PENNSYLVANIA
VEGETABLE GROWERS

NEWS

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for the commercial vegetable, potato and berry grower

PVGA Membership Increases to 993

For 2015, PVGA membership reached its second highest level in recent history at 993 members, up from 976 in 2014. In 2011 PVGA reached its long-held goal of having 1,000 members. Membership reached 1,004 to be precise. In 2012, membership dropped to 986 and in 2013 it dropped again to 961. While the increases in 2014 and 2015 are steps in the right direction, the Census of Agriculture indicates there are over 3,300 farms in Pennsylvania that grow an acre or more of vegetables. Thus, PVGA has a large potential membership as yet untapped.

The Directors have set a goal of retaining 90% of the previous year's members and recruiting 15% new members each year. Unfortunately for 2015 only 86% of last year's members rejoined although the goal of 15% new members was met. Membership has increased over the previous year in five of the last ten years, increasing 4% in that time period from 959 in 2006.

PVGA is completing its 89th year as an association. The Directors are fully aware that membership goals can only be met and maintained by providing an adequate return to members for their dues investment.

As a result of the Vegetable Industry Strategic Planning Initiative which the Association and the Pennsylvania Vegetable Marketing and Research Program (PVMRP) undertook in early 2014, the Association and PVMRP applied for and received a Specialty Crop Block Grant from the Department of Agriculture. The grant will allow PVGA and PVMRP to use $30,000 to further develop both groups' abilities to better serve the growers of Pennsylvania.

Meanwhile, however, the Association strove continue to provide a good return on members' dues investment in 2015 with the following ongoing activities and member services:

- PVGA helped sponsor the 2015 Mid-Atlantic Fruit and Vegetable Convention – the premier grower meeting of its kind on the east coast.
- PVGA published the *Pennsylvania Vegetable Growers News,* its own 24-plus-page monthly newsletter with pertinent information for the Pennsylvania vegetable, potato, berry or greenhouse vegetable grower.
- PVGA provided $77,000 for vegetable and small fruit research in 2015 - bringing the Association's total for research contributions to $860,264 over the last 27 years.
- PVGA represents the interests of the vegetable, potato and small fruit industries on legislative and regulatory issues through letters and meetings with public officials.
- PVGA cooperated with the Department of Agriculture and the Vegetable Marketing and Research Program to represent the Pennsylvania vegetable industry at various promotion events.
- PVGA co-sponsored several regional twilight meetings or field days this summer and fall as grower educational opportunities plus a bus tour of Virginia and West Virginia farm markets.
- PVGA holds the trademark for the Pennsylvania Simply Sweet Onion to help develop a new profitable, branded crop for Pennsylvania growers.
- PVGA is especially proud of the volunteer effort put forth each year by PVGA members to run the Association's Food Booths at the Farm Show and Ag Progress Days. These efforts have enabled PVGA to donate over three-quarters of a million dollars towards research and promotion activities over the last 27 years. The Board of Directors has essentially devoted the profits from the Food Booths to fund the Association's research, promotion and donation budgets rather than any of the Association's general operations.

In 2015 PVGA members again received free subscriptions to the *American Vegetable Grower* magazine and the *Vegetable Growers News.*

Dues invoices for 2016 will be mailed in late November. We hope all members will renew your memberships for 2016 and that you will urge a neighboring grower to join as well. We want to see PVGA membership continue to increase. Increased membership allows the Association to better the serve the vegetable, potato and berry growers of Pennsylvania – and that is our end purpose.

2016 Mid-Atlantic Convention Opens February 2

Elaine Froese, 2016 Keynote Speaker

The 2016 Mid-Atlantic Fruit and Vegetable Convention will be held February 2 to 4, 2016, at the Hershey Lodge and Convention Center in Hershey, Pennsylvania. Over 2,100 fruit, vegetable, and berry growers and other industry persons from throughout the mid-Atlantic region and beyond are expected to attend. This year's convention will again feature several pre-convention workshops, a farm market bus tour, and a trade show with over 160 exhibitors plus three full days of seven or more concurrent educational sessions. This year's keynote speaker will be Elaine Froese, a professional speaker, writer and farm family coach who specializes in succession planning.

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"See Part 4 of the How a Recall Unfolds on page 3"

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2016 Mid-Atlantic Convention... *(continued from page 1)*

Elaine Froese is a professional speaker, writer and farm family coach who specializes in succession planning. Her expertise is sought after across Canada and in the U.S. She helps family businesses talk about the tough issues and act on them. She's a catalyst for courageous conversations, new scenarios and more profitable businesses. Many of her clients say "I wish I had met you 10 years ago." Besides the keynote presentation on February 2, she will be speaking the following day in the Business Planning session.

The day before the main Convention opens, growers can chose between a bus tour of Pennsylvania farm markets or five different workshops. The workshops include Hard Cider, Farm Transitions, Hops Production, Tree Fruit Pruning, Consumer Messaging, Food Safety Training, and Pennsylvania Pesticide Applicator License Training.

The Mid-Atlantic Convention has been jointly sponsored by the State Horticultural Association of Pennsylvania, the Pennsylvania Vegetable Growers Association, the Maryland State Horticultural Society and the New Jersey State Horticultural Society for the past 38 years. In 2014, the Virginia State Horticultural Society also began meeting at the Convention as well. The Pennsylvania State University, University of Maryland, Rutgers University Cooperative Extension and Virginia Tech University plus the National Peach Council all assist in organizing the three days of educational sessions.

The Convention has become one of the premier grower meetings in the Northeast. The Great American Hall and the Aztec Room at the Hershey Lodge and Convention Center will host the Trade Show. Specialized horticultural equipment, farm market merchandise, and packaging will all be on display along with information on the latest seed varieties, fruit varieties, pesticides and other supplies and services for the commercial grower.

Many pesticide applicator update training credits will be available to Pennsylvania, Maryland, New Jersey and Virginia growers attending the sessions. The program covers nearly every aspect of fruit, vegetable, potato and berry production. Commercial growers should not pass up this terrific educational opportunity.

Seven or eight concurrent educational sessions will be offered on all three days of the Convention. Besides a combined session for the keynote address, the opening day will feature breakout sessions on Tree Fruit, Sweet Corn, Organic Vegetables, Wildlife Management, GMOs, Food Banks, Herbs, Hops, Cover Crops, Food Safety Crisis Management, Root Crops, Hydroponics, Wholesale Marketing and Labor/Farm Management.

On the second day, sessions on Business Planning for Direct Marketers, Agritainment, Small Fruit, Tree Fruit, Peaches, Tomatoes, Greenhouse Ornamentals, Wine Grapes, Peppers and Eggplant, Specialty Vegetables and General Vegetables will be offered. Also offered will be the session "Técnicas de Producción de Frutas y Hortalizas" especially for Spanish speaking workers in the fruit and vegetable industries. It will feature various relevant production presentations in Spanish.

The Convention will close on the third day with sessions on: Peaches, Tree Fruit, Vine Crops, Pumpkins, Marketing 101, Social Media, High Tunnels, Small Fruit, Blueberries, Potatoes, Cut Flowers, New Equipment and Biocontrols.

The tenth annual Mid-Atlantic Cider Contest will be conducted during the Convention to determine the best tasting cider produced in the region. On February 2, fruit and vegetable growers will gather for the annual Fruit and Vegetable Growers Banquet which will include awards and recognitions. On February 3 there will be an Ice Cream Social in the evening.

Registration is required for all persons attending the Convention trade show or educational sessions. Registration with any of the five sponsoring organizations allows one to attend any of the sessions although there are additional charges for some workshops and meals. For further information, go to www.mafvc.org or call 717-694-3596.

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

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

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

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

NEWS

To Recall or Not to Recall, and Other Important Decisions

Amy Philpott

How a Recall Unfolds, Part 4: Making the Decision

This is the fourth of a special, six-part series called "How a Recall Unfolds," which explains the recall process and offers practical tips on how to prepare for and survive a product recall. It is part of a Specialty Crop Block Grant project designed to help Pennsylvania vegetable growers be prepared to deal with a recall situation.

Many farmers assume that the most important decision in a potential food recall situation is whether to recall. However, this is only one of many important decisions that must be made, and, arguably, it isn't the most important one.

After learning of a potential problem, the first decision a farmer must make is what, if any, immediate administrative actions should be taken while the facts are being gathered. These actions may include halting harvest or temporarily closing the packing facility.

This first decision is one of the most important because it can set the tone for the FDA investigation, impact public health, and affect the farm's brand and image. For example, if the farmer decides to not stop production after being told one of its products was found to be contaminated, he must explain to FDA why not. There may be very good reasons for making such a decision, but it will need to be justified.

In addition, news reporters, customers and consumers will want to know what the farm did when it first learned there was a possible problem with its product. So the farm may also need to explain to these groups why it did not halt activities in the face of a potential threat to public health.

Finally, if it is determined later that the farm should have halted production and it did not, this not only increases the potential risk to public health, but the farm may have to recall much more product than it otherwise would have.

The next decision is equally important: Does the situation require input from an area of expertise not included in the recall team, and if so, who should be called? The first few hours of a potential recall are the most critical, and it matters who a farmer chooses to have by his/her side. Ideally, these key resources, such as communication consultants, legal counsel, technical experts and academics have already been identified in the recall plan, and it is simply a matter of determining who to contact given a particular situation. These consultants and advisors provide insight, advice, recommendations and options that help the farmer make decisions.

After the farmer and his/her advisors gather and assess the available, relevant information (discussed in parts 2 and 3 of this series), two more critical decisions must be made: 1) whether to recall and 2) if so, what and how much to recall. Most of the time, the decision whether to recall or not becomes evident during the information gathering and assessment stages. However, accurately identifying the scope can be more challenging.

In part 2 of this series, we discussed the importance of record keeping and "defensible separations" when identifying the scope of a potential recall. In most cases, the decisions about which products and how much (volume) of them to recall comes down to recordkeeping. For example, receiving, production, inventory, cleaning and sanitation, chemical logs, and shipping records can be used to justify why some products are included in the recall and why others are not. A single error or omission in any of these records puts the integrity of all of the records into question, and the farm may decide to expand the scope of the recall as a precautionary measure because it (or FDA) isn't confident in the accuracy of the records. In cases where records are missing or unreliable, the entire season's production may need to be recalled.

At the same time the farmer is deciding the recall scope, there are many other strategic and tactical decisions that must be made in preparation of executing the recall. For example, decisions must be made regarding when to contact customers; who will contact them and how; what to instruct them to do with the recalled product; who will meet FDA investigators when they arrive; how will the farm handle consumer inquiries; who will be the farm's media spokesperson; and whether a social media strategy is needed.

Most of these decisions can be thought-out ahead of time, and all of them should be included in the farm's recall plan (Part 1 of this series). Of course, every situation is different so the plan may need to be adjusted based on actual circumstances, but planning ahead makes decision-making easier and faster.

While all decisions during a recall situation are important, the ones made early on can have the biggest impact because they affect subsequent decisions and actions.

For these reasons, putting thought into them in advance is well worth while.

Coming Next Month: On your mark. Get set. GO! How a Recall Unfolds, Part 5: Executing the Recall. *Amy Philpott specializes in reputation management and risk communications in the food and agricultural sectors. She works at Watson Green LLC, a public communications firm in Washington, DC, and is an instructor in the United Fresh Recall Ready Program (www.unitedfresh.org/recallready). Amy can be contacted at aphilpott@watsongreenllc.com.*

Be a Keystone Member for 2016 and Invest in PVGA's Future

In 1994, the Association established a new membership class, the Keystone membership, and an endowment-type fund, the Keystone Fund. PVGA members who wish to support the vegetable, potato and berry industries in a special way pay dues above the regular rate, with the dues above the regular rate being placed in the Keystone Fund. The current balance in the Keystone Fund is about $119,00 which is invested in money market accounts, two bond mutual funds and an index stock mutual fund.

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

- An annual $1,000 student scholarship that will be awarded according to criteria set by a special committee. The committee has awarded a total of six scholarships to date.
- Half of any remaining interest will be given to the Penn State Plant Pathology Department as a general research grant in support of the vegetable pathologist's ongoing research work.
- The other half of any remaining interest will be given to the Penn State Entomology Department as a general research

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

grant in support of the vegetable entomologist's ongoing research work.

The special research grants from the Keystone Fund were designated for the Plant Pathology and Entomology Departments at this point in time rather than the Horticulture Department because the Association for five years was giving $10,000 annually to partially support a vegetable research technician in the Horticulture Department. This support comes from the Association's General Fund. As interest rates have declined over the past several years, these research grants have grown smaller unfortunately.

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

Keystone membership is open to all vegetable, potato and berry farm operations, processing firms and allied industry firms. Associate Keystone Members are additional family members or employees of Keystone Members. The following farms, firms and persons are Keystone or Associate Keystone Members for 2015:

Amsterdam Produce Enterprises (Robert Amsterdam) - *Mechanicsburg*
Hurricane Hill Farm (Edwin C Baldwin III) - *Coatesville*
Baronner Farms (Robert Baronner) - *Hollidaysburg*
Lady Moon Farms (Thomas Beddard) - Chambersburg
Triple B Farms (R.J. and Willam Beinlich) - *Monongahela*
Bendal's Berry Patch (Larry Bendal) - *Tionesta*
Benshoff Farms of New Germany (James Benshoff) - *Summerhill*
Ernest Bergman - *State College*
Indian Orchards (Nancy Bernhardt) - *Media*
Bitler Farms (Timothy Bitler) - *Birdsboro*
William Bitler - *Bloomsburg*
Jospeh Bozzelli - *Worthington*
Kitchen Table Consultants (Jennifer Brodsky & Ted Lebow) - *Collegeville*
Brown's Orchard and Farm Market (Stanley Brown) - *Loganville*
Village Acres (Roy & Debra Brubaker) - *Village Acres*
Clark Crest Farms (Ronald Clark) - *Quarryville*
Valley Fruits & Veggies (Chris Colitas) - *Bethlehem*
Brickyard Hydroponics LLC (Chris L Davis) - *Huntingdon*
Dudas Farm (Roberta Dudas) - *Fairview*
Dymond's Farm Market (Christopher, Fred III, and Timothy Dymond) - *Dallas*
Fred W. Eckel's Sons (Keith Eckel) - *Clarks Summit*
Michael K. Esh - *Kirkwood*
Godfrey Run Farm (Gary Faulkner) - *Lake City*
Windy Hill Farm (Marian Fifer) - *Bulger*
Douds Floyd Farm (Philip Doud Floyd) - *Aliquippa*
Pete's Produce Farm (J. Peter Flynn) - *West Chester*
John Fisher - *Honey Brook*
Furmano Foods (Donald Bergey, Don Geise, Scott Hoffman, James Kohl, Kenneth Martin) - *Northumberland*
Graceland Farm Market (Jonathan Grace) - *Grove City*
Graver's Orchards (Richard Graver) - *Lehighton, PA*
Harnish Farms (Bryan Harnish) - *Pequea*
Anton Hatfield-Nicholson - *Mifflintown*
Ag Choice Farm Credit (Gary Heckman) - *Mechanicsburg*
B & R Farms (Barron Hetherington) - *Ringtown*
Hopkin's Farm (E. Harry Hopkins) - *Falls*
Indian Oven Farms (Edward C. Hopkins, Mark Hopkins) - *Falls*
Central Valley Farm (Edward Huff) - *Asbury*
Haupt Produce (Wilford J Haupt) - *Paxinos*
Cedar Run Produce (John M Hurst) - *East Earl*
Harvest Valley Farms (Arthur, David and Larry King, Caleb Costanzo) - *Valencia*
Peaceful Acres Farms (Clair King) - *Cochranville*
Gerald R. King - *Cochranville*
Kreiders Market (J. Lloyd Krieder) - *Kirkwood*
Lambert Mtn Acres Inc (Gary Lambert) - *Cairnbrook*
Lippy Brothers Farms - *Hampstead*
Foxleigh Farm (Carville Mace) - *Littlestown*
Artic Refrigeration (Michael Mager) - *Batavia*
Harvest View Farm and Market (Kenneth Metrick) - *Butler*
Miller Plant Farm (David Miller) - *York*
Mock's Greenhouse (Paul Mock Sr) - *Berkeley Springs*
General Store Farm Market (David Moyer) - *Birdsboro*
David Newswanger - *Denver*
Daniel's Farm Store (Justus Nolt) - *Leola*
Institute for Plant Based Nutrition (James & Dorothy Oswald) - *Bala Cynwyd*
Triple Springs Farm (Joseph Panzitta) - *Wilkes Barre*
Peters Produce (Dennis S. Peters) - *Red Lion*
Nells Venture (Herbert Pollock) - *Indiana*
Pumpkinhill Produce Farms (Harry N. Roinick, Jr.) - *Nescopeck*
Red Wagon Farm (Eric and Richard Ross) - *Columbia Station, OH*
Sample's Vegetable Farm (Steve Sample) - *Duncannon*
Dan Schantz Farm and Greenhouse (Daniel Schantz, Patrick Flanley) - *Zionsville*
Green Barn Berry Farm (Robyn and Jarod Schreiber) - *Muncy*
Seminole Produce Distributors - *Sanford, FL*
Shenk's Berry Farm (John E Shenk) - *Lititz*
Shenot Farms (Edward & Robert Shenot) - *Wexford*
Shipula Farms (Larry Shipula) - *Jamestown*
David Sokoloski - *Beaver Falls*
Snyder's Farm Market (George A Snyder) - *Grampian*
Bill Sterling - *Newtown*
William and Cheryl Troxell - *Richfield*
Van der Grinten Farms (Peter Van der Grinten) - *Guilford, CT*
Byron Waggoner - *East Berlin*

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National News Briefs

EPA Proposes Changes to Worker Protection Standards

Farm Bureau is reviewing changes the Environmental Protection Agency is making to its Worker Protection Standards governing the application of pesticides. Under the changes, which will go into effect after they are published in the Federal Registry, children under the age of 18 will be prohibited from handling pesticides. Employers will also have to conduct yearly training on pesticide protection, instead of the current standards of once every five years. Farmers will be required to post no-entry signs for some pesticides. Those signs will prohibit entry into treated fields until residues decline to safe levels. The standards also call for a 100-foot no-entry exclusion zone surrounding pesticide application equipment to prevent exposure to overspray. Farmers are committed to using all crop protection tools safely, but Farm Bureau wants to make sure the standards are based on sound science. "Farm Bureau shares the agency's desire to protect workers, but we are concerned that the agency is piling regulatory costs on farmers and ranchers that bear little if any relation to actual safety issues," said Paul Schlegel, director of environment and energy policy for the American Farm Bureau Federation. "We are hopeful the agency's final rule will reflect our concerns and protect farmers' and ranchers' ability to promote a safe, productive environment."

*From **Farm Bureau Express,** Penna. Farm Bureau, October 23, 2015.*

Whole Farm Revenue Protection Now Available Nationwide

The U.S. Department of Agriculture is making the Whole-Farm Revenue Protection insurance program available in every county in the nation starting in 2016.

Additional changes at the agency will make the program available to a wider range of farmers, including beginning farmers, organic producers and diversified crop growers.

The Whole-Farm Revenue Protection program provides coverage for annual crops and gives provisions for businesses undergoing expansions. The policy can cover farmers growing specialty and organic crops and those selling to direct markets. Whole-Farm Revenue Protection covers up to $8.5 million in insured revenue.

"Whole-Farm Revenue Protection insurance allows producers who have previously had limited access to a risk management safety net, to insure all of the commodities on their farm at once instead of one commodity at a time," said Deputy Secretary Krysta Harden. "That gives them the option of embracing more crop diversity on their farm and helps support the production of a wider variety of foods."

The USDA is also making several changes to Whole-Farm Revenue Protection, which is administered by the Risk Management Agency. They include:

Beginning farmers now only need three years of historical records and farm records from the past year. New farmers can also use a former farm operator's federal farm tax records if the beginning farmers assumes at least 90 percent of the operation.

Livestock farmers will now be able to insure up to $1 million of animals and animal products.

Caps on historical revenues have been increased to 35 percent from 10 percent to allow growing farms the chance to cover growth in insurance guarantee.

For more information, contact your local RMA office.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

Federal Court Orders EPA to Stop National Enforcement of WOTUS

Pennsylvania Farm Bureau (PFB) praised a federal court order that stops the Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps) from enforcing the highly controversial Waters of the United States (WOTUS) rule across the nation. The Sixth Circuit Court decision recognizes that the rule has serious flaws and provides a temporary stay until the court determines whether it has jurisdiction over the petitions in the case.

The rule is scientifically and legally flawed and clearly goes well beyond the authority granted to the agencies through the Clean Water Act. We are pleased that the court will have an opportunity to evaluate and understand the rule's impact on farmers, businesses, local communities and other landowners," said PFB President Rick Ebert. "Under the broad definitions included in the pervasive WOTUS rule, virtually all of Pennsylvania's land mass can be claimed by EPA officials as a 'regulated water,' subjecting landowners and communities to extreme and needless federal permitting requirements and land use restrictions."

In August, a federal court in North Dakota issued a temporary injunction against EPA and the Corps from enforcing WOTUS, but the decision only affected the 13 states specifically named in the lawsuit. In that case, the judge ruled that the states would likely be harmed if the courts didn't act and that the states would likely succeed when their underlying lawsuit against the rule is decided.

Despite overwhelming evidence that WOTUS lacks legal and scientific credibility, which have been documented by the Army Corps of Engineers, EPA continues to aggressively push for the implementation of the rule. It's time for EPA to ditch the rule and begin a new conversation with farmers and other stakeholders, who are also interested in improving water quality," concluded Ebert.

*From **Farm Bureau Express,** Penna. Farm Bureau, October 9, 2015.*

NRCS Finalizes State Offsite Methods to Determine Wetlands

The Natural Resources Conservation Service (NRCS) has finalized a plan to use in-office methods to determine the existence of wetlands such as soil maps and aerial photography rather than an NRCS employee visiting the farm to conduct field observations and secure soil samples. Farmers are concerned about the offsite method resulting in inaccuracies on wetland locations which could alter farm management plans and impact eligibility for crop insurance and other USDA programs. Many producers would prefer on-site visits from NRCS which would yield the most accurate data. The NRCS is experiencing a backlog of wetland determination requests and is using the State Offsite Methods as a way to determine the existence of wetlands and reduce the time needed to issue a confirmation to the producer. The State Offsite Methods are only applicable in four Midwestern states at this time but could be expanded to other parts of the country.

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*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

Congressional Committee Passes Bonus Depreciation

Members of the House Ways and Means Committee have approved legislation that would permanently extend 50 percent bonus depreciation. H.R. 2510 is now headed to the full House for consideration. Bonus depreciation, which expired at the end of last year, allows farmers to deduct half of the cost of new equipment purchases, rather than having to depreciate it over five or seven years. Farmers use this as a tax and income planning tool, since their income can fluctuate widely from year to year.

"The ability to take the deduction immediately allows the farmer to have extra cash in his pocket to make purchases when it makes sense and to plan them out," said Pat Wolff, a tax policy specialist with the American Farm Bureau Federation.

The Senate Finance Committee has already approved a two-year extension of a number of tax provisions, including bonus depreciation. However, both chambers of Congress appear to be far apart on how long those tax provisions should stay.

"So both the House and the Senate agree that this is a good provision but they are miles apart on how long the provision should stay on the books," Wolff said. "Farmers everywhere need to call their member of Congress and tell them that it's impossible to run a business when you don't know what the tax rules are and that Congress needs to give farmers and ranchers certainty now by passing the bonus depreciation bill now, instead of at the end of the year."

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

Applications Now Available to Enroll in the 2016 Conservation Programs

Applications are now being accepted by the Natural Resources Conservation Service (NRCS) for conservation programs in 2016 to help agricultural producers achieve environmental benefits. Agricultural practices such as nutrient management, reduced tillage, field buffers, rotational grazing, high tunnels and conservation practices on certified organic farms qualify for the funding assistance through the Environmental Quality Incentives Program (EQIP) and the Agricultural Management Assistance Program. The deadline for submitting applications for conservation programs is October 16. Applications may be accessed at: http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/pa/programs/?cid=nrcs142p2_018176.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

Farm Bureau Foundation Partners on Biotechnology Classroom Resources

The American Farm Bureau Foundation for Agriculture along with the International Food Information Council Foundation developed a curriculum guide on the use of biotechnology in raising crops. The "Bringing Biotechnology to Life" is

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a free education resource that is aimed at children between 7th and 10th grades. The partnership and guide was unveiled at the World Food Prize 2015 Borlaug Dialogue international symposium. "Many consumers do not understand the impact biotechnology makes on agriculture and our lives," said Julie Tesch, executive director of the American Farm Bureau Foundation for Agriculture. "Our goal is to have this resource provide students with the tools they need to make informed decisions about the practical uses of biotechnology. The resource guide uses seven lesson plans for educators, and are tailored to national learning standards. Topics covered include information about DNA, selective breeding and how biotechnology is used. A public presentation module is included for students to use and make presentations outside the classroom. For more information about the guide visit: www.agfoundation.org.

*From **Farm Bureau Express,** Penna. Farm Bureau, October 23, 2015.*

Federal Transportation Priorities

As Congress debates the future of highway infrastructure funding, agriculture organizations including Farm Bureau are calling on lawmakers to approve a multi-year bill that tackles long-term funding priorities. Farm Bureau is concerned the lack of long-term funding could eventually hamper adequate investment in highway infrastructure and the integrity of the nation's railway system—two vital methods for moving agriculture commodities to market.

Earlier this summer Congress extended the current federal transportation funding plan to the end of October. It also provided funding to shore up the Highway Trust Fund, which provides the bulk of funding for state governments to make highway repairs. Funding for the trust fund, which is paid for through federal gas taxes, has been lagging in recent years due to changing driving habits and increased fuel standards.

The last multi-year highway funding bill adopted by Congress was in 2012—and it was a two year agreement. Since then, that bill has been extended by several short-term agreements, leaving states and local governments without clear understanding of federal funding prioritization. The U.S. Senate reached a bipartisan agreement on a six-year highway bill, but the measure was unable to come to consensus in the House, resulting in the short-term extension expiring at the end of the month. The Senate plan would have placed billions of dollars into a program to improve freight transportation and improve the efficiency of project delivery, along with putting increased funding into the National Highway System and support innovative finance tools for state and local governments, particularly in rural areas.

Farm Bureau is asking for lawmakers to consider several critical areas as they craft the next federal transportation funding initiative.

They include:

- Extending the deadline for positive train control as required by Congress in a 2008 act. Positive train control is designed to prevent accidents such as train collisions and those caused by excessive speed. However, some railroads are worried they may be unable to meet the Congressional deadline. "Several railroads have indicated that they may be unable to move important crop inputs such as anhydrous ammonia on lines that do not have PTC installed. This development could threaten delivery not only of fertilizers and other inputs but other traffic on those lines as well," according to a letter sent to Congress by Farm Bureau and other agriculture groups. "If Congress does not extend the Dec. 31, 2015 deadline for installing PTC, fertilizer manufactures would likely curtail production, leaving farmers without enough fertilizer to use during the narrow planting season.
- Lower the federal minimum age for commercial driver's licenses to 18 from 21. Most states standards require CDL drivers to be 18 years or older; however federal standards prevent those drivers from crossing stateliness until they reach the age of 21.
- Clarify Congressional intent on regulatory relief from several Federal Motor Carrier Safety Administration regulations, including the ability of states to provide agriculture exemptions for hauling covered loads. The motor carrier administration is arguing it can withhold funding to state governments that provide exemptions to farmers hauling loads between fields or processing plants without covers. Farm Bureau wants lawmakers to clarify that "states may adopt standards that still provide safety but are more reasonable to farmers and employees operating farm trucks near the farm, without jeopardizing federal funding," Farm Bureau wrote to lawmakers.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

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State News Briefs

Governor, General Assembly, Remain at Odds Over State Budget

The entrenched budget battle continues. On October 7, House lawmakers rejected a tax proposal from Gov. Tom Wolf that would have raised the state's personal income tax rate and also enacted a severance tax on natural gas extraction. The measure failed on a mostly party line vote, with every Republican member of the House voting against the taxes. State Rep. David Reed, the House Majority Leader, said he the administration will move forward on budget negotiations. "We hope the governor and his administration will look at this vote in a realistic manner so we can move forward on negotiating a budget that makes sense for the taxpayers of Pennsylvania," Reed said. "It is time to come back to the table and honestly negotiate a reasonable and responsible spending plan to fund our schools and core functions of government." Gov. Wolf proposed raising the personal income tax to 3.57 percent from the current 3.07 percent, and a 3.5 percent severance tax on natural gas. Gov. Wolf said his proposal would expand property tax relief to seniors, and also put the state on a more sound fiscal footing. "If we do not fix our deficit, our credit rating will be downgraded to junk status and we will be forced to cut more funding from education," Gov. Wolf said. "More education cuts will lead to the layoffs of more educators, further increases to class sizes and skyrocketing property taxes. We must get Pennsylvania's financial house in order and invest in our future." The state's new spending plan, which was due June 30, is now more than 100 days late. Some schools and social services providers are starting to see serious consequences from the lack of new state funding.

*From **Farm Bureau Express,** Penna. Farm Bureau, October 9, 2015.*

Pennsylvania Farm Bureau Testifies in Support of Local Tax Bill

Pennsylvania Farm Bureau recently sent a letter to the House Finance Committee supporting legislation that would make the filing of local income taxes more consistent with state and federal income tax laws. The House committee is considering Senate Bill 356, introduced by Sen. Mike Folmer and adopted by the Senate, which would allow farmers to use the more simplified methods for reporting and payment of income taxes already provided through state and federal laws. Pennsylvania Farm Bureau said state and federal laws allow farmers to make one report and payment of estimated taxes, which is deferred until after the completion of the tax year. Farmers are not provided with similar options at the local level. Local tax laws also do not provide a "safe harbor" provision for the payment of estimated taxes. Senate Bill 356 would address both issues, along with making reporting and payment deadlines the same as state and federal. Pennsylvania Farm Bureau encouraged committee members to adopt the legislation.

*From **Farm Bureau Express,** Penna. Farm Bureau, October 9, 2015.*

REAP Applications Now Available

Pennsylvania farmers who want to use the Resource Enhancement and Protection (REAP) tax credit program can begin submitting applications. However, applications will not be acted on until the state budget is adopted. REAP provides tax credits for farmers who install best management practices or purchase equipment that reduces erosion or prevents nutrients from reaching waterways. The program is run by the State Conservation Commission. Farmers who have completed projects can now start submitting applications; those with proposed projects can submit applications on August 17. Investors can also act as a sponsor of the project and provide funding in return for tax credits. Since its inception in 2007, REAP has awarded tax credits to 3,900 projects totaling $50.7 million. Farms can receive tax credits of up to $150,000 for 50 to 75 percent of the total project costs. Common projects approved through REAP include the purchase of no-till equipment, manure storage, nutrient management plans and improving heavy animal use areas. For more information, or for an appli-

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NEWS

State News Briefs (continued from page 9)

cation, call Joel Semke at **717.705.4032** or ***jsemke@pa.gov.***

*From **Farm Bureau Express,** Penna. Farm Bureau, October 23, 2015.*

Fair Dealer Bill Introduced

A state representative introduced a bill to protect farm equipment dealers from onerous demands by equipment manufacturers in dealership agreements, including preventing manufacturers from restricting the types or models of equipment a dealer can sell.

Rep. Will Tallman, an Adams County Republican, introduced the bill, which addresses concerns farmers have had for a number of years that the extensive restrictions in sales of equipment lines and other requirements imposed by manufacturers are driving many dealers out of business. House Bill 1553 will provide many of the same provisions already afforded under state law to automobile dealers. Equipment dealers say agreements from manufactures are discouraging and in some cases preventing them from offering the range of equipment needed to service their customers and keep them financially viable. The prospect of fewer dealers driven out from manufacturer restrictions will make it even more difficult for Pennsylvania farmers to obtain the type of equipment they need. Pennsylvania Farm Bureau is working with lawmakers to achieve passage of the bill.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

Ag Departments Looking to Help Veterans

The Pennsylvania Department of Agriculture and the U.S. Department of Agriculture are organizing separate initiatives to showcase and assist military veterans in agriculture.

Pennsylvania has unveiled a new marketing program to highlight produce and products raised by military veterans while the USDA has partnered with military officials to offer agriculture and career counseling for active duty personnel that are transitioning into civilian life.

PDA recently announced the Homegrown by Heroes Program through PA Preferred that will allow eligible farmers to market their products with a special label saying those products were raised by a military veteran. Homegrown by Heroes is available to farmers and value-added producers who participate in the PA Preferred program and have served in the military, national guard or reserve. To learn more about Pa Preferred visit: www.papreferred.com.

In related news, the USDA and Department of Defense have announced a partnership to train 200,000 transitioning military service members each year, offering career training and counseling for agriculture jobs.

"Our transitioning service members leave the military with a variety of essential skills - including leadership and discipline - that could be directly applied to a career in agriculture," said Susan S. Kelly, Director of the Department of Defense's Transition to Veterans Program Office. "For those members who are considering farming or ranching as a post-service career, I encourage them to learn more about the opportunities, preferences, and incentives offered by the USDA."

Roughly 200,000 military members go through a transition assistance program each year as they ready for civilian life. This partnership will make sure that military veterans know about incentives for veterans available through the USDA including farm loans and rural housing opportunities. The USDA has made funding available for veterans to start farm businesses. The agency has awarded $438 million in farm loans to veterans since 2009.

*From the **Pennsylvania Agricultural Alliance Issues Update,** Penna. Farm Bureau, October 2015.*

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NEWS

Carolee Bull Named Plant Pathology Head

Dr. Carolee Bull joined the Department of Plant Pathology and Environmental Microbiology at Penn State as Professor and Head on September 1, 2015. Originally a Pennsylvania native, Dr. Bull graduated with a degree in Botany at Ohio University in 1985. She received an MS in Plant Pathology from Washington State University in 1987, and a PhD in Plant Pathology from Oregon State University in 1992. Her work on biological control of plant pathogens and phytobacteriology continued as a NSF Postdoctoral Fellow in Switzerland. For the past 20 years she worked for the USDA/ARS in California to develop alternatives to chemical pesticides for vegetable and small fruit production. She has had continuous funding from the California Leafy Greens Research Board during those 20 years and developed effective management strategies for bacterial diseases that affect Salinas Valley crops including lettuce, crucifers, umbels (cilantro, celery, fennel, parsley), many other vegetables, and strawberries. Dr. Bull served on the Administrative Council for the Western Sustainable Agriculture Research and Education Program and was key to organic research programing at the USDA/ARS. For outstanding mentorship of women and Latino student research interns, she received the Secretary's Honor Award (the highest award for service to the nation in agriculture) from USDA Secretary Thomas Vilsack.

Workshop on Listeria Control in Fresh and Fresh-Cut Produce

This workshop will be held on Friday, December 4, 2015 from 9:00 a.m. to 4:45 p.m. at the Fruit Research and Extension Center at 290 University Drive in Biglerville.

Listeria monocytogenes has long been a human pathogen of concern in the food industry, in particular among manufacturers of ready-to-eat sliced meats, raw milk, and soft cheeses. Unlike other human pathogens that can be transmitted through food, Listeria can grow in continuous wet and cool food production environments where it can survive for years or decades. Though rare, L. monocytogenes infections can cause serious illness or even death. A recent succession of recalls or outbreaks traced to Listeria-contaminated fresh and minimally processed fruits and vegetables (e.g. cucumber, celery, onions, cantaloupe, tree fruit, caramel apples) have alerted the produce industry of the importance of taking all possible measures to prevent contamination with this pathogen.

This one day course will provide a basic understanding of Listeria with particular focus on its importance in fresh and minimally processed produce. Sources of Listeria and mechanisms for controlling it in food packing, storage, and fresh-cut processing operations will be discussed. Lectures will be presented that include principles of facilities and equipment sanitary design, wash water sanitization, cleaning and sanitizing food-contact and non-food contact surfaces, and the basics of developing a microbial sampling and testing program.

This workshop is designed for those who pack, wash, and store fresh produce (e.g. whole tree fruits, melons, leafy greens) or who further minimally process produce (e.g. sliced apples, fresh-cut salad vegetables). The registration fee is $95 and the deadline is November 23. To register, go to http://goo.gl/eh4prF or call 877-778-2937.

Western PA Vegetable and Small Fruit Seminar is November 11

You are invited to attend a vegetable and small fruit production and marketing meeting for producers and industry representatives. The Western Pennsylvania Vegetable and Small Fruit Seminar will be held on Wednesday, November 11, 2015 from 8:00 a.m. to 3:30 p.m. at The Atrium at 1031 New Castle Road in Prospect.

Research-based information on best management practices will be presented in the areas of vegetable and small fruit production techniques, including soil and fertility management, cultivar selection, integrated pest management, and pesticide safety. Space is limited! Pre-registration is highly recommended – call 724-627-3745. Walk-ins will only be accepted as space permits.

NEWS

Vegetable and Berry Extension Position Available

The College of Agricultural Sciences is seeking an individual to specialize in **sustainable and organic vegetable and berry production** training as part of the Penn State Extension Horticulture Team. He or she will work with commercial growers, organic growers and beginning growers. This individual must have a background in horticulture including vegetable, berry or tree fruit production. Experience supporting new grower education and Spanish language proficiency preferred. This individual will work as part of the State-wide Horticulture Team serving vegetable, berry, tree fruit and wine grape growers in Northampton, Lehigh Counties and collaborating with colleagues to serve Southeastern PA. This position is a great opportunity to work with the Pennsylvania horticulture industry characterized by diversified small and medium size farms. Farmland with high quality soils and plentiful rainfall surrounding a rich metropolitan corridor provide markets for Lehigh Valley farmers and strong support for local and sustainable food systems. Primary responsibilities include: Facilitating and teaching workshops, study circles, and field days for commercial growers; teaching new grower curricula including sessions on plant propagation, crop planning, rotations, soils, managing plant diseases, insects and weeds for new organic vegetable growers; providing production consultations for commercial operations including farm visits, plant problem diagnosis, and production planning; consulting new farmers on horticulture farm start up, next generation farmers and those diversifying operations; collaborating in on-farm research and demonstration to test new practices and demonstrative innovative techniques; performing outreach through articles and online media. Provide new and commercial farmers with production information through articles and web content through extension and partner newsletters, magazines and websites; create and improve curricula and educational materials for example teaching activities, videos, activities, farmer case studies; completing timely projects for example food safety, protecting pollinators, soil health, and high tunnels based on stakeholder priorities; working with the team to write and secure grants and develop revenue enhancement strategies to obtain additional resources to initiate new educational programs or enhance ongoing programs; collecting and summarize evaluation data, create impact reports, monitor budgets and administer the sustainable agriculture program; collaborating as part of the Start Farming-Supporting the Next Generation of Farmers interdisciplinary program priority initiative effort. He or she will work with community stakeholders, farmers and team members to support new and next generation growers. This job will be filled as a level 3, or level 4, depending upon the successful candidate's competencies, education, and experience. Typically requires a Master's degree or higher plus two years of related experience, or an equivalent combination of education and experience for a level 3. Additional experience and/or education and competencies are required for higher level jobs. The individual must be able to work effectively in a team and with diverse populations and audiences. The successful candidate will need to develop and/or participate in interdisciplinary collaborations across multiple disciplines and institutions. All team members are expected to participate in the development of a diverse external funding (e.g. grants, contracts, cost recovery, development) portfolio in support of the team's programs. The home base will be Northampton County. Preference will be given to candidates with degree(s) in horticulture, plant pathology, soil science, entomology, or related disciplines and those that have related work experience in education or industry. Background in educational methodologies and Spanish proficiency preferred. Candidates should have a basic knowledge of and commitment to food and agriculture, and enjoy the challenge of working as a part of a team on a wide variety of educational efforts. Candidates must possess effective communication skills (verbal and written), teaching skills, interpersonal skills, ability to build effective working relationships with colleagues and clientele, and work as a member of a team. The candidate must be organized and able to manage multiple projects simultaneously. Desired experience includes: writing articles for clientele information and formal reports, managing grants, and providing leadership. Proficiency in use of computer software packages such as Word, Excel, Publisher and PowerPoint. Must have the ability to carry equipment, educational materials and supplies with or without accommodation and the ability to travel. Must possess a valid driver's license and use of a private automobile. Since this position requires that you operate a motor vehicle as part of your job duties, successful completion of a motor vehicle records check will be required in addition to standard background checks. This is a fixed-term appointment funded for one year from date of hire with excellent possibility of re-funding. Visit https://psu.jobs/job/59952 to apply. For best consideration, apply by October 30, 2015.

GENERAL

Sloop's Homegrown Produce

Nestled in Marysville, Perry County, Pennsylvania, Sloop's Homegrown Produce has been committed to producing and delivering high quality seasonal produce for its customers throughout generations. Bradley Sloop, the owner of the farm, is the first one in the family to grow produce on a large scale. He is currently a junior at Messiah College, where he is pursuing a degree in Civil Engineering. He commutes back and forth to school so he can keep the farm going.

A PA Preferred member, Sloop's Homegrown Produce, grows a wide variety of vegetables, with their best-selling items being tomatoes, corn, watermelons and cantaloupes. This family farm started with just an acre to grow produce on, to now having five acres. Sloop's Homegrown Produce has a strong commitment to implementing sustainable agriculture practices into their production, such as using plasticulture and drip irrigation to grow their crops while reducing the water usage. To expand the seasons of high value crops, such as cucumbers and peppers, several years ago they built a high tunnel.

Sloop's Homegrown Produce owns and operates a roadside stand as their main point of sale. The stand is located at 3260 Valley Road in Marysville and is open every day during the growing season. It creates a unique and convenient purchasing experience for its customers by utilizing the honor system. In addition, the farm also sells produce to restaurants, local grocery stores, and produce auctions.

Bradley has always enjoyed working on a farm. "I enjoy talking with my customers and developing a relationship with them," said Bradley. "I believe that it is very important for consumers to know where their food comes from and to develop a relationship with the producer."

Bradley would like to continue owning and operating Sloop's Homegrown Produce. "I would like to put more acreage into produce and maintain the farm while practicing as an engineer," he said. For more information about Sloop's Homegrown Produce, visit them online at https://www.facebook.com/sloopshomegrownproduce/ or call 717-350-6439.

Peppers and tomatoes growing in one of Sloop's fields.

MARKETING

Highlights from the "Are You Crazy" Bus Tour

Brian Moyer

More than 40 retail farm marketers attended the 2015 "Are You Crazy" bus tour to southcentral PA, West Virginia, and Loudoun County Virginia. This year's tour was ambitious with nine stops within two days.

The Penn State Extension Direct Marketing team carefully choose this year's stops which featured everything from large agritourism and retail to a small CSA (community supported agriculture) looking to expand their pickup location to include more retail purchases. A majority of our stops focused on best use of retail space. Some markets were looking to expand or rebuild their markets while others occupied a fairly recently built building and shared their thought process behind the construction and layout. All registrants received a market bag filled with educational materials, a clip board for taking notes, sponsor info and catalogue, and a tour book with descriptions and information for each one of our stops.

Our first stop, Windy Knoll Farm Market & Creamery, is based in Chambersburg, PA on the location of the family dairy farm and specializes in homemade ice cream and prepared foods. They talked about how creating a quality product draws customers to their out-of-the-way location.

Taylor's Farm Market is located in a market building formally run by the West Virginia Department of Agriculture. The Taylors operate a 1350 acre farm and are fairly new to retail farm markets and were quiet happy to share what they are working on and eagerly looking for any suggestions the group was willing to share to improve their market.

Our tour group enjoyed lunch at Orr's Farm Market in Martinsburg, WV. After twenty years, Orr's Market uses every inch of available space prompting discussions within the family about creating a new market to better serve their community.

Marker-Miller Orchards in Winchester, VA has been producing apples since the 1930's today they produce a variety of fruits and vegetables on 225 acres specializing in pick-your-own and baked goods and recently constructed a pavilion for special events and weddings.

Willowsford Farm in Ashburn, VA is part of 2000 acre conservancy and operates a Community Supported Agriculture (CSA) farm that serves the community that lives in and around the conservancy. They operate a roadside stand as a pick up location for the CSA shareholders as well as selling items for retail with the hopes of having a larger retail location in the future.

Burnside Farms is a mother and son team that have a seasonal market from fall through Christmas located on a busy highway surrounded by development and shared how they maintain that relationship with the community.

Ticonderoga Farms is a huge agritourist attraction in Chantilly, VA with many activities that would keep a family occupied and entertained for days.

Stoneybrook Farm has a modest size market in Hillsboro, VA and is part of an intentional that produces certified organic produce. The market is timber frame construction and also features a café.

Finally, our last stop at Great Country Farms in Bluemont, VA started as a CSA almost twenty years ago and has grown to a retail farm market featuring many activities and educational programs.

Between our stops we discussed the challenges of not being located on a busy main road and the methods they used to attract the public to their farms. We also talked about signage, lighting, displays and risk management among other topics.

Thank you to our sponsors Martin's Produce, Kitchen Table Consultants, and the Pennsylvania Vegetable Growers Association for their support and making this program possible.

For more photos from the tour check out these flickr sites from Carla Snyder & Juliette Enfield:

https://www.flickr.com/gp/112666094@N02/8793s6
https://flic.kr/s/aHskhqoHbP

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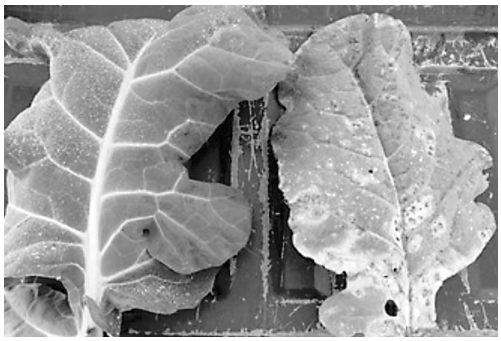
"Are You Crazy"... *(continued from page 14)*

VEGETABLE PRODUCTION

Alternaria Leafspot and Head Rot on Broccoli

Elsa Sanchez and William Lamont

In an experiment at the Russel E. Larson Agricultural Research Farm we have alternaria leafspot and head rot on the leaves and heads of fall broccoli planted. It's a common late-season disease.



A healthy broccoli leaf (on the left) next to one with alternaria leafspot (on the right).

When we visited Brian Campbell Farms last year, Rachel Troyer, the food safety and integrated pest management manager, mentioned it as one of the major diseases that is very closely monitored on the farm's 96 acres of broccoli.

Alternaria head rot on broccoli. Notice the yellow/brown/black spots that make the heads unsaleable.

Alternaria leafspot and head rot on broccoli is commonly caused by a couple of fungi: *Alternaria brassicicola* and *Alternaria brassicae.* Disease development is favored by cool temperatures and long periods (more than 9 hours) of high moisture. Fungal spores can be moved in a variety of ways: with wind currents, with splashing water, on equipment, on animals—including people, and in/on infected seed.

Leafspot symptoms start off as small yellow spots on older leaves that develop into ? inch diameter or larger "bull's eyes" or "targets" with concentric rings of varying shades of tan/gray/black. Alternaria head rot also starts off as yellow spots that turn brown and black. You will see black spores on spots on leaves or heads.

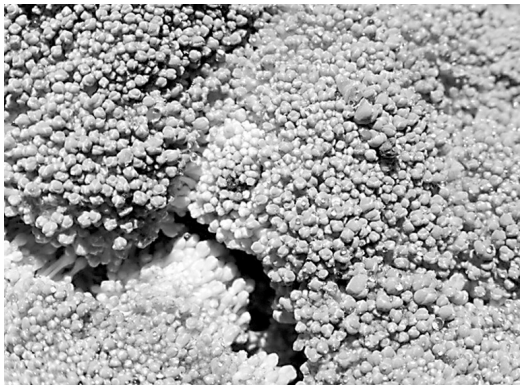
Note the spots of concentric rings of varying shades of tan/gray and black which is characteristic of alternaria leafspot.

Alternaria head rot can be confused with bacterial head rot. Bacterial head rot starts off as water-soaked spots on the head. Spots are soft and have a very bad odor as the disease develops.

There are some things you can do to minimize or avoid having this alternaria leafspot and head rot:

Practice a 2-3 year crop rotation away from brassicas to limit build-up of these fungi.

Manage weeds that are in the brassica family because they can be hosts for these fungi. Weeds include wild mustard, shepherd's purse, hairy bittercress, field pepperweed, and field pennycress.



Close-up of a lesion of an alternaria head rot spot.

Promote leaf drying to help create an environment that is less suitable for the disease to establish. Practices include choosing sites with good air and soil drainage, orienting rows with prevailing winds, using drip irrigation, and avoiding overcrowding plants through close spacing

Treat seed with hot water to kill the fungus on the seed surface. Page E39 of theCommercial Vegetable Production Recommendations guide for Pennsylvania has information on how to do this. You need to be very precise with this technique for it to work. Buying seed that is heat treated or treated with other alternatives to heat from seed companies is ideal.

Soil incorporate crop residue immediately after harvest to minimize the amount of fungal spores that can be moved to healthy plants.

Research shows that the use of straw mulch can help minimize this disease.

In general, it is difficult to manage this disease with fungicides because it appears during wet periods. In our field we had to wait almost a week before we were able to spray because of rainfall.

This is from the Resource Guide for Organic Insect and Disease Management. Copper compounds are labeled, but have not been effective in recent studies (two poor results).

The fungicide options below are from the Commercial Vegetable Production Recommendations Guide for Pennsylvania.

Use one of the following at the first sign of disease and continue every 7 to 10 days.

Azoxystrobin – 6.0 to 15.5 fl oz 2.08F/A or other labeled formulations

Fontelis – 14.0 to 30.0 fl oz 1.67SC/A

Cabrio – 12.0 to 16.0 oz 20 EG/A

Endura – 6.0 to 9.0 oz 70WG/A

Chlorothalonil – 1.5 pt 6F/A or other labeled formulations

Ridomil Gold Bravo – 1.5 lb 76.5WP/A (14-day schedule)

Switch – 11.0 to 14.0 oz 62.5WG/A

Materials with different modes of action (Fungicide Resistance Action Committee–FRAC code) should be rotated.

Dr. Sanchez and Dr. Lamont are with the Department of Plant Science at Penn State Univ. *From the* ***Vegetable, Small Fruit, and Mushroom Production News,*** *Penn State Extension, extension.psu.edu/plants/vegetable-fruit/news, October 19, 2015.*

High Tunnel Season Extension

L. McKeag

Public interest in purchasing locally grown food has grown immensely in recent years throughout New England and across the US. Growers have responded by keeping farm stands open longer, creating winter farmers markets, and offering various forms of 'winter shares' at CSA farms. Traditional storage practices combined with improved production technologies can be utilized to generate, store and market more food to satisfy market needs.

High tunnels (sometimes called hoop houses or field houses) are generally unheated structures that allow for growing in the ground in a warmer and more protected environment. These structures can be used to extend the growing season into late fall, winter, and early spring. There are many factors that contribute to the success of winter-time production in a high tunnel. Here are some general guidelines to consider when planting and managing extended season crops in high tunnels.

Crops

Choose cold hardy varieties. Brassicas, alliums, umbels, and chenopods are all families that include vegetable varieties with cold hardiness. When planning your plantings and choosing seed, look for varieties that are specifically labeled to be cold hardy. In winter high tunnels, they will be subjected to subfreezing temperatures and multiple freeze-thaw cycles.

Some crops will only be in the ground for a relatively short time, while others will need longer to mature for harvest. Below are some good variety choices in each category.

Suggestions for shorter residency varieties:

- Spinach: Space, Tyee
- Brassica greens: Red Russian Kale, Tatsoi, Komatsuna, Mizuna, Green Wave
- Bok Choi: Black Summer, Mei Qing Choi
- Lettuce: Tango, Red Salad Bowl, Rouge, D'Hiver
- Claytonia

Suggestions for longer residency varieties:

- Radish: Tinto, Cherriette, D'Avignon
- Beet: Red Ace, Merlin, Touchstone Gold
- Chard: Fordhook Giant
- Leek: Tadorna
- Scallion: WhiteSpear
- Turnip: Hakurei
- Carrot: Napoli, Mokum, Nelson
- Kale: Winterbor, Redbor, Toscano, Siberian, Red Russian
- Collards: Champion
- Head Lettuce: Scyphos, Ermosa, Winter Density

Some seed companies are beginning to market specifically to extended season growers and have sections of their catalogs dedicated to appropriate varieties and cold season growing supplies.

Planting Schedule

"Days to maturity" are longer as the daylight hours get shorter, light intensity decreases, and temperatures drop. The

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High Tunnel... *(continued from page 17)*

date that crops are seeded, the climate in your growing zone, the microclimate both on your farm and inside of the high tunnel, and the severity of the weather in a given year will all affect plant growth and survival. Short intervals between seeding dates become longer intervals between harvest dates. Cutting lettuce and

Brassica crops need to be seeded on many dates at close intervals. Full sized kale, chard, collards, spinach — plants where you harvest just the outer leaves — need only 1 or 2 dates. Be careful with seeding dates during the period with less than 10 hours of daylight. In New England, this is from around the second week in November to the fourth week in January.

Some farmers have had success planting in this date range, but there are also reports of poor germination and early bolting.

Good record keeping over the years will help you to develop a fall seeding schedule that is specific for your farm.

Degree of Protection

In the fall, as plants become established and grow, their cold tolerance can be enhanced by keeping the tunnel sides open, even at night, and forcing them to adapt to the declining temperatures. This may seem counter to the first instinct, which is to make the most of the protective capacity of the tunnel. However, plants exposed to cold from early on will be better able to survive the sudden drops in temperature and freeze periods that are sure to come.

Once subfreezing temperatures become the norm, maximizing protection becomes important. There are ways to increase the degree of protection in your high tunnel including covering the tunnel with a thicker greenhouse plastic, using a double layer of plastic, and using floating row cover on crops inside the house. For more information on choosing the cover for your high tunnel, see this article by John W. Bartok, Jr., Choose the Right Plastic Film for Your Needs at http://www.greenhousemag.com/article/gmpro-0510-choose-right-plastic-film-polyethylene. Inner covers are most effective when they are within a couple of feet of the plants; some crops will tolerate covers without hoops, but most growers use some kind of supports. Multiple covers can be used to protect plants during the coldest weather. High tunnels are generally heated and cooled passively with the use of ventable sides and end walls and trapping of solar heat, but supplemental heat can be used to protect from deep freezes. Portable propane heaters or wood stoves are two options.

Good ventilation and airflow are also important in managing humidity inside tunnels. Lowering humidity reduces the potential for disease, and also reduces icing of plants from condensation, which leads to leaf damage. End vents are an important tool for ventilation, even in subfreezing weather. Proper ventilation also means protecting plants from damaging winds. If plants do become frozen, protect them from cell rupture by not touching them while they are frozen. Time your harvests for mid-day or on warmer-forecasted days to avoid touching frozen plants.

Pest Control

Extending the growing season for crops also means extending the potential for damage from pests. Rodents can be a big problem in high tunnels. Prevent damage by reducing year-round habitats for small animals near high tunnels. Grass should be mowed very short and perimeters should be kept weed-free. Make sure wood piles, rock piles, equipment, etc. are moved away from tunnels.

Set traps inside the house all winter long.

The high tunnel environment differs from outdoors in winter: it's warmer, has less free moisture, and is more humid. As a result, different diseases are common in tunnels than are common on the same crops grown outdoors. The most effective way to prevent plant diseases in high tunnels is to manage humidity by ensuring sufficient ventilation, and running fans if necessary.

Insect pests tend to be less active in colder seasons, but problems with pests such as aphids, whiteflies, and slugs may develop. Early establishment of bio-controls or use of insecticidal soaps can be very effective. When it comes to chemical controls, use only materials that are labeled for greenhouses. Outdoors, pesticide residues break down after application by exposure to ultraviolet radiation and rainfall. Inside tunnels, plastic coverings reduce U/V and don't allow in rain, and as a result, pesticides break down differently.

For more information on high tunnels and extended season growing, including pest control, see the Pennsylvania Commerecial Vegetable Production Recommendations.

Other good resources are the following websites:

- https://ag.umass.edu/vegetable/resources/winter-production-storage
- http://ag.umass.edu/greenhouse-floriculture and
- HighTunnels.org.

Compiled by L. McKeag, with the Univ. of Massachusetts Extension, from information by Danya Teitelbaum, of Queen's Greens Farm in Amherst and formerly with the Univ. of Mass. Extension, as well as the sources referenced above.

Reprinted from the ***Vegetable Notes for Vegetable Farmers in Massachusetts,*** *Univ. of Mass. Extension, Vol. 26, No. 23 October 9, 2014.*

Protect Bees from Pesticides

Christina Grozinger and Shelby Fleischer

Not only insecticides but also some fungicides and herbicides are harmful to bees. The following are some general guidelines to protect bees from pesticides.

- Practice Integrated Pest and Pollinator Management (IPPM). Using IPM (integrated pest management) growers have reduced pesticide use and environmental impact by using cultural controls and host plant resistance as the first line of defense against insects and diseases, monitoring for pests, and applying the least toxic alternative only after an economic threshold has been reached. IPPM adds the element of balancing pollinator health with crop health. It also incorporates practices that conserve pollinators. Take a look at

(continued on page 19)

Protect Bees... (continued from page 18)

the specific example for pumpkins from Dr. Shelby Fleischer in the table at the end of this article.

- Identify and confirm hive locations and maintain appropriate buffers.
- Select insecticides and fungicides that have the lowest toxicity rating to bees whenever possible. See Table 4 from How to Reduce Bee Poisoning from Pesticides, L. Hooven 2013. Oregon State Extension. (https://catalog.extension.oregonstate.edu/files/project/pdf/pnw591.pdf)
- Apply pesticides with residual toxicity when bees are not present or are inactive. Bees generally forage during daylight hours. Applying pesticides after dark will reduce direct impact.
- Do not apply insecticides to blooming plants including weeds.
- Reduce herbicide use, and take measures to confine application to the field. Herbicides can reduce the abundance and diversity of flowering plant species at field edges that pollinator rely on for nutrition.

Practice	Comments about this Practice for Pumpkin / Squash
Rotation	Rotate after land that did not have any neonicotinoids applied, including seed treatments
Maintain proximity to last year's pumpkins	Helpful for squash bee, *Peponapis pruinosa* But increases pressure from cucumber beetles, squash bug, and squash vine borer
Tillage	No-till is helpful Consider tillage methods and timing that allow squash bees that established nests in pumpkin to overwinter
Cultivar	For squash, use transgenic cultivars resistant to aphid-transmitted viruses
Neonicotinoid insecticide (or any other systemic)	Seed treated only No foliar neonicotinoid
Foliar sprays - timing	After flowers close
Foliar sprays – choice of materials	Minimize RT_{25} if flowers still present If aphids become a problem, use selective aphicides (Beleaf, which is flonicomid)
Floral provisioning	Target plants that are visited by the Common Eastern Bumble Bee,*Bombus impatiens*
Scouting - Pests	Scout, spray only when thresholds exceeded, to slow pest establishment, and minimize pathogen establishment

Dr. Grozinger and Dr. Fleischer are with the Department of Entomology at Penn State Univ. From the ***Vegetable, Small Fruit, and Mushroom Production News,*** *Penn State Extension, extension.psu.edu/plants/vegetable-fruit/news, October 13, 2015.*

VEGETABLE PRODUCTION

Sweet Potato Harvest and Storage

Ruth Hazzard

Sweet potato acreage is steadily increasing in New England [and Pennsylvania] as it becomes clear that this crop can yield well, store well, and has a strong market. The sweet potato's harvest and storage needs differ from other common New England root crops.

Once harvest is completed—generally by early to mid-October—curing and storage issues continue to be important.

Harvest. Sweet potato roots continue to grow until the leaves are killed by frost or until soil temperatures fall consistently below 65°F, whichever comes first. Time of harvest is often determined by digging up a few representative plants and determining the percentage of roots in different size classes. The crop can be harvested whenever the majority of the roots are the desired size. When tops of the plants turn black after the first frost, it is imperative to harvest as quickly as possible regardless of root size.

Chilling injury can occur in the soil, if soil temperatures drop to 55°F or below. It is also important to avoid holding sweet potatoes in saturated, low-oxygen soil conditions prior to harvest, because this promotes rapid decay in storage.

Sweet potatoes are very susceptible to damage at harvest. Sweet potato roots do not have a thick protective outer layer of cells such as that on white potato tubers. Abrasions and wounds can lead to rots in storage.

Curing immediately after harvest is recommended when sweet potatoes will be held in storage for retail or wholesale sales. Curing minimizes damage and loss during storage by healing harvest wounds. Also, a freshly harvested sweet potato is more starchy than it is sweet. During curing and storage, starches in the sweet potato are converted to sugars, improving flavor. The change in sugars is measurable within one week, but it is recommended to wait at least three weeks after harvest before consuming sweet potatoes to permit the starches to convert to sugars for maximum eating quality.

To cure, maintain roots in temperatures between 80°F to 86°F and a high relative humidity (85-95% RH) for 4 to 7 days. Respiration rate is high during curing, so ventilation is important to remove CO2 and replenish O2. This forms a corky periderm layer below the damaged areas that limits microbial invasion and water loss. A greenhouse can provide good curing conditions.

Storage. Sweet potatoes can maintain excellent quality for up to a year in proper storage conditions. The ideal storage conditions for sweet potato are the same as for winter squash; moderately warm (55-60°F) at 60-75% relative humidity.

Like winter squash, sweet potato suffers chilling injury at temperatures below 55°F and grows more severe at lower temperatures or longer periods of exposure. Signs of chilling injury include shriveling, sunken, dark areas on the tuber surface, and blackening of tubers when cut open. 'Hardcore' is a physiological disorder cause by chilling, in which areas of the tuber become hard, but this condition only appears after cooking. Because chilling injury is irreversible and makes tubers unmarketable, growers should take particular care to avoid field, curing or storage conditions that dip below 55°F.

Tuber damage from wireworms can occur during the growing season and reduce marketability. More work needs to be done to understand which species is causing the damage, but likely candidates are corn wireworm (Malanotus communis) or wheat wireworm (Agriotis mancus). Both feed on roots, stems, stolons and tubers and are pests of potato, sweet potato, other non-root vegetables crops, and grains such as wheat and oat, as well as sod and grassy cover crops such as Sudangrass.

Adults are most active in spring (April-June). Eggs are laid in soil and larvae feed and develop for 2, 3 or 4 years. They can survive periods without food, essentially waiting for new crops to come along. Corn wireworm adults may be especially attracted to grassy cover crops such as Sudangrass thus, keeping fields free of those during peak egg laying is advisable. It is difficult to trace the history and cause of wireworm damage, because it is often 2-4 years after eggs are laid before the damage becomes noticeable or serious.

Damage is likely to be worst when larvae are nearly full grown. Corn wireworm larvae are also favored by wet soil conditions thus, damage may be heavier in wet areas. There are baiting methods to sample for larvae before planting.

Voles love sweet potatoes and can take up residence in the sweet potato field, causing significant damage. Voles may be deterred by maintaining a clean cultivated border around the planting, and keeping nearby areas weed-free or well mowed to minimize good hiding areas. Timely harvest may reduce the level of damage. Watch storage facility for vole activity after harvest.

Yield studies were conducted for several years by Becky Sideman at University of New Hampshire. Best yields were found with the varieties Beauregard, Covington and O'Henry (a white-fleshed variety). A good yield was 2.5 lbs per plant; equivalent to >65 lbs per 20 row-feet, assuming 9 inch spacing between plants in a single row. Reports on Becky Sideman's sweet potato work can be found at: http://www.mofga.org/Publications/MaineOrganicFarmerGardener/Spring2009/Sweet Potatoes/tabid/1081/Default.aspx and in the related fact sheet, Growing Sweet Potatoes in New Hampshire.

Adapted by Ms. Hazzard, who was formerly with the Univ. of Massachusetts Extension, from the Sweet Potato section of the New England Vegetable Management Guide, nevegetable.org; articles by Becky Sideman, Univ. of New Hamsphire Cooperative Extension; wireworm information from J. Capinera Handbook of Vegetable Pests. From ***Vegetable Notes for Vegetable Farmers in Massachusetts,*** *Univ. of Massachusetts Extension, Vol. 26, No. 22, September 25, 2014.*

Potato Storage Management

Ruth Hazzard and others

Whether you're planning to store potatoes for one month or six, it's important to try to provide the best combination of conditions for maintaining optimum quality. This can be tricky; every crop is different, as are each fall's weather and harvest conditions.

Whether you are storing in pallet bins, grain sacks, or bulk piles, it's important to know what conditions you are aiming for, even if you can't always achieve them in practice. Fortunately, vegetables in general and potatoes in particular are somewhat forgiving in their tolerance to less than 'ideal' conditions. Light, temperature, humidity and ventilation all need adjustment in potato storage, and achieving the desired conditions in these areas is covered in this article.

Preparing the Storage

Maintaining a pathogen-free storage environment is critical to successful storage. All storage and potato handling equipment surfaces should be thoroughly cleaned and disinfected prior to handling and placing the crop into storage. Surfaces should be well moistened by the disinfectant spray. Spray bin walls until there is a slight runoff. Recommended disinfectants are quaternary ammonium compounds such as Hyamine 2389. Bins or equipment treated with quaternary ammonium compounds must be rinsed with clean water before coming into contact with potatoes to be used for human consumption. Read labels carefully regarding use on walls or floors versus use on 'food contact surfaces' and to determine suitability for your needs. Organic produce may not come in contact with surfaces that have been treated with quaternary ammonium compounds.

Curing

The curing period, often referred to as suberization or wound healing, is one of the most critical storage phases. The curing period is also essential for the thickening and setting of the skin. This will increase the tuber's resistance to moisture loss and minimize entryways for rot-causing disease organisms. Wound healing is dependent on temperature and relative humidity. Maintain temperatures in the range of 50-60°F with a relative humidity of 95% for 10 to 21 days. A low relative humidity will result in poor suberization and the formation of a starchy layer over any bruises, preventing healing.

Weight loss is highest during the curing phase due to a combination of moisture losses from cuts and bruises and high respiration rates. As much as 2-4% of the tuber weight can be lost in the form of water during the first month. If managed properly, this water loss can be minimized, and can also be used to one's advantage as a means of maintaining the high relative humidity needed during the wound-healing process.

Uniform air movement is necessary during the curing process to remove heat of respiration and field heat, to supply oxygen, and to prevent condensation within the pile. Monitor temperatures within the tuber bins or pile to avoid heat buildup which increases tuber rot. Humidity should also be monitored. If available, a humidifier should be used to maintain the ventilating air at a relative humidity of 95%. Where a humidifier is not used, naturally occurring humid air can be used for ventilation, for 3 to 6 hours per day. In a through-the-pile forced air ventilation system, fans should be operated minimally, usually only 1 to 2 hours per 24 hours to provide sufficient oxygen while minimizing moisture loss.

Curing may be accomplished within the space that will be used for storage, or in a different location. Diversified farms and those who are in the process of building up their fall/winter storage infrastructure may find it more challenging to provide the conditions for this step. On a small scale (up to about 1100 cubic feet), curing can be accomplished using a Cool-bot and humidifier in an insulated space. A combination of vents and fans to exhaust warm air and bring in cool air, controlled with RH and temperature sensors, can make best use of outdoor conditions to manage the indoor environment. Good environmental control is very difficult in open barn situations.

Since even low light levels can cause development of chlorophyll (greening) and bitter, toxic glycoalkaloids, that render tubers unmarketable, all curing and storage should take place in the dark. , but One to two weeks in low light results in greening, and higher light levels cause faster greening.

When tuber quality is poor. Potatoes affected by freezing injury, Pythium leak, late blight or soft rot will break down at normal curing temperatures. Eliminate the curing period, grade out the rot and sell immediately, or cool rapidly to 45 with low to medium RH. Questionable potato lots should be harvested closer to 55° F if they must be stored. Freezing occurs at 30°F, but chilling injury can occur after a few weeks at 32°F. Note that fields that were flooded by river water are considered contaminated and should not be harvested.

Light

Darkness is key. Even modest amounts of low light cause greening. If potatoes are in a multi-purpose storage where lights are on often, or the room is not fully darkened most of the time, cover the bins or pile to keep out light, without cutting off ventilation. One solution is to use bulk bins with open bottoms, with black pallet wrap around the sides, and punched plastic row cover or burlap on top.

Temperature

After harvesting and curing potatoes for storage, tubers should be cooled down to the holding temperature. Ideally, the potatoes should be cooled slowly, ? to 1°F per day, or a maximum of 4 to 5°F per week. It's helpful to place a temperature sensor in the center and on top of the pile or bin to monitor tuber temperature, in addition to monitoring air temperature in the storage and outdoors.

Potatoes are most commonly cooled using outdoor air, but this should be managed carefully. For the best use of outdoor air, place temperature sensors inside and outside the storage, with thermostats and switches wired in series to bring air in with fans only if inside temperature is above, and outside temperature is below your desired set point. Use outdoor air that is no lower than 3 to 5° F below the tuber temperature. Through-the-pile (or through-the-bin) ventilation achieves rapid cooling, but may cause dehydration unless a humidifier is used. Air exhaust is also critical, to remove warm air.

Tubers whose temperatures fluctuate along with outdoor cool and warm spells may have reduced storage life and quality. Fluctuations in temperature may also lead to condensation in the pile. If the temperatures in the top and center of the pile are above the outside air temperature, then ventilate the storage. When night temperatures are warm (in the 50's and lower 60's)

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Potato Storage... (continued from page 21)

and there is not enough ventilation through the pile, the temperature in the pile can get into the 70's or even 80's. Heating is generally not needed in potato storage due to the heat of respiration from the potatoes, though insulation in walls and roof is important. Significant heat can also be lost through leakage around doors, windows and open doors during use.

The holding temperature should be suited to your market goals and to achieve the desired balance among respiration rates, sprouting, disease development, and transformation of starch into sugars such as glucose. Respiration rates are lowest at 36 to 37°F (2 to 3°C); however at temperatures below 45°F, conversion of starch to sugar increases. Tuber rots increase greatly above 50°F. References and grower experiences don't all agree on the ideal temperatures for different uses, but the recommendations below are found in several reliable sources.

Tablestock (no sprout inhibitor) and seed stock: 38 to 40°F. This is the optimum temperature range for inhibiting sprouting. Some growers report that they can hold at 36°F for fresh market sales during the winter months. For diversified farms, this may allow them to store other root crops and cabbage in the same storage room as potatoes, if infrastructure is limited.

Tablestock (with sprout inhibitor): 40 to 45°F. If the humidity is kept high and sprout inhibitors are used, potatoes stored at 45°F will maintain quality similar to those stored at 40°F.

Seed potatoes: 38 to 40°F. For seed, tubers need to be kept dormant and in a sound, viable condition.

Processing: 45 to 55°F is recommended for processing potatoes, to prevent accumulation of sugars which darken the potato during cooking. 50 to 55°F is recommended for chipping, although this varies with cultivar. High sugar levels can be lowered if the temperature is slowly elevated to 55 to 65°F for one to four weeks, a process known as reconditioning.

Managing Relative Humidity

Humidity should be maintained at 90 to 95% throughout storage life to prevent dehydration and shrinkage and reduce pressure bruising. Given high relative humidity (RH) inside and low RH and temperature outside during the winter months, adequate insulation in walls and roof is important to avoid condensation. Below are two options for adding humidity.

A humidifier with a capacity to deliver about one gallon of water per 1,000 cubic feet per minute (CFM) is usually adequate. Centrifugal and misting humidifiers introduce water into the atmosphere in small particles. These small water particles are easily absorbed by the cool air and effectively increase RH. These systems are the most reliable and effective, however they are also the most expensive. There are several models and sizes available to fit individuals' specific needs.

Chris Callahan at UVM Extension developed a simple DIY auto-fill humidifier using a five gallon bucket, a tank deicer for heat, and a fan. Details on this humidification system can be found at http://blog.uvm.edu/cwcallah/2014/03/04/diy-auto-fill-humidifier/.

Introducing water into the storage area is another option for increasing relative humidity. It is the cheapest but also the most unreliable and inconsistent, and can lead to unsanitary conditions. Methods for spreading water on the floor can be simple or fancy. One example is to use the condensate from the evaporator coil and direct it via tube to the floor, and spread evenly using drip tape as with trickle irrigation. Other options are to pour water on the floor, wet burlap bags, or use overhead greenhouse irrigation to spray water. Again these are the cheapest methods but are not ideal due to sanitary issues and their inconsistency.

Measuring Relative Humidity

Digital hygrometers are the easiest tools for measuring relative humidity. They are easy to read, and tend to be precise. However, they can be out of calibration or give false readings, especially at higher relative humidity levels (>90%) like those needed in potato storages. Sling psychrometers are simpler mechanical hygrometers. They use two thermometers to measure dry-bulb and wet-bulb temperatures; the difference between these temperatures is used to determine the specific relative humidity of the atmosphere. Digital hygrometers should be checked against a sling psychrometer to measure their accuracy. If a digital hygrometer were off by 5%, you will know this by calibrating it against a sling psychrometer and have a better idea of the actual RH of the storage.

Ventilation

The ventilation system is the heart of the storage, controlling temperature and humidity by ventilating, recirculating and blending air. These systems range from manual to totally automatic. Convection currents cause heat to rise through the pile or bins. An exhaust fan is placed so that it removes warm air from the top of the storage. Intake fans and openings should be adjustable to control the amount of air being drawn in. It is important that air is allowed to flow around and through the potatoes, whether they are stored in bulk or in bins. For bulk storage, air should be directed from the bottom of the pile towards the top, which requires a ventilation system that is built into the floor or laid down during piling. For storage in bins, the air should be directed to flow through the bins either from bottom to top or side to side (see Belyea presentation, below, for details on how a bottom-to-top system can be designed). This allows for consistent temperatures and relative humidity throughout the storage and thus consistent tuber conditions.

Further Reading:

- See Chris Callahan's blog at the http://blog.uvm.edu/cwcallah/ for further information and tools on calculating exhaust needs and fan exhaust system specifications.
- For an excellent review of storage design with a lot of detail in terms that non-engineers can understand, see the presentation by Stephen Belyea, storage engineer with the Maine Dept. of Agriculture, Food and Rural Resources at http://extension.umass.edu/vegetable/sites/vegetable/files/pdf-doc-ppt/EngineeringWinterStorage%20S.%20Belyea%20NEVFC%202011.pdf#overlay-context=projects/post-harvest-and-storage-resources.
- The UMass Vegetable website on storage resources at https://extension.umass.edu/vegetable/projects/post-harvest-and-storage-resources provides a view into storages built by several growers and other presentations and fact sheets on storage.

This article is combination of two articles. The first was updated by R Hazzard, K. Campbell-Nelson, S. Scheufele and M.B Dicklow. Sources include 'Potato Storage Management: Curing and Cooling' by S. Menasha, Vegetable/Potato

(continued on page 23)

GREENHOUSE

Greenhouse Insulation

John Bartok, Jr.

There are several simple and inexpensive steps you can take to reduce energy use during the heating season.

• Reduce air leaks by weather stripping doors, vents, and fan openings. Lubricate fan shutters frequently so that they close tight. Shut off some fans during the winter and cover openings with insulation or plastic.

• Make certain to apply two layers of poly as glazing. Choose a brand with an infrared inhibitor for the inner layer.

• Insulate the perimeter for the house below ground by installing 1 - 2 inch thick insulation board up to 2 feet below ground level will reduce the heat loss from the warm interior soil to the cold ground outside.

• Insulate sidewalls and endwalls to bench height using either a 2 inch foam board, or inexpensive aluminum-covered bubble insulation. Insulating existing structures is worthwhile. Cost of foam board insulation is about $1/sq ft with a payback of less than one heating season.

• Insulate behind sidewall heat pipes. Use insulation board or aluminum-faced building paper to radiate heat back into the greenhouse. Leave an air space next to the wall to prevent frost damage to the wall.

• Install an energy screen and save as much as 20%- 50% on heating costs. Screens trap the heat inside and reduce the heat loss surface area. Tight closures should be maintained where curtains meet sidewalls, framing or gutters.

Add roll-up or drop down sidewall screens for additional savings. These can be either manual or mechanized.

• Perform yearly maintenance on boilers, burners and back-up systems. Clean and adjust furnaces and do an efficiency test run before heating season. Consider upgrading the efficiency of your system with installation of root-zone heat tubing, a high-efficiency heater or boiler, or an insulated water tank for heat storage. Cost-effective alternatives to fossil fuels are also available.

Dr. Bartok, Jr., is an Agricultural Engineer, from Ashford, Connecticut. from the Vegetable Notes for ***Vegetable Farmers in Massachusetts,*** *Univ. of Mass. Extension, Vol. 26, No. 23 October 9, 2014.*

POTATO PRODUCTION

Potato Storage... *(continued from page 22)*

Specialist, LI Fruit and Vegetable Update 2012 & 2014, CESuffolk County; ***New England Vegetable Management Guide; Potato Production in the Northeast:*** *A Guide to Integrated Pest Management, Chapter 5 by Dale D. Moyer 'Potato Storage Management'; and USDA Handbook 66, Potato. From* ***Vegetable Notes for Vegetable Farmers in Massachusetts,*** *Univ. of Massachusetts Extension, Vol. 26, No. 22, September 25, 2014.*

The second was written by Ms. Hazzard and Luke Doody. Resources include Dale Moyer's (Suffolk Co CES, Riverhead, NY) chapter on Potato Storage Management in ***Potato Production in the Northeast,*** *edited by C Hollingsworth, D. Ferro and W. Coli 1986; USDA Handbook 66; and potato growers including Paul and Kevin Jekanowski, Jekanowski Farm, Hadley MA, and Rob Johanson, Goranson Farm, Dresden ME. From Vegetable Notes for Vegetable Farmers in Massachusetts, Univ. of Massachusetts Extension, Vol. 26, No. 23, October 9, 2014.*

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Needed: Nominations for PVGA Directors

The terms of six members of the PVGA Board of Directors expire at the Annual Meeting scheduled for Wednesday, February 3, 2016, at 11:30 a.m. at the Mid-Atlantic Fruit and Vegetable Convention in Hershey. All are eligible for re-election under the 18-year term limits set by the Board. The Directors whose terms expire are as follows:

- David King – Valencia – first elected 2013
- Lois Klinger – Catawissa – first elected 2001
- William Reynolds – Waynesboro – first elected 2007
- Robert Shenot – Wexford – first elected 2007
- Jonathan Strite – Harrisburg – first elected 2010
- Timothy Weiser – York Springs – first elected 2007

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