.8 ab	10.5 ab	15.0 a	10.5 ab
Zeus	26 a	14 a	165 b	193 c	171 ab	205 ab	1.0 a	0.8 a	13 ab	11.0 ab	14.8 a	10.8 ab

²Values are the mean of 4 replications; data were analyzed using GLIMMIX and means were separated at the 5% level using the slice option to perform Tukey's multiple comparison test; values followed by different letters within a column are significantly different.

Marketable pumpkin weight was not different for any other cultivar in either year compared to 'Gladiator'. In 2016, 'Challenger' produced higher mean pumpkin weight than 'Eagle City Gold', 'Gold Challenger', 'Gladiator', 'Mrs. Wrinkles', and 'Zeus'. No other differences between cultivars were observed. In 2017, 'Early King' produced higher mean pumpkin weight than 'Gold Challenger', 'Hannibal', 'Gladiator' and 'Zeus'. Additionally, 'Camaro' produced higher mean pumpkin weight than 'Gladiator' and 'Zeus'. No other differences between cultivars were observed.

Mean number of marketable pumpkins from 'Gladiator' plants was not different than any other cultivar in both years. In 2016, 'Honky Tonk' produced more marketable pumpkins than 'Gold Challenger' and 'Cargo'. Additionally, 'Camaro' outperformed 'Cargo' in marketable number of fruit in 2017.

Mean number of unmarketable pumpkins for all cultivars was not different from 'Gladiator' in both years.

Southeastern Site

Mean weight of marketable pumpkins for all cultivars was not different from 'Gladiator' in both years (Table 3). In 2016, 'Challenger' marketable weight was higher than 'Eagle City Gold'. In 2017, 'Kratos' marketable weight was higher than 'Hannibal' and 'Gold Challenger'. All other cultivars were not different from each other.

In 2016, the mean number of marketable pumpkins was not different from any cultivar. In 2017, mean number was not different from 'Gladiator' for any cultivar. In this year, 'Kratos' yielded more pumpkins than 'Gold Challenger'. All other cultivars were not different from each other.

Mean number of unmarketable pumpkins for all cultivars was not different from 'Gladiator' or each other in both years.

Based on yield, all cultivars evaluated were not different than the standard 'Gladiator'. Growers should consider quality including shade of orange, shape, and degree of ribbing when selecting cultivars. Many cultivars can be selected to meet varying consumer preference for these quality factors without sacrificing yield.

(continued on page 23)

Table 2. Unmarketable yield of 21 cultivars of pumpkins grown in three locations in Pennsylvania in 2016-17.

Cultivar	Unmarketable Yield (no.)					
	Southwestern Site		Central Site		Southeastern Site	
	2016	2017	2016	2017	2016	2017
Ares	0.0 ²	1.5	0.0	0.3	0.8	1.8
Bayhorse Gold	0.0	1.5	0.5	0.0	2.0	1.8
Camaro	0.3	2.0	0.0	0.0	3.3	1.8
Cargo	0.0	2.3	0.0	0.0	0.8	2.3
Challenger	0.0	2.25	0.0	0.3	2.5	1.8
Eagle City Gold	0.0	2.5	0.0	0.0	1.3	1.0
Earlipak	0.0	3.3	0.0	0.0	1.0	2.0
Early King	0.3	2.0	0.3	0.3	1.0	1.5
Gold Challenger	0.0	1.3	0.5	0.0	1.8	2.8
Gladiator	0.0	2.5	0.5	0.3	1.0	2.3
Hannibal	0.0	2.3	0.0	0.3	2.8	3.3
Honky Tonk	0.0	3.3	0.0	0.3	0.5	2.3
Kratos	0.3	2.0	0.0	0.0	0.3	3.3
Magic Lantern	0.0	3.8	0.3	0.5	0.8	1.5
Magic Wand	0.0	3.3	0.0	0.0	1.0	3.5
Mrs. Wrinkles	0.3	0.5	1.0	0.5	1.3	2.0
Orange Rave	0.0	1.0	0.3	0.0	2.0	1.3
Rhea	0.3	1.5	0.5	0.3	1.0	2.8
Solid Gold	0.3	1.8	0.3	0.5	1.3	1.8
Spartan	0.0	1.0	0.0	0.3	0.8	2.8
Zeus	0.0	3.8	0.3	0.8	1.5	2.0

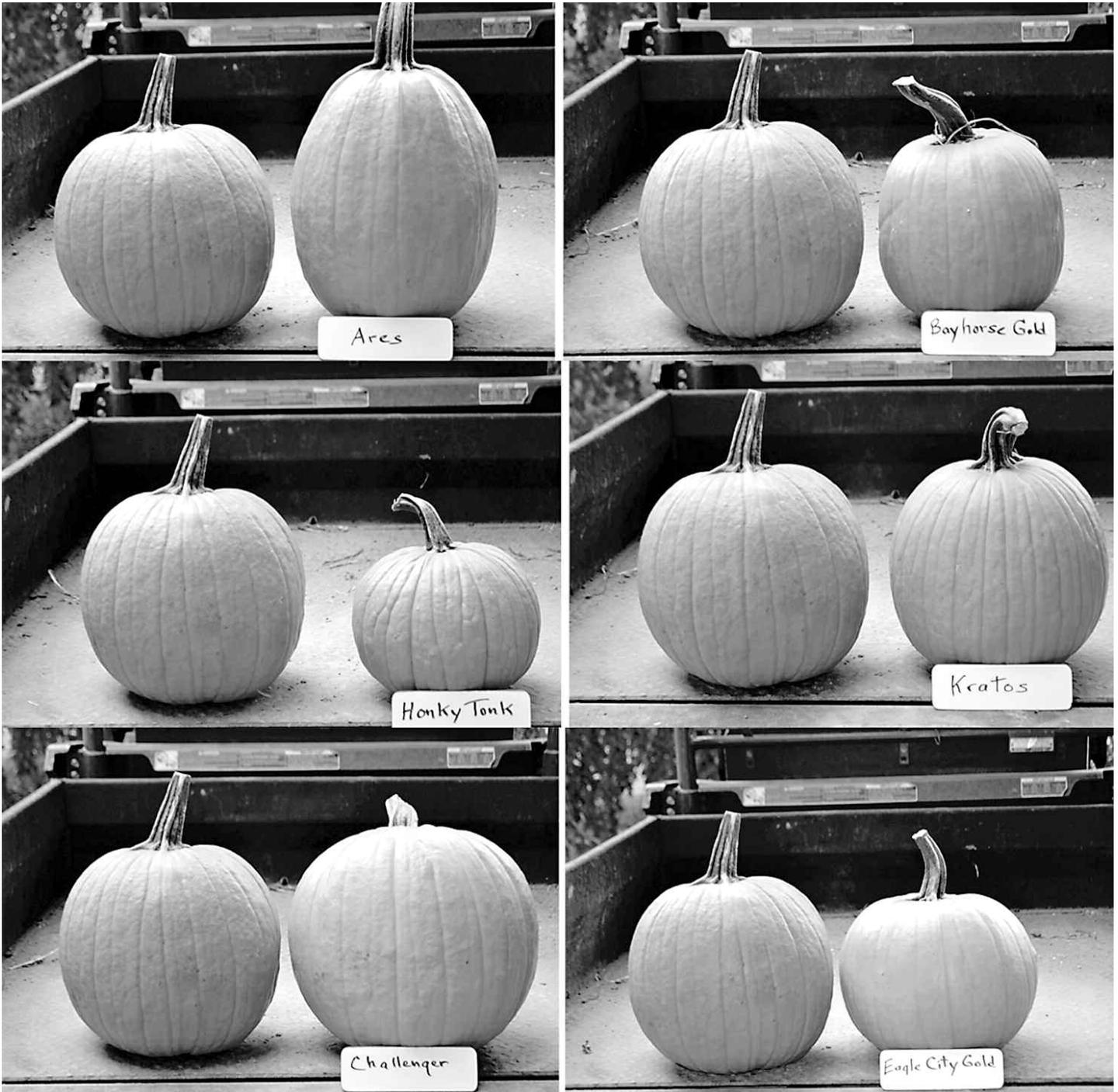
²Values are the mean of 4 replications; data were analyzed using GLIMMIX and means were separated at the 5% level using the slice option to perform Tukey's multiple comparison test; values followed by different letters within a column are significantly different.



VEGETABLE PRODUCTION

Statewide Pumpkin... (continued from page 22)

Pictures of each cultivar next to 'Gladiator' ('Gladiator' is on the left in each picture; Photos: Tom Butzler, Penn State) taken in 2017 at the central site. The photo of 'Magic Lantern' was taken in 2017 at the southeastern site (Photo: Tim Elkner, Penn State).



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VEGETABLE PRODUCTION

Statewide Pumpkin... (continued from page 23)



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Spring Planted Cover Crops for Vegetable Rotations

Gordon Johnson

One principle of managing for improved soil health is that you should always have a crop growing on the soil. This will maintain or add organic matter, provide benefits from the action of growing roots, and recycle nutrients.

Where fall cover crops were not planted due to late harvest, spring cover crops can be planted and provide soil health benefits where vegetables are not scheduled until late May or the month of June.

The most common grass family cover crop options for mid to late March or early April planting are spring oats, and annual ryegrass. Plant oats 90-120 lbs per acre and annual ryegrass at 20-30 lbs per acre.

Mustard family (Brassica) cover crop options for late March or early April planting include yellow mustards, white mustards, brown mustards and oriental mustards. Companies also offer blends of several mustard species. Mustards are generally planted at 10-20 lbs per acre. Rapeseed and canola are another mustard family option for spring planting at 5-12 lbs per acre. Forage radishes and oilseed radishes can also be spring planted at a rate of 4-10 lbs per acre. Arugula is an additional mustard family option planted at 4-7 lbs per acre.

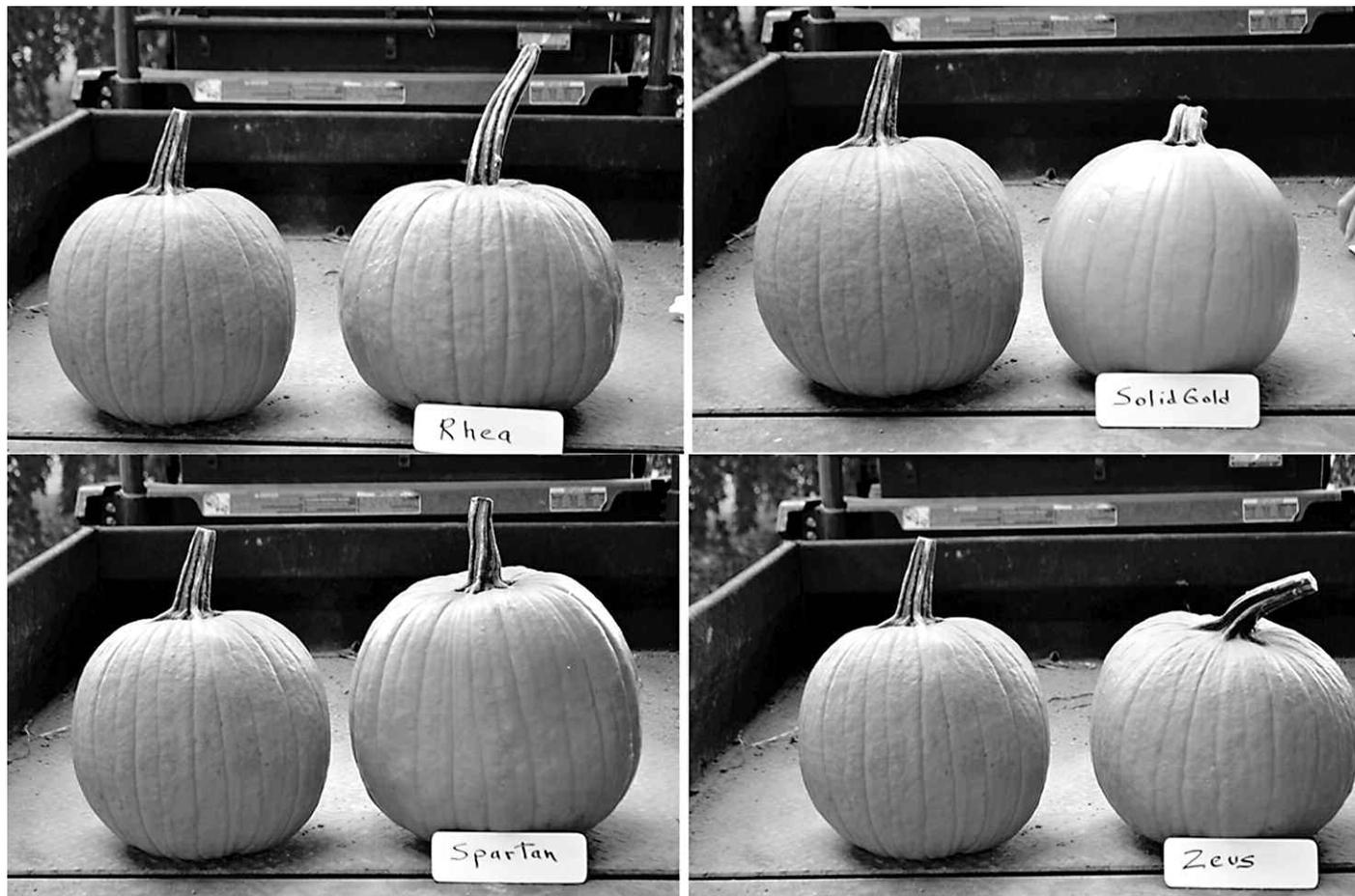
In the legume family, field peas are another option for spring planting. One type of field pea is the winter pea which is often fall planted in our area but can be spring planted. It has smaller seed so the seeding rate is 30-60 lbs per acre. Canadian field peas are larger seeded and used as a spring cover crop planted alone at 120-140 lbs per acre. An often-forgotten spring seeded legume crop that can also be used is red clover. Red clover can be frost seeded into small grains, seeded alone, or mixed with spring oats or annual ryegrass. Seeding rates for pure stands would be 10-16 lbs per acre, for mixtures 6-10 lbs per acre.

Mixtures also can be used. Research has shown that you get the best soil health benefits from mixing three species from different plant families. Commonly a grass is mixed with a legume and with a mustard family crop. Examples would be spring oats, field peas, and forage radish; or annual ryegrass, red clover, and mustard. Reduce seeding rates of each component when using in mixtures. Companies often offer preblended mixture for these uses.

Many of the mustards have biofumigation potential. When allowed to grow to early flower stage and then incorporated into

(continued on page 26)

Statewide Pumpkin... *(continued from page 24)*



Dr. Sanchez and Dr. Lamont (emeritus) are with the Department of Plant Science at Penn State Univ. while Dr. Elkner, Mr. Butzler and Mr. Pollock are with Penn State Extension. These cultivar trials were funded by PVGA and the Pennsylvania Vegetable Marketing and Research Program. Pictures from <https://extension.psu.edu/pumpkin-cultivar-trial-results>.

VEGETABLE PRODUCTION

Seedless Watermelon Trials 2017

Gordon Johnson

Each year the University of Delaware conducts seedless watermelon variety trials which helps to inform the industry on the performance of current and newly developed varieties under Delmarva growing conditions and helps growers choose the best varieties to match growing and marketing needs.

Growers should select varieties based on market needs, marketability, and productivity. This includes yield, maturity, longevity, size distribution, appearance (rind color, shape), flesh quality (color, sugars), flesh density, limited defects such as hollow heart susceptibility, plant vigor, and disease resistance (Fusarium, anthracnose), and field holding ability. Pollenizers should be matched to the seedless variety to provide early and extended pollen production, disease resistance, and appropriate vigor (too vigorous will compete with the seedless).

The 2017 Seedless Watermelon Variety Trial included 33 varieties from 9 participating companies. The purpose of this trial was to evaluate seedless watermelon varieties for yield, quality and maturity. The trial was conducted at the Thurman Adams Research Farm, University of Delaware, Carvel Research Center.

Plants were transplanted to the field on May 17, 2017. Due to the late spring, plots were not harvested until August. Fruit were harvested three times. The first harvest was on August 2 and 3 at 77 days after transplanting (DAT), the second harvest was 95 DAT, and the final harvest was in early September at 115 DAT. The weight of each watermelon harvested was recorded individually. Five marketable watermelons from each plot were cut and evaluated for presence of hollow heart and soluble solids levels.

Spring Planted... (continued from page 25)

Finely chopped biofumigant cover crop ready for incorporation. Chopping releases the biofumigant compounds in the plants.

the soil, they release compounds that act as natural fumigants, reducing soil borne disease organisms. Some biofumigant mustard varieties include Pacific Gold, Idagold, and Kodiak. Biofumigant blends include Caliente and Mighty Mustard. Biofumigant rapeseed varieties include Dwarf Essex and Bonar.

To use as a biofumigant, mustards will be allowed to go to full growth (early flowering) and then are chopped with a flail chopper (cut fine) and incorporated with a tractor mounted rototiller or other tillage tool for complete incorporation. Chopping releases the biofumigant compounds in the plants. Ideally the area then should be rolled with a cultipacker or over-head irrigated to seal in the biofumugant.

When used as a biofumigant, mustards should be grown as a crop. You need to add 60-100 lbs of nitrogen per acre to pro-

The highest yielding varieties in the trial in terms of marketable pounds per acre were: Crunchy Red, 9651, Turnpike, 9601, Bottle Rocket, Warrior, SV 0241 WA, Fascination, Red Amber, ORS 6278, Kingman and XWT 6009. This high yielding group ranged from 135,220 to 99,230 lbs per acre.

The highest yielding varieties in the trial in terms of fruit per acres were: Crunchy Red, Turnpike, SV 0241 WA, Warrior, Kingman, ORS 6151, and 9601 ranging from 7,836 to 6396 melons per acre.

All varieties produced more than 40% of their yield on the first harvest. The following varieties produced more than 60% of their yield on the first harvest: ORS 6253, SV 3105 WA, ORS 6278, Red Amber, WDL 2413, ORS 6260, Charismatic, ORS 6305, Road Trip Captivation, XWT 6008, ORS 6151, Fascination, Bottle Rocket, Summer Breeze, and 7197. Those varieties with extended harvest (50% or more harvested in the second and third harvest) were Secretariat, Turnpike, and 9601.

Varieties were also sorted according to average fruit in each of four weight classes: 60-count (9.0-13.5 lbs), 45 count (13.6-17.5 lbs), 36 count (17.6-21.4 lbs) and 30 count (>21.5 lbs). In general, fruit weights were above average in 2017. Large fruited varieties with average weights over 18 pounds were Bottle Rocket, Maxima, SV 3105 WA, ORS 6278, ORS 6305, Joy Ride, and Road Trip. Medium fruited varieties over 16 pounds included Red Amber, Captivation, Summer Breeze, WDL 2413, Crunchy Red, 7187, ORS 6260, 9601, XWT 6009, 7197, Fascination, Wolverine, Unbridled, Turnpike, Warrior, XWT 6008, SV 0241 WA, and Charismatic.

(continued on page 27)



Spring planted cover crops shown including mustards, rapeseed, radishes, and arugula.

duce the maximum biomass. Nitrogen is also required to produce spring oats and annual ryegrass at similar rates. When planting mixtures with peas, nitrogen rates should be reduced.

Several spring-planted cover crops have been used specifically to address nematode infested soils. This includes "Nemat" arugula and "Image" radish. Mustards such as Caliente 199 have been used to reduce Phytophthora infestations.

Dr. Johnson is the Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware Coop. Extension, Issue 26:1, March 2, 2018.

VEGETABLE PRODUCTION

Seedless Watermelon... (continued from page 26)

Those varieties with more than 35% of the melons harvested in the 45-count class included XWT 6008, ORS 6260, Kingman, 7197, ORS 6253, Charismatic, SV 0241 WA, and Secretariat.

Varieties with high percentage of small fruited melons (60-count) included ORS 7033 B, Secretariat, ORS 6151, 9651 and Kingman.

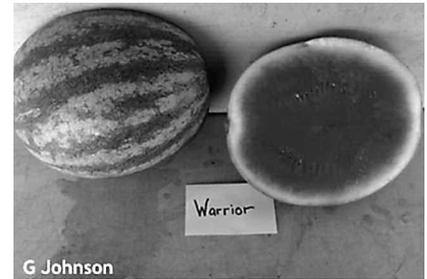
Varieties with high numbers of 36-count fruit were Captivation, 9601, Road Trip, Unbridled, Charismatic, and Wolverine. Bottle Rocket, SV 3105 WA, ORS 6305, ORS 6278, and Maxima produced over 30% in the 30-count class (very large melons).

Two small fruited "mini" melons, Mini Bee and ORS 7033 B were also tested. They had the highest number of fruits at 8,931 and 9,968 melons per acre respectively. Mini Bee produced over 80% of its melons in the personal or icebox size class from 4 to 9 pounds. ORS 7033 B produced 41% of its melons in the small size class.

There were significant differences in soluble solids among the varieties which is a measure of sweetness. Road Trip, 9651, Turnpike, Unbridled, ORS 6260, Kingman, 7197, Embassy and Captivation had the highest soluble solids levels. All of the varieties had average soluble solids of over 10% with the exception of XWT 6009 and ORS 9033 B.

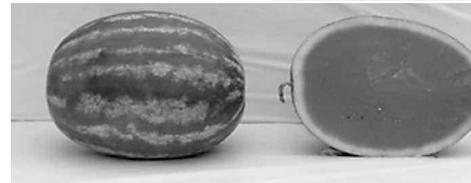
Hollow heart defects can render watermelons unsaleable. No hollow heart was observed in Mini Bee, Joy Ride, ORS 6260, ORS 6278, ORS 6305, ORS 6253 and Summer Breeze. Turnpike had high levels of hollow heart. Those additional varieties with one or more fruit with major or severe hollow heart (10% unsaleable) were SV 0241, and 9601.

Trials will also be conducted in 2018 and growers are invited to visit the trial during the season. Results from this year's trial can be found on-line at: <http://extension.udel.edu/ag/vegetable-fruit-resources/vegetable-small-fruits-program/>



Warrior, a lighter rind type with good interior color

G Johnson



Fascination, current industry standard

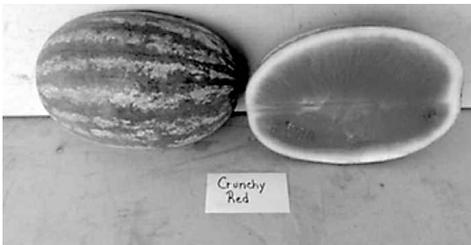
E Ernest



Red Amber, a new entry into the watermelon market

G Johnson

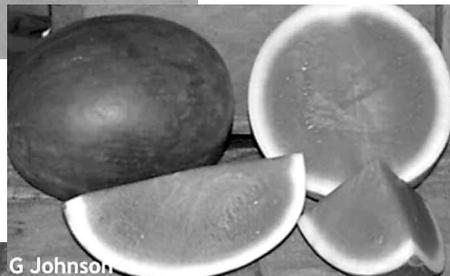
Dr. Johnson is the Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware Coop. Extension, Issue 26:1, March 2, 2018.



Crunchy Red, an older variety that did very well in 2017

G Johnson

9651 a high yielding dark rind type



G Johnson

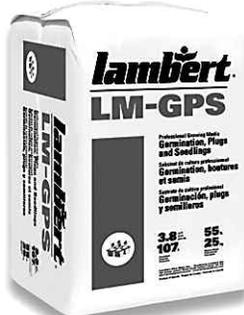


Turnpike did well in 2017

G Johnson

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VEGETABLE PRODUCTION

Growing Spring Broccoli in Delaware

Gordon Johnson

There is a demand for local, spring-harvested broccoli in our region. However, growing spring broccoli to commercial standards is a challenge due to heat effects during head formation which causes defects such as brown bead, uneven heads (knuckled), loose heads, and premature flowering. This renders heads unmarketable. Spring plantings also have shown limited head holding ability as temperatures reach into the 90s.

Temperature variability is the main challenge for spring broccoli. Broccoli is a cool season plant and is best adapted to areas with consistent temperatures during head development where days are warm, not hot, and nights are cool. On Delmarva, high temperatures during head initiation in the spring leads to abnormal floret development. Temperatures more than 88°F can cause damage to florets in sensitive varieties.

More heat tolerant varieties have been developed and were tested in 2017 spring trials. There were 22 varieties tested in two 2017 spring trials. Plants were transplanted to the field on April 3 for planting 1 and April 17 for planting 2. Plots were harvested from the May 31 to June 19 in planting 1 and



Uneven floret development and brown bead in a variety with most heads unmarketable.

June 8 to June 26 in planting 2. Plots were harvested as crown cuts. Target head size was 4+ inches in diameter and heads were cut 1 inch below the lowest floret attachment. Data collected included marketable and cull head number and weight, crown diameter, crown height, head uniformity ratings, head evenness ratings, hollow stem incidence, and brown bead ratings. Descriptive characteristics included color and dome shape.

In the April 3 planting, Eastern Crown had the highest marketable yield with 467 boxes per acre and 9 % cull. Luna also yielded over 400 boxes per acre (452). Yields of other varieties tested were below 400 boxes per acre in trial 1. In the April 17 planting, Millenium significantly out yielded all varieties with 641 boxes per acre and 0 percent culls. Other varieties yielding over 400 boxes per acre were Eastern Crown, and Emerald Crown (488 and 423 respectively). Gypsy and Iron Man had the most uniform marketable heads. Destiny, Eastern Crown, and Green Gold had the highest ratings for brown bead. Diplomat, Gypsy, and Imperial had significant hollow stem. Iron Man, Gypsy, Everest, Emerald Jewel, Emerald Crown, and Diplomat had the highest ratings for head evenness.

For a full report on the 2017 trial go to <http://extension.udel.edu/ag/vegetable-fruit-resources/vegetable-small-fruits-program/variety-trial-results/>

Broccoli trials are being repeated in 2018 with later planting dates to better assess varieties under heat stress.

(continued on page 29)

Should Growers Befriend Wasps?

Thomas Butzler

Small fruit and vegetable growers understand the role that honeybees, bumblebees, and solitary bees play in pollination of crops.

Paper wasps typically build their nest in high protected structures such as house or barn eaves.



The rare sting (more from the social bees than solitary) is a trade-off we are all willing to take. Should growers be as accommodating with paper wasps?

There are some similarities between these social insects; paper wasps, honeybees, and bumblebees. All have a queen whose main role is to lay eggs while the workers (also female), build the majority of the nest and collect food.

One major difference these three social insects have is diet. The honeybee and bumblebee obtain their protein source from pollen. Their hairy bodies are built to collect pollen as they move from flower to flower. Look closely at a paper wasp and notice the minimal amount of hair on the body parts. The conclusion could be made that they are not big pollen collectors.

The protein sources for paper wasps are caterpillars. The literature states that some colonies (50-100 wasps) can feast upon 2000 caterpillars. North Carolina states that tests have

shown that enhancing paper wasp populations in tobacco fields reduced caterpillar populations in the crop. All farmers are encouraged to practice IPM, part of which encourages the use of biological control. Why shouldn't growers encourage these voracious predators onto their property?

The best way to have a healthy population of paper wasps in the field is to understand their housing situation. Honeybees and bumblebees like to build their nest in protected areas; tree cavities and ground burrows respectively. Wasps will build their nests in the open, underneath a protected area. Most commonly, these can often be seen under house/barn eaves. The higher the nest location, the more attractive it seems for the wasps.

Unless a paper wasp nest is close to human activity such as under a porch eave and directly above a screen door, let them be. They really only become aggressive when activity takes place within a foot or two of their nest.

To take advantage of these beneficial insects, consider building a wasp nest box. North Carolina State University has some simple directions and suggestions to building structures for around the farm at <https://www.ces.ncsu.edu/depts/ent/notes/Other/note121/note121.html>. Because these will not be as high as a nest in barn/house eaves, locate it away from an area of heavy human activity.

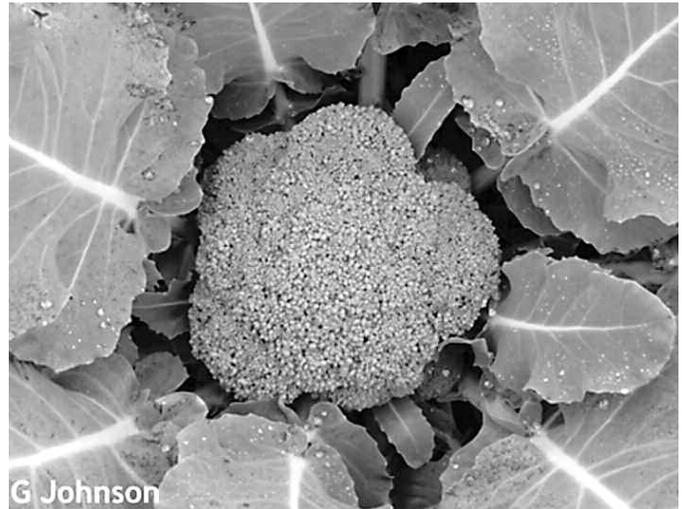
*Mr. Butzler is with Penn State Extension in Clinton Co. From **Vegetable, Small Fruit and Mushroom Production News**, Penn State Extension, <http://extension.psu.edu/plants/vegetable-fruit/news>, March 3.*

VEGETABLE PRODUCTION

Growing Spring Broccoli... (continued from page 28)

Broccoli marketable yields and cull percent, UD-REC, Georgetown, Spring 2017, April 17 planting (heat stressed).

Variety	Marketable Yield		Cull
	lbs/acre	Boxes/acre	%
Millennium	14735	641	0
Eastern Crown	11214	488	3
Emerald Crown	9732	423	9
Experimental Variety	9342	406	16
Gypsy	9033	393	7
Green Gold	8433	367	6
Experimental Variety	8324	362	10
Luna	8255	359	10
Green Magic	7745	337	10
Durapak 16	7574	329	9
Everest	6812	296	24
Emerald Star	6726	292	0
Imperial	6681	290	3
Lieutenant	6595	287	19
Diplomat	5530	240	6
Burney	5043	219	17
Experimental Variety	3778	164	41
Iron Man	3526	153	3
Destiny	3509	153	45
Emerald Jewel	2988	130	6
p 0.05	0.001		
LSD	2219		



Eastern Crown



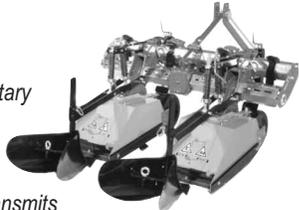
Millennium

Dr. Johnson is the Extension Vegetable and Fruit Specialist at the Univ. of Delaware. From the **Weekly Crop Update**, Univ. of Delaware Coop. Extension, Issue 26:1, March 2, 2018.



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GREENHOUSE PRODUCTION

Managing Diseases in Greenhouse Grown Melon Transplants

Kate Everts

Examine greenhouse transplants daily. Below are pictures of common diseases that show up on transplants and some advice on how to manage each disease. Additional information is available in the links.

Bacterial Fruit Blotch



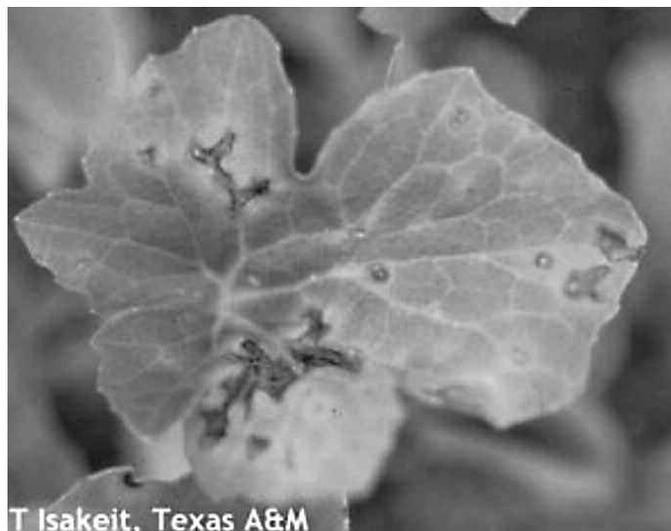
T Isakeit, Texas A&M

The first symptoms of bacterial fruit blotch in the greenhouse is water-soaking on the underside of cotyledons.



J Brock, University of Georgia

5487785



T Isakeit, Texas A&M

Bacterial fruit blotch in watermelon transplants. Note the yellow halos around the necrotic lesions.

If a bacterial pathogen is present, conditions in greenhouse transplant houses are highly favorable for the development of disease.

Separate different seedlots, in order to reduce lot-to-lot spread if disease occurs.

The two most prevalent bacterial diseases on watermelon or cantaloupe are bacterial fruit blotch (BFB) or angular leaf spot.

Both can cause significant yield loss in the field. BFB has caused extremely high losses in the recent past.

If either bacterial disease is suspected, collect a sample and submit it to your extension educator, specialist, or UD or UMD plant diagnostician.

If BFB is confirmed, destroy all trays with symptomatic plants, and the trays that were immediately adjacent to them (this should include those that were adjoining when symptoms were first observed).

Some fungal diseases also can show up in transplant production: gummy stem blight, Alternaria leaf blight, anthracnose, and Fusarium wilt.

Angular Leaf Spot



ML Ross, UMD

Angular leaf spot on cantaloupe looks similar to bacterial fruit blotch.

(continued on page 31)

GREENHOUSE PRODUCTION

CLASSIFIEDS

Managing Diseases... (continued from page 30)



D Egel, Purdue U.

Upper and lower surface of leaf with symptoms of angular leaf spot.

Links to more information:

Managing bacterial fruit blotch in the greenhouse <http://extension.udel.edu/weeklucropupdate/?p=5318>

Managing bacterial fruit blotch in the field <http://extension.udel.edu/weeklucropupdate/?p=2965>

Comprehensive article including disease cycle, epidemiology and management <http://www.apsnet.org/edcenter/intropp/lessons/prokaryotes/Pages/BacterialBlotch.aspx>

*Dr. Everts is the Vegetable Pathologist with the Univ. of Delaware and the Univ. of Maryland. From the **Weekly Crop Update**, Univ. of Delaware, Vol. 25, Issue 5, April 28, 2017.*

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Even though the initial deadline was February 6, the USDA National Agricultural Statistics Service (NASS) asks farmers who have not completed the Census of Agriculture to do so. Please respond to www.agcounts.usda.gov or call King Whetstone at 717-787-3904 with questions.

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