



PASA

Sustainable Agriculture

2018 Annual Report

July 1, 2017–June 30, 2018



Advancing the art



science of sustainable farming

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“We’re a community of farmers and supporters, focused on education and evidence-based research, for the purpose of building a more economically-just, environmentally-regenerative, and community-focused food system.”

DIRECTOR'S NOTE



Dear friends,

PASA's work is powered by your energy. Nearly every day, we hear how grateful our community is to have each other and we love supporting this important network. Countless times each year, I am approached by members and supporters expressing their commitment to PASA and sharing their energy for our future. Thank you!

We are facing a rapidly changing climate and it will take all of us to respond to this new reality. We must hone our production methods, stay current on available research, develop financially viable business models, train the next generation of farmers and land stewards, and calibrate our efforts with our peers. In this report, you will see examples of our commitment to providing research and education, grounded in the evidence-based knowledge of our farmers, in order to create a more economically just, environmentally regenerative and community focused food system. And, given the generosity of our farmers, farmers who share their knowledge and strategies freely, we know we are the type of organization that is well-positioned to be facing both the challenges and potential that awaits those of us trying our best to farm like the future matters.

What are you dreaming and scheming for the coming year? Together, we can achieve so much! If you're not a current member, please join. If you haven't given a financial gift recently, please consider putting your name behind this important work. We can't do what we do without you!

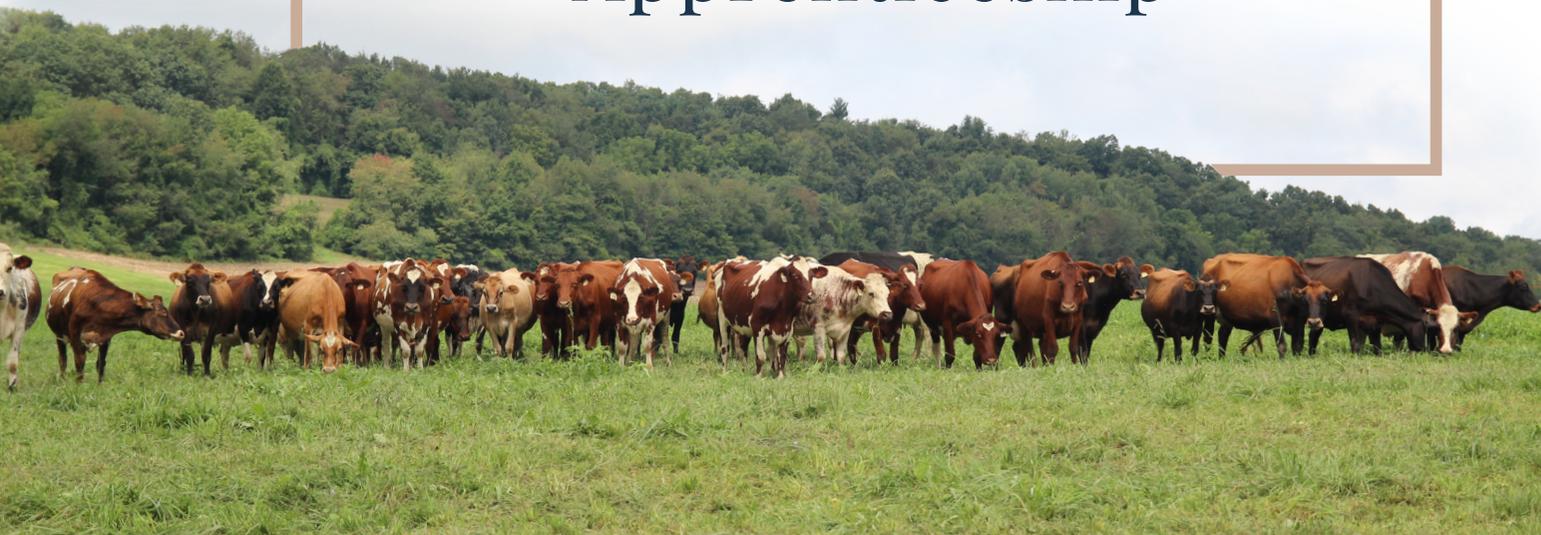
Hannah Smith-Brubaker



The PASA board and staff work hard to deliver the most appropriate, meaningful and sensible services possible. We're passionate about the PASA community and we hope the difference it makes for you is significant.



Aiding a Sector in Crisis with Dairy Grazing Apprenticeship



More than 100 Pennsylvania dairy farms were projected to go out of business in 2018 alone, a continuing trend in a historic downturn in the state's dairy market. How did we get here?

The simple answer is an oversupply of milk. The more complex answer is rooted in a system of production that values milk produced per cow over any other single variable. Over time, this has led to the consolidation of the U.S. dairy industry into fewer and larger farms.

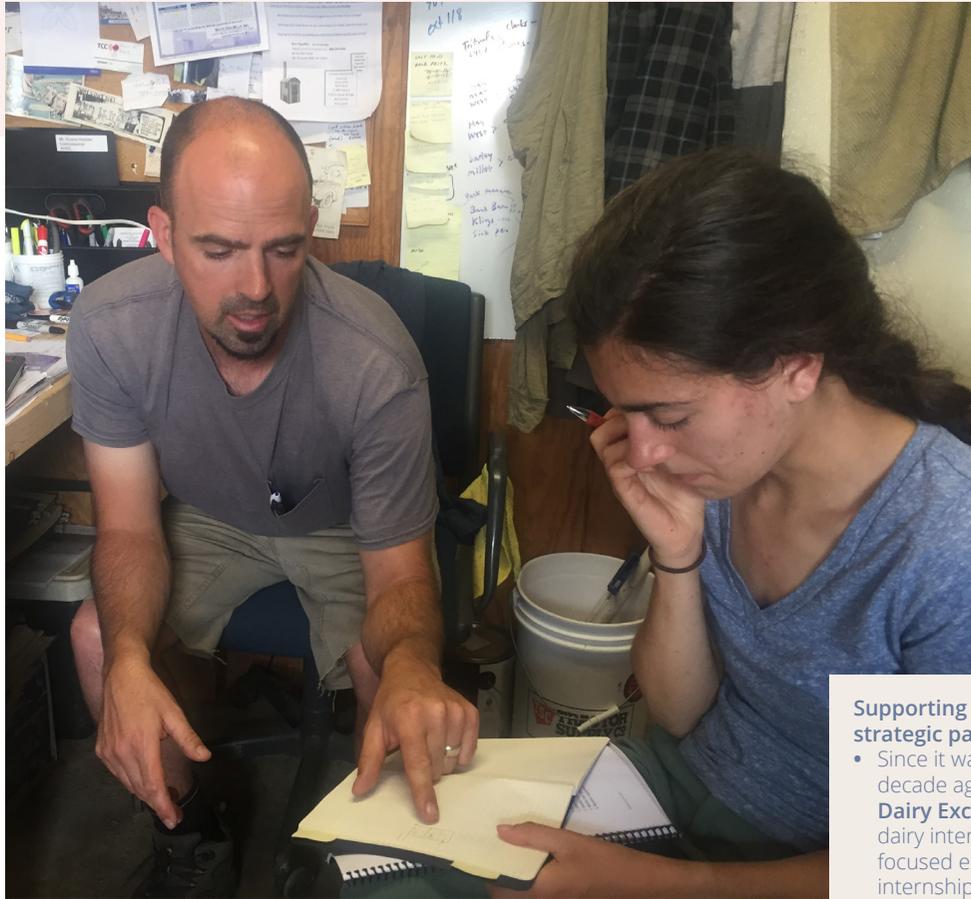
While the dairy industry focus is on maximizing economies of scale, it is often at the expense of environmental health, animal welfare, and smaller dairies that typify Pennsylvania's industry. Pennsylvania is the seventh largest dairy producing state in the country, but has the smallest average dairy size, with an average herd size of 80 cows, something we should work to preserve.

At a time when our state's largest agricultural industry is struggling, through **Dairy Grazing Apprenticeship** we're proud to be working to help train beginning and experienced farmers alike to implement production practices that can lend more financial resilience to small dairies while protecting animal welfare and the natural resources we all depend on.

About Dairy Grazing Apprenticeship

Dairy Grazing Apprenticeship (DGA) is the first formally accredited agricultural apprenticeship program in the United States. The program pairs beginning farmers with mentors—or master graziers—to provide a guided pathway toward independent dairy farm ownership or a career in grazing while strengthening the economic and environmental well-being of rural communities and the dairy industry. PASA administers DGA apprenticeships in Pennsylvania and the surrounding region.

Apprentices receive **3,700+ hours** of paid, on-the-job training and **280+ hours** of related technical coursework over **two years**. Training and coursework cover a comprehensive array of herd and pasture management skills, as well as business management and dairy nutrition.



Master Grazer Niel Hertzler and college intern Kate Sabino discussing forage quality and butterfat content in milk.

Since we began coordinating Dairy Grazing Apprenticeship in 2016, **12 experienced farmers** in our region have become certified master graziers, and **6 beginning farmers** are either actively apprenticing or seeking a suitable host farm. With current funding levels and increased administrative capacity, we're well-positioned to expand the program to accommodate growing numbers of master grazer-apprentice pairs in the year to come.

Apprentice spotlight: Jessica Matthews

This fall, Jessica will be entering her second year of apprenticing with Master Grazer Gay Rodgers at Hameau Farm in Mifflin County, PA. Jessica entered Dairy Grazing Apprenticeship with no previous dairy experience, but now confidently states she wants to work with cows for the rest of her life. As part of her work at Hameau, Jessica is investigating entering raw milk markets and venturing into cheesemaking to diversify the farm's revenue streams.

Apprentice spotlight: Joseph Moyer

Joseph began working with his father, Master Grazer Brian Moyer, at Moyer's Dairy Farm in late 2016, and in that time has gone from possessing almost no operational knowledge of his family's dairy farm to managing the grazing herd and looking toward a future as a grazing dairy farmer.

Dairy Grazing Apprenticeship was founded by dairy farmers in Wisconsin in 2010. PASA coordinates the program in Pennsylvania and surrounding states.

Supporting dairies through strategic partnerships

- Since it was founded over a decade ago, the **Center for Dairy Excellence's** (CDE) college dairy intern program has focused exclusively on providing internship opportunities on confined dairy operations. We worked alongside CDE to introduce its **first grazing dairy** to its list of host farms: Rock Hollow Farm, an organic operation in Perry County, PA owned and managed by Master Grazer Neil Hertzler.
- We collaborated with **Pennsylvania Grazing Lands Coalition** to offer 12 educational and discussion events for dairy graziers across the state. This included the **first regional graziers conference** in Bradford County, PA, which brought together dozens of graziers in the northern tier. More than **300** aspiring, beginning, and experienced dairy graziers attended these events.
- We worked with **Penn State Extension** and **USDA Agricultural Research Service** to analyze grazing dairy profitability and environmental impact by assessing the cash flows of three distinctly different dairy operations. These investigations yielded valuable discoveries—for example, one of our analyses revealed an operation could both meet its production goals and decrease its expenses by reducing its herd size.

Region's First Formal Apprenticeship for Vegetable Growers

We've laid the foundation for a major advancement in available training opportunities for vegetable farmers. Our Diversified Vegetable Apprenticeship (DVA) will be the first accredited apprenticeship for vegetable growers in the mid-Atlantic region, offering aspiring growers paid training and extensive related coursework, while meeting the employment needs of the established farmers who host apprentices.

After developing a comprehensive learning curriculum and setting the administrative structure, we began piloting Diversified Vegetable Apprenticeship at Plowshare Produce, a three-acre, organic CSA farm in Huntingdon County, PA. Owners Bethany and Micah Spicher-Schonberg agreed to pilot the program because they knew "an aspiring vegetable grower would engage in the daily work on a deeper level than someone with just a passing interest." Also, they thought participating in the program would be a reliable way to connect them with a dependable, motivated employee.

We matched Bethany and Micah with aspiring farmer Jess Hermanofski, who they enjoy having working with them because she "really wants to understand why we do things the way we do," and is constantly surprising them as they discover her competencies.

Diversified Vegetable Apprenticeship officially launched in late 2018, when we began accepting applications for the 2019 season.



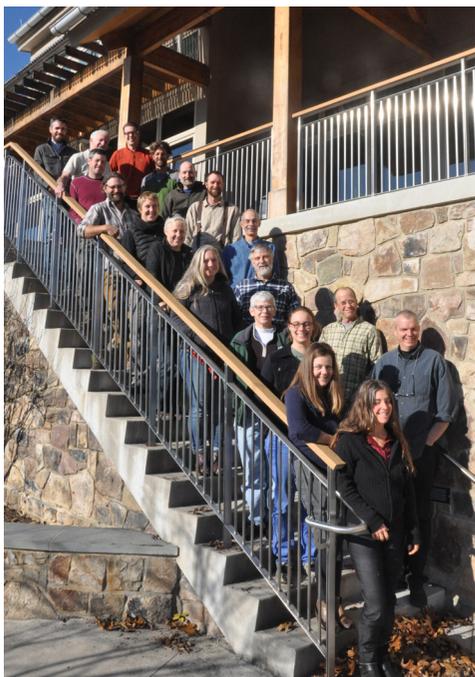
"I really enjoy that every day is different, and that I'm learning something new every day. I enjoy seeing everything come together for the beautiful CSA shares, and the members' reactions when they see their shares. I also love seeing the farm transition from empty beds, to small transplants, to larger plants, and then getting to harvest the beautiful crops, and knowing I helped make that happen!"

*—Apprentice Jess Hermanofski,
Plowshare Produce*



"PASA not only helped us locate an employee; they've been gently guiding us through the season, ensuring that our apprentice receives a well-rounded education."

*—Master Grower Micah Spicher-Schonberg,
Plowshare Produce*



To create the curriculum for Diversified Vegetable Apprenticeship, we worked alongside beginning farmers, experienced farmers, and educators representing 19 of our members' farms to complete a series of curriculum development workshops facilitated by an instructional design expert. Through this process, we identified a set of 15 core competencies vegetable farmers need to operate a successful farm business, from soil fertility and weed control, to business administration and marketing.

“This program is important because finding skilled management is both one of the most pressing issues most regional farmers face, and one of the most important resources in family farms managing transition. The program is working to meet that need, as well as prepare the farm apprentice with the diverse skills and tools they’ll need to be successful.”

—Heidi Witmer, LEAF Project (Perry County, PA) Diversified Vegetable Apprenticeship steering committee participant

COMPREHENSIVE TRAINING

Apprentices receive **2,700+ hours** of on-the-job training and **200+ hours** of related technical coursework over **18 months**.

INVESTED EMPLOYEES

Master growers gain access to a pool of pre-qualified employees who want to farm as a career.

PROGRESSIVE WAGE

Master growers compensate apprentices with scheduled wage increases as they advance their skills.



“Diversified Vegetable Apprenticeship is the best of both worlds because the apprentice gets classroom instruction and real-life experience. The farm that participates in this program also has the potential to hire an experienced worker who has seen literally everything that goes on at that farm. Without an organized program such as this, both the apprentice and the farmer have less of a chance to advance each of their goals.”

—Art King, Harvest Valley Farms (Butler County), Diversified Vegetable Apprenticeship steering committee participant

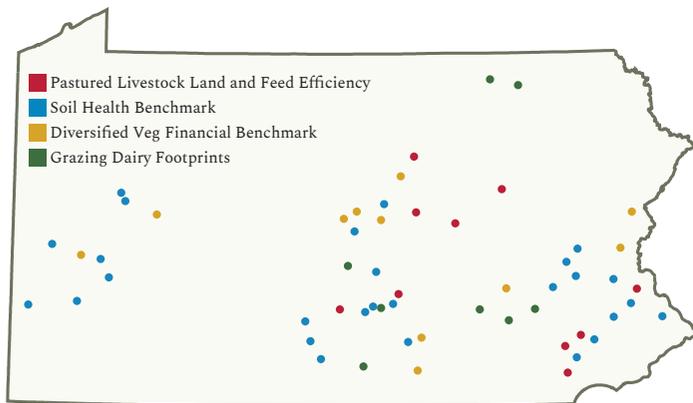


Establishing Sustainability Benchmarks for Data-Driven Decision Making

We're working alongside farmers across Pennsylvania and the surrounding region to produce a set of sustainability benchmarks that provide important insights into how farmers can operate financially viable and environmentally regenerative businesses that contribute to the health of their communities. Having access to a comprehensive set of up-to-date benchmarks lets farmers make informed decisions that can prepare them to confront evolving markets and a changing climate.

We conduct our benchmarking studies on our members' working farms, instead of research plots, which lets us compare a wide range of production and business models in real-world settings.

Together, we are documenting how farmers can forge new frontiers in the art and science of sustainable agriculture.



56 farms across PA, MD and NJ participated in our four benchmarking research projects.

Soil Health Benchmark Study

What soil management methods are effectively building healthy soils?

With our partners at the Cornell Soil Health Lab, and with support from an NRCS Conservation Innovation Grant, we're comparing a cohort of farmers' detailed production records with their soil tests to identify which management strategies are contributing to building healthy soils, and which are inadvertently contributing to soil health challenges.



73 farmers participated in soil health benchmarking groups, where they collaboratively worked to develop management strategies for extending cover crop windows, reducing tillage, and minimizing off-farm fertilizer inputs. We distilled these conversations into three case studies, which we've published on our website and in a leading trade publication.

Improving organic matter levels

4.10% PASA member farms*

2.50% Typical PA Farms**

*Average organic matter levels measured by farms participating in our Soil Health Benchmark Study.

**Average organic matter levels for sampled Pennsylvania soil types, according to NRCS Soil Survey.

Organic matter is a core component of soil health—it helps prevent erosion, increases nutrient cycling, and improves resilience to extreme weather. It also plays an important role in conserving the health of natural resources, such as by filtering agricultural runoff water before it enters waterways.



"We're participating in PASA's Soil Health Benchmark Study and it is truly amazing to see how our soil improves each year. The study connects a network of farms into one detailed analysis that produces a critical mass of information necessary to show that sustainable farming practices do, indeed, enhance the health of our soil."

—Steve Tomlinson, Carversville Farm Foundation, Carversville, PA

Diversified Vegetable Financial Benchmark Study

What makes a vegetable farm financially viable?

Direct-market vegetable sales at farmers markets, CSAs, on-site farm stands, and other outlets are a major industry in Pennsylvania, and direct-market vegetable farmers are the biggest component of our farming membership. Yet, little information is available to guide vegetable farmers in making sound financial decisions.

We're helping vegetable farmers improve their bottom line by comprehensively analyzing vegetable farmers' financial records and business models.

Economic impact of PASA member farms

Indicator	Diversified Vegetable Financial Benchmark Study participants (median)	Estimated regional impact of PASA-member vegetable farms
Gross sales	\$192,765	\$131M
Net farm income	\$49,085	\$37M
Wages and salaries	\$48,199	\$39M

23 farmers in Pennsylvania have completed a comprehensive survey about their business model and finances, adding to a set of data from **46 farms** in Wisconsin and Minnesota collected since 2014.

Record keeping makes a difference. Through our benchmark research, we're finding that by adopting more holistic record keeping systems farmers can elicit significant environmental and financial improvements. Through the FarmOS platform, we're working with a team of software developers and agriculture scientists to create record keeping systems that help farmers fill in the gaps and conduct analyses that will help them make more informed management decisions.

Grazing Dairy Footprint Study

While many grazing dairy farmers believe their methods produce less soil erosion and nutrient runoff than confined dairy herds—while generating better quality milk at lower production costs—it's challenging to develop a holistic account of the environmental and economic footprints of grazing dairies. In 2018, we worked with USDA Agricultural Research Service to assess the footprints of eight grass-based Pennsylvania dairies.

Grazing dairies v. confinement dairies

Indicator	Grazing dairies (median)	Typical confined dairy in PA	% difference
Milk production lbs per cow per year	10,587	19,497	-46
Nitrogen losses lbs per acre per year	72	110	-34
Phosphorus losses lbs per acre per year	0.33	1.2	-73
Fossil energy use MBtu per lbs milk per year	0.94	0.82	+14
Greenhouse gas emissions lbs CO2 equivalents per lbs milk per year	1.23	1.00	+23

Our members who operate meat and dairy livestock farms collectively steward **more than 35,000** acres of deep-rooted perennial pastures in Pennsylvania and surrounding areas.

We've found that grazing dairies essentially eliminate soil erosion and surface phosphorus losses and reduce nitrogen leaching into waterways, more so than in confined operations. Yet, compared to confined operations, grazing dairies produce substantially less milk per cow and per acre, and emit more greenhouse gases per unit of milk. The larger greenhouse gas emissions can be attributed to the fact that cows on grass-based dairies emit substantially more methane.

However, because the current assessment model used by the USDA Agricultural Research Service does not take into account carbon sequestered into the soil—which tends to be substantial on grasslands—we'll be working to add field sampling of soil carbon to our assessments.

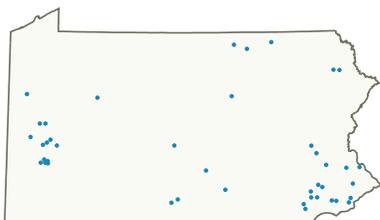
Pastured Livestock Land & Feed Efficiency Study

How much land and feed do farmers need to produce a pound of meat?

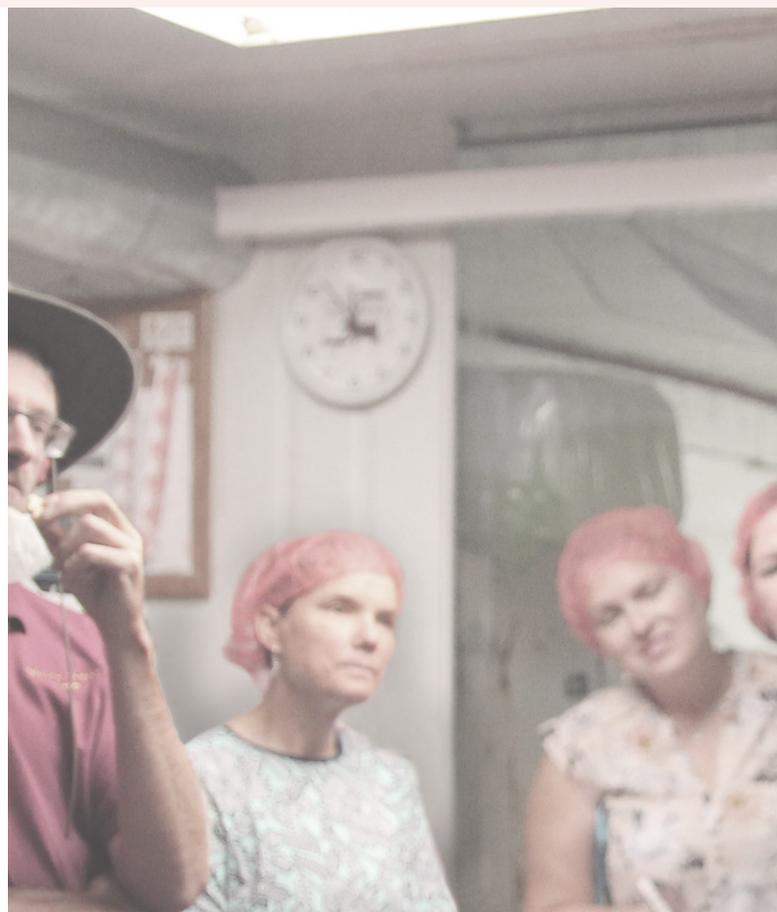
Raising livestock—whether cattle, lamb, pigs, or poultry—on green, perennial pastures can improve soil health, water quality, and animal welfare. But pastured livestock farms have been criticized as being “too inefficient” to become a significant sector of the modern food system. Because land and feed are typically the greatest expenses incurred with pastured livestock operations, we're studying how pastured livestock farmers can more effectively use resources to operate a profitable business.

Our workshops and events bring together farmers from a spectrum of scales, backgrounds and production and business models, to share best practices and experiment with new ideas. They also provide valuable opportunities for educators, researchers, and a wide range of agriculture and food system professionals to connect with farmers and advance shared goals. We collaborate with farmers, educators, researchers, and other food system professionals to offer year-round learning opportunities that take place on working farms across Pennsylvania. Our “classrooms without walls” let farmers walk among the fields of their peers, where they can observe a wide range of production systems tailored to serve hosts’ unique plots of land and business models.

We coordinated 57 educational workshops and events across Pennsylvania, which were attended by nearly 1,000 people. Topics included:



- Advanced Tractor Safety
- Changing Agricultural Practices, Changing Agricultural Policy
- Diversified Vegetable Financial Benchmarks Webinar
- Hands-On Soil Health
- Irrigation Essentials
- Mushroom Primer
- Optimizing Forage for the Grass-Fed Dairy
- Propagating Culinary & Medicinal Herbs
- Winter Apple Pruning & Maintenance for Organic Farms



Leveraging partnerships

Through partnerships and collaborations with a diverse array of working and educational farms, extension offices, and other organizations who share our mission, we’re able to connect with and serve farmers and food system professionals from across the state.

In both Pittsburgh and Philadelphia, PASA has been partnering with organizations such as Grow Pittsburgh, Black Urban Growers (BUGS), PA Womens Agricultural Network (WAgN), and Soil Generation to support urban growers through our CRAFT program.



93

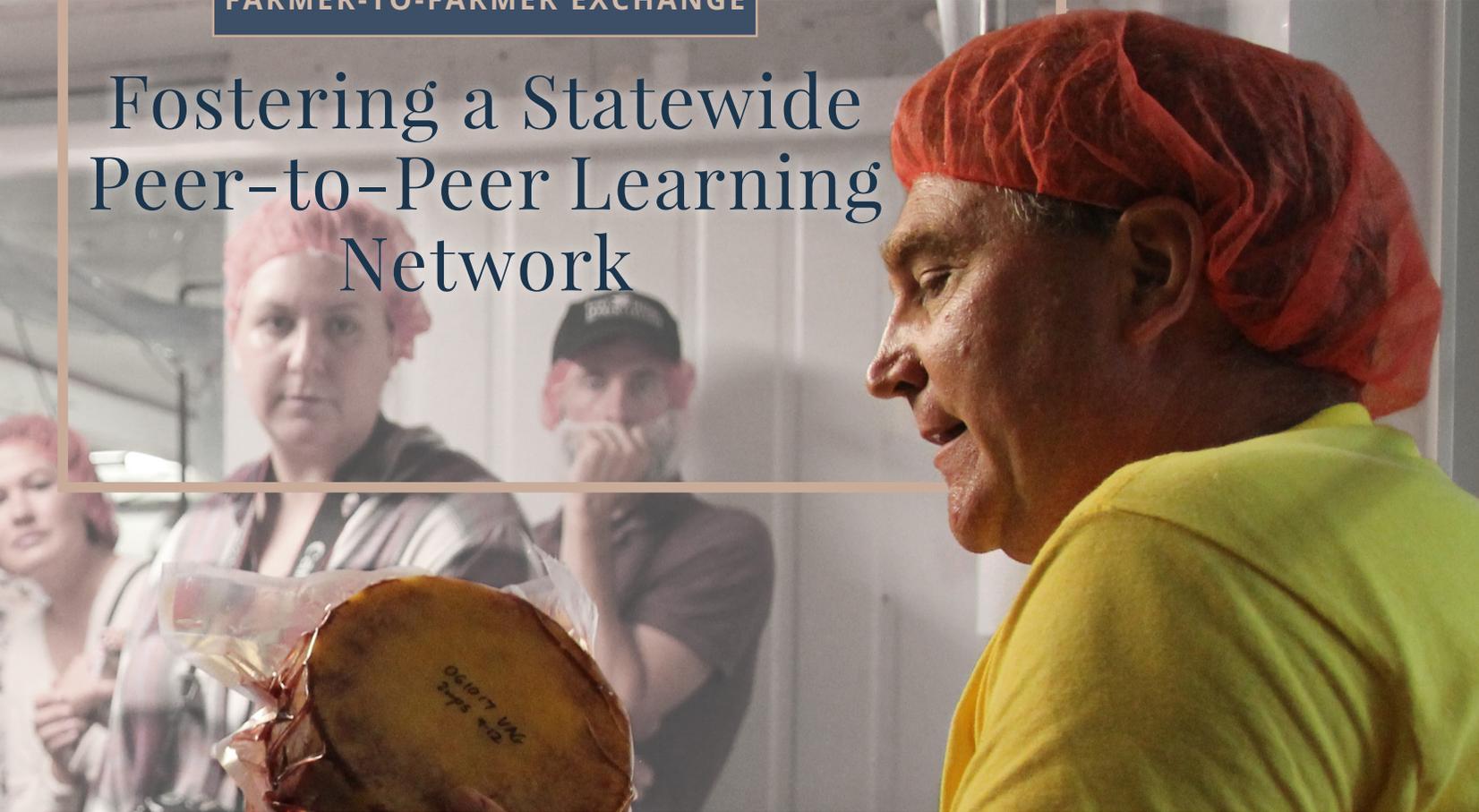
percent of attendees tell us our events help them make new professional and personal connections

Who attends our events?

- 62% farmers
- 23% food system professionals
- 15% homesteaders, gardeners, and other sustainable food system supporters

FARMER-TO-FARMER EXCHANGE

Fostering a Statewide Peer-to-Peer Learning Network



Event host spotlight:

Our Soil Health Conference at Spiral Path Farm in Perry County was a great success. Farmers Mike and Will Brownback shared their farm and the results from their PASA soil health assessment. Through forty years of farming organically, the Brownbacks have boosted their soil organic matter to impressive levels; in one field, we measured 5.1% soil organic matter, on a soil type that typically holds only 1.5%.



94

percent of attendees report they are likely or somewhat likely to implement a new skill or practice they learned



45

percent increase in knowledge on event topics and concepts reported by attendees

ANNUAL CONFERENCE

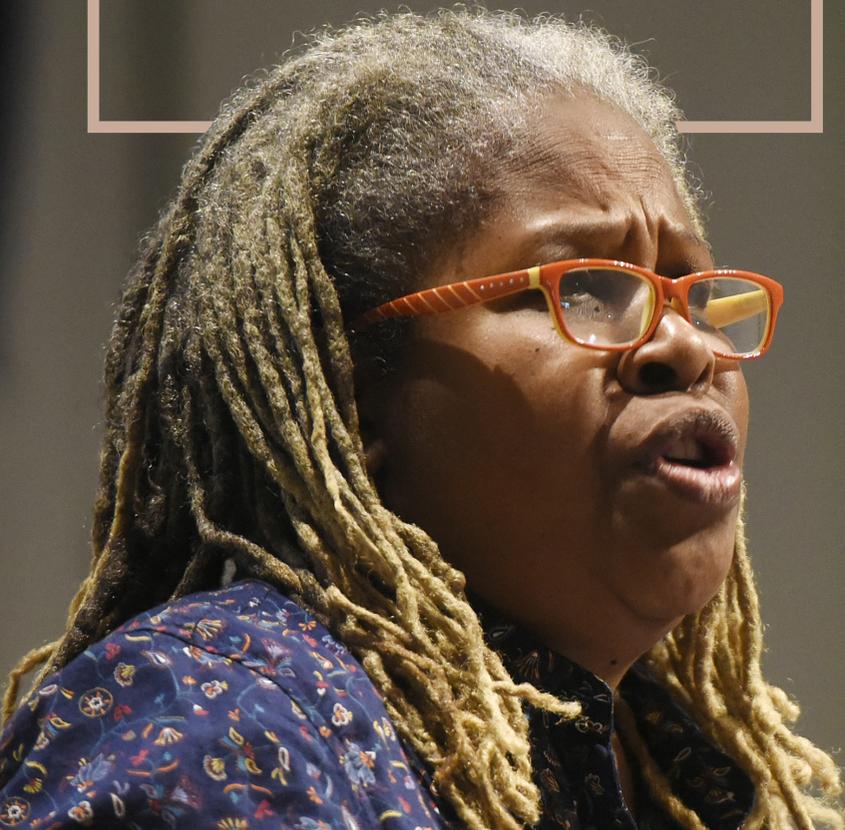
Sustainable Agriculture Education in a Changing Climate

As global temperatures continue to climb, we are facing more frequent extreme weather events, such as prolonged droughts, flash rains, and intense storms, that can threaten farmers' livelihoods and impact the food supply. Farmers are also encountering new patterns of pests and disease as our ecosystems fluctuate more rapidly than before.

The fact is, we're in a new climate reality. Farmers must respond swiftly to adapt as best they can while they simultaneously work to impede its risks by developing a resilient, locally-based food system with regenerative agriculture at its core.

Our **annual conference**, now entering its 28th year, is our region's hallmark sustainable agriculture educational event, bringing together thousands of farmers, educators, researchers, homesteaders, and food system advocates for four days of intensive learning on topics such as vegetable and fruit production techniques, pastured livestock management, business planning, and natural resource conservation.

Our conference serves as a cornerstone to navigating our future. We know we cannot simply think our way through change; we have to live it, and it will take all of us to grow together in order to create the better tomorrow we know is possible.





Educational programming

- 4 full-day intensives
- 16 half-day sessions
- 97 workshops

Profile of conference attendees

1,350+ attendees from across the country and around the world
 84% grow or raise agricultural products in some way

44% are current farmers

29% are food system professionals

27% are sustainable agriculture supporters

31% of attendees who are not current farmers plan to start farming within three years
 54% are women

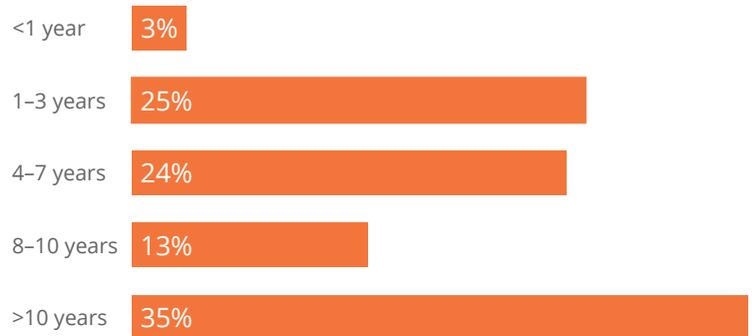
88% of attendees stated they are likely or somewhat likely to implement a new skill or practice

55% increase in knowledge reported by attendees

“This conference energized me for the growing season ahead and made me feel a part of something extraordinary.”—Anonymous attendee feedback

Number of years farming

Whether farmers are in the beginning stages of their careers, have decades of experience, or fall somewhere in between, our conference offers programming that meets farmers where they are now.



We fully or partially covered conference registration costs for **131 people** thanks to financial support from grants, donors, memorial funds, and sponsorships, as well as workshare arrangements.

*“Everything we have learned about caring for our orchard came in one form or another from attending the annual conferences held by PASA.”
 —David & Heather Loomis, Bohlayer’s Orchards, Troy, PA*

After generations of growing their fruit using conventional methods, Bohlayer’s became the first Certified Naturally Grown orchard in the mid-Atlantic region in 2016.

MEMBERS & SUPPORTERS

Our Network at a Glance



For nearly 30 years, we've worked to foster productive connections between farmers, community members, local businesses, policymakers, and other stakeholders. The long-term impact of these connections has helped make Pennsylvania a leader in sustainable and local food systems.

In 2018, Pennsylvania surpassed Washington to become a leading state in organic sales, second only to California. Pennsylvania is also the number one state in the nation in direct-to-consumer sales from farms, and is a national leader in crop diversity and using cover crops to improve soil health.



Our farmer members represent a wide range of production scales:

INDICATOR	TOTAL ACRES	PRODUCTION ACRES
AVERAGE	115	95
MIN	0.25	0.01
MAX	5000	4000
MEDIAN	40	20

Collectively, our members steward nearly **80,000 acres** of land.



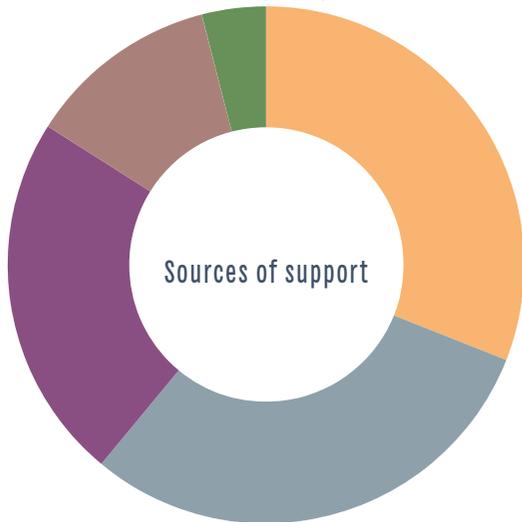
Over **6,000** members and supporters

Our member network includes not only farmers, but also food system professionals—such as food entrepreneurs, educators, researchers, agricultural supply companies, and nonprofit organizations—as well as community members who support advancing sustainable agriculture.

Our farmer members grow a wide range of products. While **mixed vegetables** and **pastured meat animals** are the most common enterprises, our members are also producing tree fruit and berries, hay, grains, and forage crops, eggs, milk, mushrooms, herbs, cheese, ornamentals, and more!

Fiscal Year 2018 Financials

Total \$1,416,593



Awards & Grants
31%

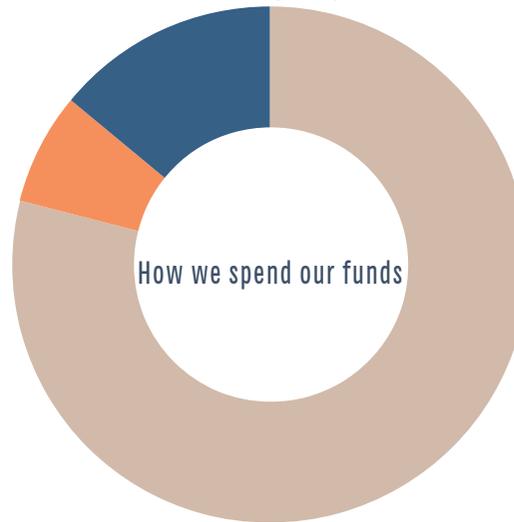
Private Contributions
30%

Events
23%

Sponsorships
12%

Dues
4%

Total \$1,266,103



Programs & Services
79%

General & Admin
7%

Development
14%

Our members and supporters provide the financial footing for our work. 79% of revenue is directed to programs that support our work directly: our Benchmark Research Studies, our Apprenticeship Programs, our Peer Learning Network, and our Sustainable Agriculture Conference. The remaining 21% provides general and administrative services as well as fundraising to ensure we can continue to provide meaningful services and support.

In February of 2018, we met *and surpassed* a \$3M goal to raise funds to support our work through the Building the Soil Campaign. The 121 donors ranged from farms and families, to businesses, corporations, foundations, and granting agencies. We express deep gratitude to our investors in this work – as their commitment to ensuring the longevity of sustainable farming is undeniable. These supporters exemplify the type of commitment, passion and willing investment that is required to sustain this program.

Building the Soil Campaign



We've achieved a GuideStar Gold Seal of Transparency.

GuideStar is the world's largest source of information on nonprofit organizations. Visit guidestar.org to find detailed information about our goals, strategies, capabilities, and financials.

Board

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 Heidi Secord · Jennifer Brodsky · Jessie Smith, at large · John Good
 Mike Brownback · Nathan Holmes

Staff

Aaron deLong · Christina Kostelecky · Clay Chiles · Dan Dalton
 Franklin Egan · Jennifer Himes · Kristin Hoy · Lauren Smith
 Melissa Cipollone · Sarah Bay Nawa

Hannah Smith-Brubaker, Executive Director

The total revenue raised of **\$3,023,334** represents \$1,161,367 from foundations and granting agencies, and \$1,861,967 from businesses and individuals.



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