

**Northern Shenandoah Valley**  
**2023 Annual Report**

**Virginia Cooperative Extension**

*Clarke County*

*Frederick County*

*Page County*

*Shenandoah County*

*Warren County*

# Noteworthy Metrics for 2023 Programming



653 youth and adults certified, recertified, or credentialed for workforce professional development and through workplace readiness programs\*



\$1,270,945 value of volunteer time contributed\*



982,032 virtual educational contacts\*



824 volunteers\*



3,149 youth enrolled in 4-H\*



12,203 face-to-face youth educational contacts\*



35,055 of face-to-face adult educational contacts\*

\*compiles figures from all Northern Shenandoah Valley VCE staff (figures based on calendar year)



**Virginia Cooperative Extension**  
Virginia Tech • Virginia State University

# Table of Contents

## At a Glance:

Noteworthy Metrics for 2023 Programming.....	2
Virginia Cooperative Extension – Clarke County.....	4
Virginia Cooperative Extension – Frederick County (Winchester City).....	6
Virginia Cooperative Extension – Page County.....	8
Virginia Cooperative Extension – Shenandoah County.....	10
Virginia Cooperative Extension – Warren County.....	12
Virginia Cooperative Extension: Advancing Wellbeing of All Virginians.....	14
Virginia Tech – Alson H. Smith, Jr. AREC.....	16
Northern Virginia 4-H Educational Center.....	18

## Several 2023 Program Impacts:

Developing Leadership & Citizenship Skills Through the County 4-H Council & County 4-H Honor Club.....	20
Family and Consumer Sciences SNAP-Ed Programming.....	21
4-H Youth Explore the World Through International Travel.....	22
4-H Conservation Awareness Day Cultivates Middle School Students into Environmental Advocates, Inspiring the Next Generation Through Conservation Education.....	23
4-H Nurtures Leadership and Community Impact in Local Teens by Creating Opportunities to Empower Teens to Become Tomorrow’s Leaders.....	24
Management of Livestock Mortality in Catastrophic Situations.....	25
4-H Embryology in the Classroom Transforms Elementary Education by Fostering Scientific Inquiry Through Hands-On Science Education & Responsible Citizenship.....	26
Northern Shenandoah Valley Drinking Water Testing Program Fields Positive Results.....	27
Tree Fruit Extension Program.....	28
Northern Shenandoah Valley Pesticide Safety Education Program.....	29
Strengthening Agricultural Viability in Page County & the Northern Shenandoah Valley.....	30
Promoting Agriculture, Natural Resources, and Environmental Literacy in Page County Youth & Adults....	31
Consumer Horticulture and Environmental Programming in the Northern Shenandoah Valley.....	32
The Pandemic Drives Thriving Northern Shenandoah Valley Extension Master Gardener Seed Lending Libraries.....	33
5-Year Impact Virginia Cooperative Extension Northern Shenandoah Valley Master Gardeners.....	34
Northern Shenandoah Valley Poverty Simulations Help Participants Better Understand Families Who are Struggling Financially.....	35
Meet the Staff Serving the Northern Shenandoah Valley.....	36



## Community Voices

“My experience with Clarke/Warren 4-H Camp not only instilled outdoor survival skills, but it also taught me profound social and life skills, which are important tools. The memories I made will be with me forever, and the friendships I have made are lifelong and important to me.”



**Lily Carlisle**  
4-H Camp Teen Counselor

# 147

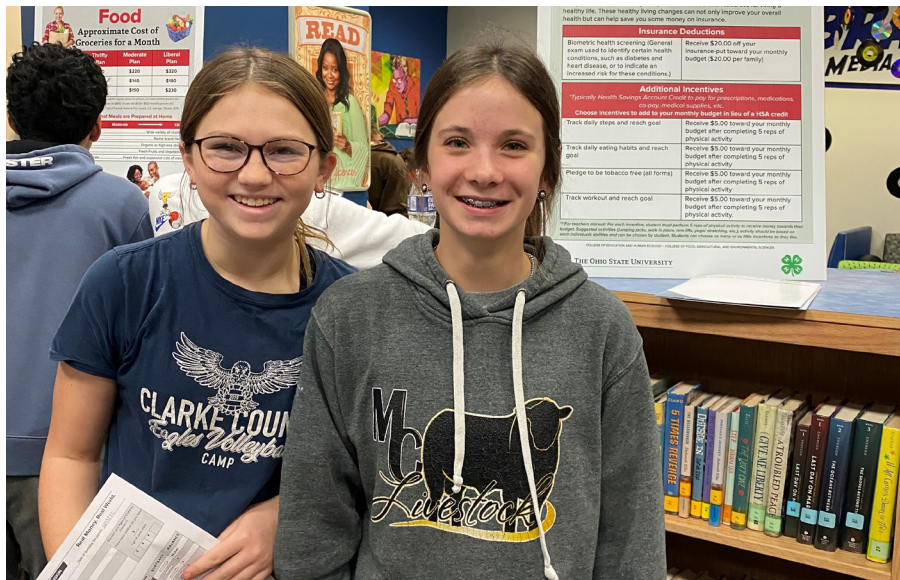
## Livestock 4-H Projects Shown at Fair

## Partners for Solutions

“Over the past five years, 174 Extension Master Gardeners serving the Northern Shenandoah Valley (Clarke, Frederick, Page, Shenandoah, Warren, and Winchester) logged 72,381 volunteer hours and reached 1,431,118 educational contacts. These numbers speak volumes, but it is really about the changed lives, improved environment, and healthy communities that these numbers represent.”



**Mark Sutphin**  
Agent



Eighth graders at Johnson-Williams Middle School.

## Sharing Knowledge

Johnson-Williams Middle School’s eighth grade students got a firsthand look at the cost of daily life during our Real Money, Real World simulation. Using a scenario describing their occupation, income, and family situation, 146 students visited booths representing the spending categories in a household budget to see if they could make ends meet. Afterward, 96% said they planned to think through how their spending impacts other opportunities when making future financial decisions, and 74% said they intended to get more training or education after high school. Through experiential learning, students gained insights such as, “You have to think things through before buying something,” and “I will make sure that I find a high-paying job so I can afford important things.”

# Clarke County

## Funding by Source



**59% State**

**31% Local**

**10% Federal**

**Total Funding: \$196,347**

**\$2.27**

return on investment  
for every dollar  
invested by the county  
in **Clarke County**

**\$45,707**

value of extension  
volunteer hours in  
**Clarke County**

To find out how you can support your local Extension office,  
**visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).**

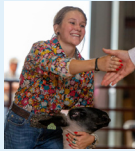
# Frederick County

107 N. Kent Street  
Winchester, VA 22601  
frederick.ext.vt.edu  
540-665-5699



## Community Voices

"I gained the knowledge to turn an average sheep into a champion with hard work. My participation in 4-H not only allows me to learn the spirit of service and giving back, but it has also given me the ability to teach younger kids to take leadership skills back to our community."



**Kennah Kerns**  
4-H Livestock Club Member

# 295,558

**NSV Master Gardeners' social media reach**

## Partners for Solutions

"Extension's Graze 300 VA and no-till initiatives are top priorities because they impact over 200,000 Northern Valley acres that are managed by 1,400 farmers and owned by nearly 5,000 families. These programs enable farmers to maintain profitability while improving soil health, protecting water quality, preserving groundwater resources, and enhancing wildlife habitat."



**Bobby Clark**  
Senior Extension Agent



Karen Poff, Extension Agent, teaches a lesson on understanding credit scores.

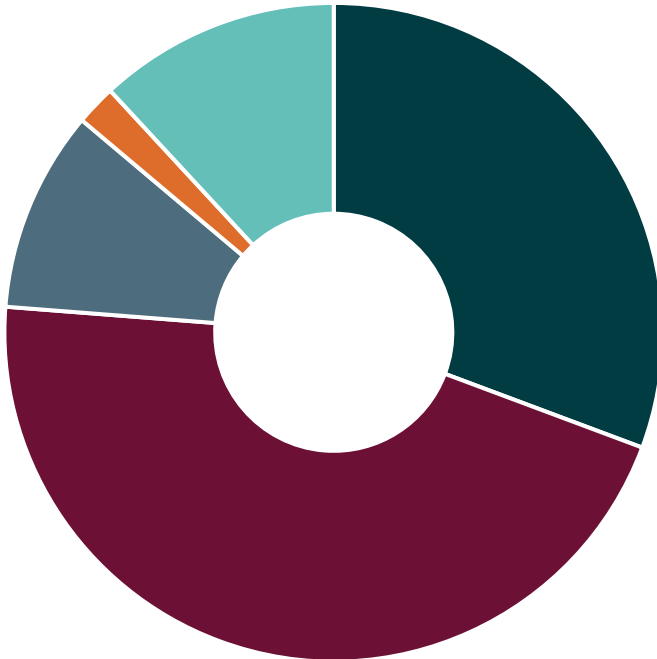
## Sharing Knowledge

People who manage money well are better able to avoid financial problems, maintain stable housing, and remain self-sufficient. Our Managing Your Money series improves financial well-being by helping people achieve goals such as reducing debt, buying a home, paying for college, or saving for retirement. Participants learn proven ways to take control of their finances through sessions on budgeting, credit, banking, insurance, and getting out of debt.

Since 2011, 618 people have participated in the program. Many develop written spending plans, increase savings, and pay down debt. In a recent five-year period, 58 people put a total of \$68,645 into savings and paid off \$43,130 of consumer debt. That averages to \$1,927 in savings or debt reduction per person within just three months of completing the program.

# Frederick County

## Funding by Source



**31% State**

**46% Local**

**10% Federal**

**2% Grants**

**12% Other**

**Total Funding: \$664,794**

**\$1.19**

return on investment  
for every dollar  
invested by the county  
in **Frederick County**

**\$714,960**

value of extension  
volunteer hours in  
**Frederick County**

To find out how you can support your local Extension office,  
visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).

## Community Voices

“Grafting fruit trees is an essential skill for home and commercial orchardists alike. Attending the grafting workshop was not only fun, but it also offered practical experience that will help us to establish and maintain our apple orchard. The folks at the Page County Extension Office are invaluable resources to our community!”

**Susan Kile**

Page County Orchardist and Program Participant

# 346

Soil samples completed

## Partners for Solutions

“By hosting a drinking water clinic, I was able to help 56 families ensure they have safe drinking water. It is very rewarding to give participants peace of mind or help them find solutions for problems that were discovered.”



**Elizabeth Baldwin**

Agent



4-H agent Meagan Dyer assists local high school students at the Reality Store financial simulation.

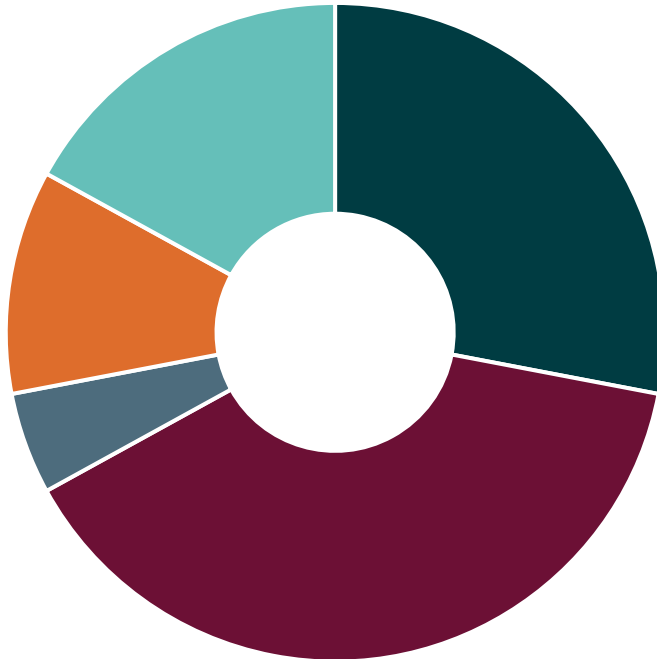
## Sharing Knowledge

As youth prepare to enter adulthood, it’s important for them to understand budgeting, debt, and savings. The Reality Store financial simulation was held for 11th graders at Page High School and Luray High School to give them an opportunity to explore financial planning, goal-setting, decision-making, and career planning.

Students received a hypothetical family situation. Based on that information, students made spending decisions for their household. More than 30 community members and organizations engaged with 258 students. After the simulation, 93% of students said their participation in Reality Store provided them an increased awareness of making smart financial decisions. One teacher reported the simulation made such an impact on students that “We talked the rest of the day about what they learned and what they want/need to learn.”



## Funding by Source



**28% State**

**39% Local**

**5% Federal**

**11% Grants**

**17% Other**

**Total Funding: \$325,618**

**\$1.57**

return on investment  
for every dollar  
invested by the county  
in **Page County**

**\$133,672**

value of extension  
volunteer hours in  
**Page County**

To find out how you can support your local Extension office,  
**visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).**

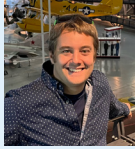
# Shenandoah County

600 N. Main Street, Suite 100  
Woodstock, VA 22664  
shenandoah.ext.vt.edu  
540-459-6140



## Community Voices

“I have to give Extension a huge thank you for doing these classes. I really enjoyed it, learned a lot, and have told many friends and colleagues about this class. All is great: I bought a house and am still using what you taught me to this day!”



### Kai Gingerich

Participant, Managing Your Money Series

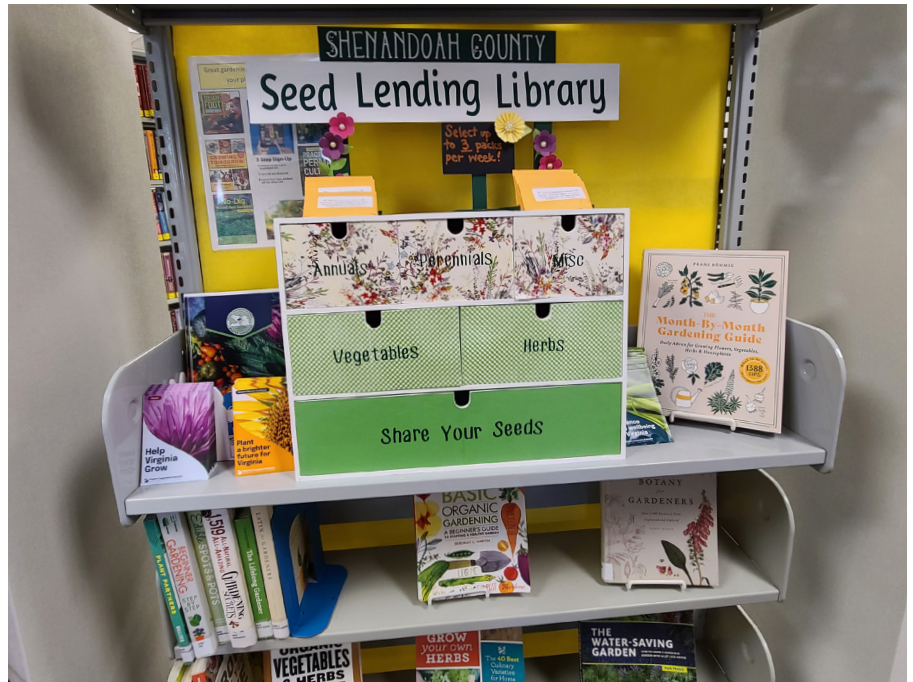
## Partners for Solutions

“SNAP-Ed agent programming focuses on nutrition, physical activity, and healthy food access for families with limited resources. We form partnerships with eligible schools, farmers markets, food pantries, community gardens, and food retail stores. Our goal is to help make the healthy choice the easy choice for families within their communities.”



### Kelsey Kline

Agent



A seed lending display at the Shenandoah County Library.

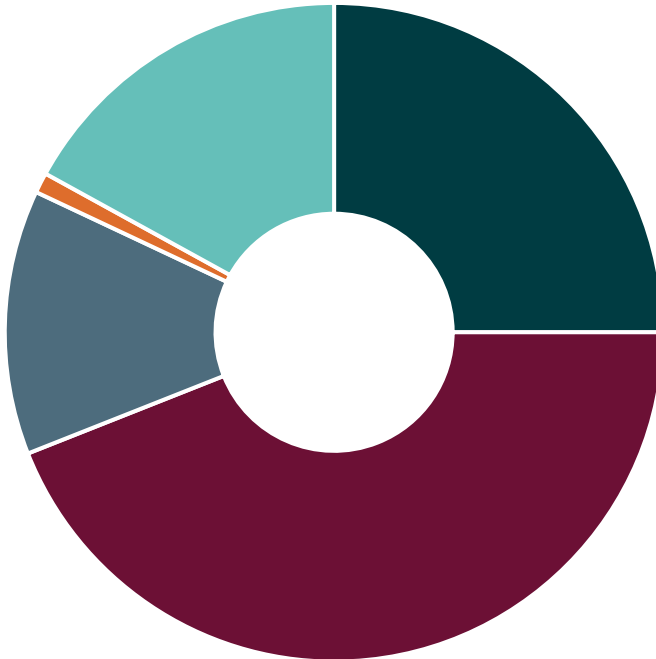
## Sharing Knowledge

During the pandemic, interest in gardening soared internationally. The increased interest, along with supply chain disruptions, led to nationwide seed shortages. Extension Master Gardener volunteers organized year-round seed lending libraries at six Northern Shenandoah Valley community libraries. Master Gardeners held virtual lessons to train one another about seed-saving techniques to provide seeds to these libraries. In 2022, volunteers contributed 142 hours saving, sorting, packaging, and distributing seeds. Additionally, Master Gardeners offered lectures at libraries instructing community members on gardening and seed-saving practices.

Three hundred eighty-eight area residents took advantage of the seed lending libraries, and more than 5,000 seed packets were distributed. In 2023, the lending libraries continue, providing community members with ornamental, herb, and vegetable seeds along with the empowering opportunity to grow their own fresh produce.

# Shenandoah County

## Funding by Source



**25% State**

**44% Local**

**13% Federal**

**1% Grants**

**17% Other**

**Total Funding: \$472,917**

**\$1.25**

return on investment  
for every dollar  
invested by the county  
in **Shenandoah County**

**\$105,829**

value of extension  
volunteer hours in  
**Shenandoah County**

To find out how you can support your local Extension office,  
**visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).**

# Warren County

220 N. Commerce Avenue  
Suite 500  
Front Royal, VA 22630  
warren.ext.vt.edu  
540-635-4549



## Community Voices

“I’ve taken the Managing Your Money course, and it’s wonderfully informative. It helps you see it’s not about how much income you have, but living within your means. After the classes are done, it’s a very empowering feeling because you realize you can do this.”

**Debbie Young**

Participant, Managing Your Money

# 53%

of program participants planned to improve their management protocols

## Partners for Solutions

“4-H Camp is a fun opportunity for youth to learn skills through hands-on experiences. The camping program helps youth build self-esteem and challenges them to be innovative and creative.”



**Stacy Swain**

Former 4-H Educator



Extension agents respond to questions during the Inquisitive Shepherd series.

## Sharing Knowledge

The success of the increasing number of hobby, niche, and homesteading operations in Warren County and surrounding areas adds value to the economy for both the county and the Northern Shenandoah Valley region. Many of these new producers are from urban areas and need training, not only to successfully raise sheep and goats, but also to market them effectively. The virtual nine-session Inquisitive Shepherd Small Ruminant Management Program provided the knowledge they needed and empowered them to build coalitions and develop marketing channels. The 433 people who participated represented 35 states and nine countries. All of the participants who responded to the evaluation reported increased knowledge of small ruminant management, and 53% planned to incorporate one or more changes to their management protocols.

# Warren County

## Funding by Source



**43% State**

**27% Local**

**13% Federal**

**18% Other**

**Total Funding: \$466,578**

**\$2.76**

return on investment  
for every dollar  
invested by the county  
in **Warren County**

**\$49,157**

value of extension  
volunteer hours in  
**Warren County**

To find out how you can support your local Extension office,  
**visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).**

# VIRGINIA COOPERATIVE EXTENSION

## Advancing Wellbeing of All Virginians

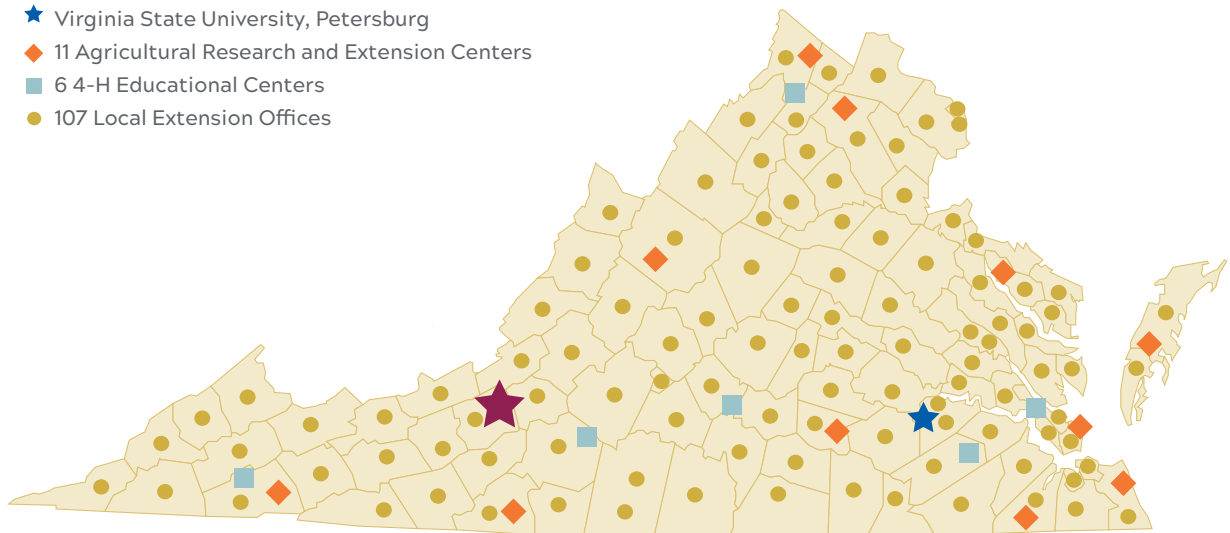
At Virginia Cooperative Extension, we take concrete action that advances the wellbeing of all Virginians. Whether we're building a more resilient food system, supporting local economies, or mentoring youth, we help manage our natural resources, bridge access to knowledge, and shape a brighter future for our communities.

**Extension faculty and staff come from a variety of backgrounds which helps us better understand the distinct needs of all Virginians. It is through this lens that we can accurately and effectively assess, prioritize, and respond to local and state needs.**

Health and wellbeing  
Children and youth  
Safe and stable food supply  
Strong families  
Resilient communities  
Environmental health

Virginia Cooperative Extension has an existing network of facilities (107 city and county unit offices, 11 Agricultural Research and Extension Centers, six 4-H centers and two university campuses and satellites), professional extension staff, and university specialists to deliver vital educational programs to the public. This network is enhanced by a connection to the resources of the land grant universities across the nation and is already located in every county and major city in the state.

- ★ Virginia Tech, Blacksburg Campus
- ★ Virginia State University, Petersburg
- ◆ 11 Agricultural Research and Extension Centers
- 6 4-H Educational Centers
- 107 Local Extension Offices



# VIRGINIA COOPERATIVE EXTENSION

## Addressing the needs that you care about in your community

### STRENGTHENING FAMILIES

Extension offers local programs that ensure that families have the skills and opportunities they need to manage their money, and develop strong family relationships to ensure secure and healthy families.

- Financial literacy and financial education
- Human development programming
- Caregiving across the lifespan
- Mental Wellbeing

### YOUTH

As the youth development arm of Virginia Cooperative Extension, Virginia 4-H works throughout the commonwealth to help all youth learn by doing to help them become the best versions of themselves. 4-H youth are empowered to be upstanding citizens who are actively engaged in their communities and around the world.

- Helps youth become leaders in their communities
- Helps youth make healthy decisions and lifestyle choices
- Agriculture programs equip youth to feed the future
- Emphasizes the importance of STEM through hands-on projects

### COMMUNITY

Virginia Cooperative Extension works on the big issues, partnering with governments and organizations to solve systemic challenges in a way that benefits all Virginians. The commonwealth counts on us for their immediate land, health, and community needs to fix problems as they arise or seize opportunities.

- Addresses critical local needs
- Promotes economic prosperity
- Fosters justice, equity, and respect for all

### FOOD

Virginia Cooperative Extension programming results in safer food from farm to table, increased compliance with food regulations, and more markets available to producers.

- Community, local, and regional food systems
- Food safety, food preservation, and food-based businesses
- Master Food Volunteers

### ECONOMY

Virginia Cooperative Extension programming supports the sustainability and profitability of the Commonwealth's agriculture and forestry industries, Virginia's number one economic drivers that in turn support our communities and provide us with food.

- Agribusiness management and economics
- Agronomy and horticulture expertise
- Animal production and value-added marketing
- Emerging pests and pesticide management
- Natural resources management

### HEALTH

Extension is an integral part of helping Virginians follow a healthy lifestyle and learn how to prevent chronic diseases. Extension empowers people to make healthy choices so they can prevent, delay, and manage chronic diseases.

- Nutrition and Fitness
- Chronic disease prevention
- Substance misuse and abuse

# ALSON H. SMITH JR.

Agricultural Research and Extension Center



As part of its contributions to the commercial fruit industry, the Alson H. Smith Jr. Agricultural Research and Extension Center is a collaborator on a \$475,000 grant from the USDA's National Institute of Food and Agriculture's Agriculture and Food Research Initiative to utilize canines to combat the invasive spotted lanternfly. Mizuho Nita, an assistant professor of plant pathology, operates a grape disease management and Extension lab at the Alson H. Smith Jr. AREC, and he works closely on the project by sending egg samples to Texas Tech University's Canine Olfaction Research and Education Laboratory to conduct multiple behavioral and olfactory research studies.

A benefit of this program is to preserve the quality of grapes and the wines they produce by reducing the need to overuse insecticides to stop the spotted lanternfly. The Alson H. Smith Jr. AREC Center examined the efficacy of detection dogs to locate invasive insects and diseases in vineyards. Dogs identified spotted lantern fly eggs with 95 percent accuracy and hopes to use detector dogs to scout for spotted lanternfly eggs on shipments entering areas without established populations of this invasive insect. As the dogs become more adept, they will be challenged to detect additional harmful predators, such as powdery mildew.

Mizuho Nita, assistant professor of plant pathology (grapes and viticulture), works in the vineyard at the Alson H. Smith Jr. Agricultural Research and Extension Center in Winchester.

## PARTNER WITH US

595 Laurel Grove Road  
Winchester, Virginia  
(540) 869-2560  
<https://www.arec.vaes.vt.edu/arec/alson-h-smith>



"My lab works on integrated approaches to improve grape disease management, including the evaluation of a novel biological control agent against grapevine crown gall, which causes significant economic losses among growers in Virginia and around the world. As part of the SmartFarm Innovation Network and Center for Advanced Innovation in Agriculture, we launched two projects with a Virginia-based startup company, Agrology. Together, we are investigating the use of environmental sensor networks, near-infrared sensor images from an aerial drone, and machine learning models to develop precise disease management strategies."



**MIZUHO NITA**  
ASSOCIATE PROFESSOR, GRAPE PATHOLOGY EXTENSION SPECIALIST

"Dr. Sherif has taken the needs of our Virginia growers to heart and is doing the work required to keep Virginia growers competitive in a complex marketplace. As a grower and consultant working with growers throughout the Mid-Atlantic, I am excited about what Dr. Sherif is bringing to the table. We will all benefit from it."



**BILL MACKINTOSH**  
MACKINTOSH FRUIT FARM



# ALSON H. SMITH JR. AREC AT A GLANCE



## DISCIPLINES

- Tree fruit entomology
- Tree fruit and specialty crop horticulture
- Tree fruit and specialty crop pathology
- Grape pathology
- Viticulture

## INNOVATIVE TECHNOLOGIES

- Membrane-based grapevine virus sampling kit
- Molecular tools to detect and identify major grape pathogens
- Marker-Assisted Breeding (MAB) of apple
- CRISPR/Cas9-mediated gene editing of apple
- Weather-based prediction models for managing crop load in apple
- Partial canopy rain shelters for grapevine
- Novel fungicide chemistry for grape disease management

## FACILITIES

- 124 acres on the farm with over 40 field plots
- 6 modern labs
- 24,500 square foot complex
- 100 person auditorium

## INDUSTRY PARTNERS

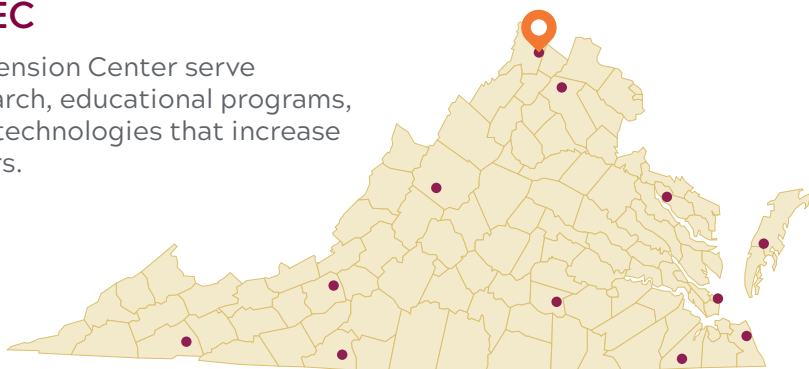
- Virginia Agribusiness Council
- Wine Industry
- Apple Industry
- Virginia Department of Agriculture and Consumer Services

## ABOUT THE ALSON H. SMITH JR. AREC

The Alson H. Smith Jr. Agricultural Research and Extension Center serve Virginia's horticultural fruit industries through research, educational programs, student training, and the development of tools and technologies that increase sustainability and resiliency of commercial producers.

## A COLLABORATIVE NETWORK

The ARECs are a network of 11 centers strategically located throughout the state that emphasize close working relationships between Virginia Agricultural Experiment Station, Virginia Cooperative Extension, and the industries they work with. The mission of the system is to engage in innovative, leading-edge research to discover new scientific knowledge and create and disseminate science-based applications that ensure the wise use of agricultural, natural, and community resources while enhancing quality of life.



Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and local governments. Its programs and employment are open to all, regardless of age, color, disability, sex (including pregnancy), gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, military status, or any other basis protected by law.



VIRGINIA AGRICULTURAL  
EXPERIMENT STATION  
VIRGINIA TECH.



# Northern Virginia 4-H Educational and Conference Center

600 4H Center Drive  
Front Royal, VA 22630  
www.nova4h.com  
540-635-7171



## Community Voices

“Rappahannock County High School alumna and NOVA 4-H Center program director Tatyana Yates spearheads the Health Rocks! initiative for high school junior and senior peer mentors who aid eighth graders’ transition to high school. Our students admire Tatyana, finding her an excellent role model, and thoroughly enjoy the learning opportunities and support she provides.”



### Jenny Kapsa

Coordinator, Family Financial Education and Profile of a Graduate Program, Rappahannock County Public Schools



David and Danielle (founders of AT Kids) atop the summit at Old Rag Mountain

# 2,739

Number of youth  
empowered through  
camp/programs

## Partners for Solutions

“As a member of the Warren County Rotary Club and Chair of its Scholarship Committee, I have the opportunity to help raise funds for local youth who wish to pursue post-high school education. We will award five \$3,000 scholarships to deserving youth this year!”



**Katie Tennant**  
Director

## Sharing Knowledge

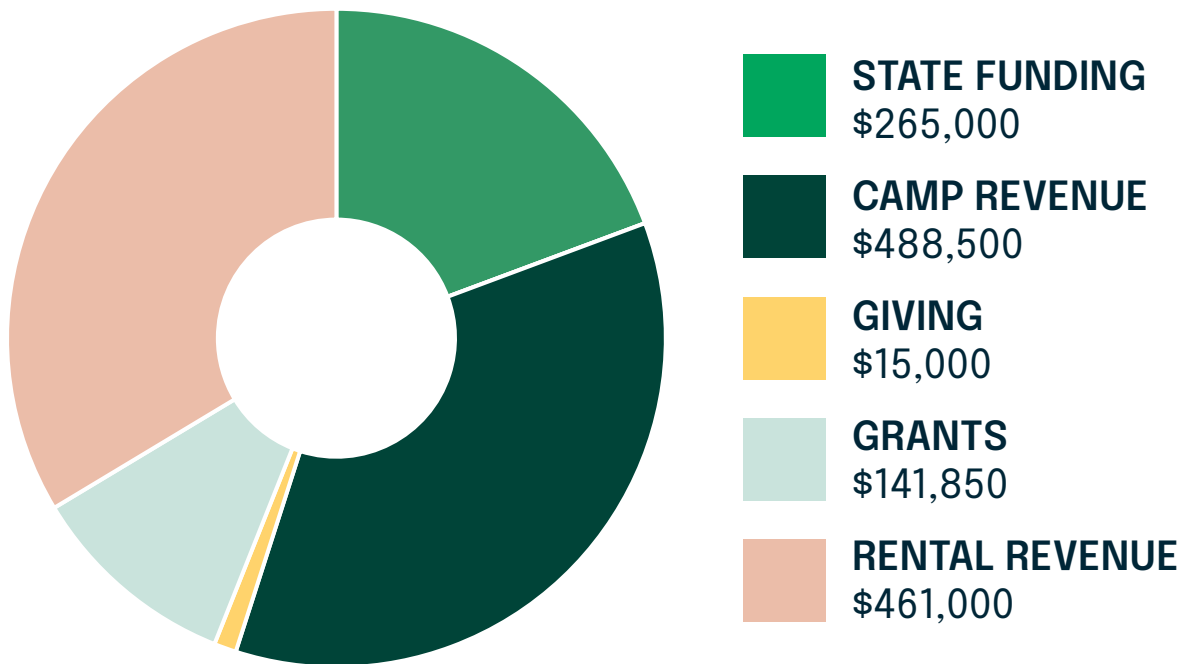
According to the National Library of Medicine, outdoor activities play a pivotal role in the development and maintenance of social capital and cohesion, which can influence mental health for adolescents. Statistics by healthdata.org show that Warren County is higher than the state average for self-harm mortality, mental disorders, and substance abuse disorders.

The Northern Virginia 4-H Educational and Conference Center’s mission is to facilitate proven experiential learning programs that educate, inspire, and connect. The NOVA 4-H Center is partnering with AT Kids, whose mission is to “give kids a chance to experience nature.” Monetary support by AT Kids helps award merit-based scholarships to allow youth to attend a week-long outdoor adventure camp that assisted 19 youth this summer.

Camper surveys from the adventure camp show that after attending, 81% reported having a good mental attitude, and 88% reported being able to properly handle success and failure.



## Funding by Source



  
**1,768**  
Youth Campers

  
**16**  
Total Camps

  
**171**  
Rental Groups

To find out how you can support your local 4-H Center,  
visit [www.cals.vt.edu/make-a-gift](http://www.cals.vt.edu/make-a-gift).

## Program Impacts

### Developing Leadership and Citizenship Skills Through the County 4-H Council and County 4-H Honor Club

Today's youth will be tomorrow's leaders in our communities. Young people need to learn and develop leadership and citizenship skills in order to be effective leaders. 4-H youth development programs are recognized as an effective model for youth to learn, practice and evaluate leadership, citizenship and life skills.

All 4-H Community Clubs have elected youth officers who receive leadership training in order to fulfill their officer roles. In addition, Shenandoah County has a County 4-H Council that is made up of three elected or appointed members and



one leader from each 4-H Club in the county. That group elects countywide officers who plan and run the seven meetings held during the year. They plan and conduct Club Officer Training for all club officers in the Fall and send members to the Board of Supervisors and the School Board meeting to tell their personal 4-H stories in celebration of National 4-H Week. During each of the County 4-H Council meetings, members share club and event updates and promotions, discuss and vote on business that affects the clubs, and make financial decisions to support countywide programs and events. There are also three standing committees in the County 4-H Council that meet as part of every meeting. Each committee elects a chair, and works with one of

the three County 4-H Council Adult Advisors. The committees are: Bike-A-Thon, Fair Booth, and Special Events. Each committee is responsible for planning, conducting, and evaluating countywide 4-H events during the year. All 4-H Clubs assist with each committee in some way.

Shenandoah County has a teen group, the 4-H Honor Club, whose members are selected through an application and peer interview process. The 4-H Honor Club has three adult advisors, and the group meets as needed during the year, usually three times. The Honor Club selects officers and gives leadership to the annual County 4-H Achievement Night Program and to the County 4-H Share-the-Fun program. They also serve in 4-H Ambassador type roles as needed.

For Achievement Night, Honor Club members set up the venue, assist with food service, serve as emcees and award presenters, assemble the annual 4-H year in review PowerPoint presentation and handle the collection and distribution of door prizes. They hold an Honor Club induction ceremony at the end of Achievement Night for new members, and then the entire group is responsible for clean-up.

For Share-the-Fun, Honor Club members run the mandatory practice day by setting up the venue, handling on-site registration, working with each act in a practice room to ensure they are ready to go on stage and have their staging sheets completed. Honor Club members also serve as show emcees, backstage workers, and refreshment coordinators.

During 2023, County 4-H Council members and officers gave leadership to:

- Countywide Club Officer Training that reached 24 members in October.
- Gave 10 speeches telling their 4-H story and recognizing National 4-H Week to the Board of Supervisors and to the School Board in October.
- Egg Hunt and craft activities for 29 club members during April.
- County 4-H Bike-A-Thon Fundraiser for 11 club members during April. \$1,440 was raised to support clubs and scholarships for members.
- Tractor Supply Paper Clover campaign exhibit staffing during April/May and October.
- County Fair 4-H Booth which was staffed every evening (seven nights) during the County Fair.

The County 4-H Honor Club members gave leadership to:

- County 4-H Share-the-Fun Rehearsal and Contest/Show for 17 members during February.
- County 4-H Achievement Night Covered Dish Dinner and Awards Program for 110 members and their families in November.



It is important to teach leadership and citizenship skills to each generation of young people, and allow them to practice those skills in real life settings, make and correct mistakes, evaluate their efforts, and be mentored and guided by VCE staff and trained 4-H volunteers. Based on anecdotal follow up from former members, many Shenandoah County 4-H members go on to become leaders in their college organizations, their communities, and are more employable in the workplace because of leadership skills learned and practiced through the 4-H program. Of the current key 4-H volunteers in Shenandoah County, 18 out of 29 (62%) are former 4-H members who are giving back to the program because of what they learned through 4-H.

### Family and Consumer Sciences SNAP-Ed Programming

The Northern Shenandoah Valley has a Family and Consumer Sciences SNAP-Ed Agent who serves the counties of Shenandoah, Frederick/Winchester, Clarke, Warren, Page, Culpeper, Fauquier, Orange, Madison, and Rappahannock.

Family and Consumer Sciences SNAP-Ed Agents help to create a culture of health in communities by increasing access to healthy choices in places where families eat, work, learn, play, or shop. When healthy options are actively present, it provides a layering effect, strengthening health and sustainability of these communities for long-term change – these are also known as Policy, Systems, and Environmental Changes.

#### SNAP-Ed Agents work in community settings including:

- Farmers Markets: Assist with onboarding markets to accept SNAP/EBT; Marketing and promotion of SNAP/EBT and incentive programs such as Virginia Fresh Match
- Healthy Food Retail: Increase healthy food access in food retail settings through a variety of strategies
- Food Pantries: Promote client-choice model, create policy changes, and provide environmental nudges
- Community Gardens: Provide free gardening curriculum for youth and offer a competitive mini-grant program towards garden initiatives
- Serve on community coalitions and committees focused on food access, nutrition, and physical activity

SNAP-Ed Agents encourage volunteer-led programs. They partner with eligible schools to recruit and train teachers to implement nutrition education in the classroom (grades Pre-K-12). Agents also train community volunteers, leaders, and students to deliver youth programs in after-school and community-based settings. Our target audience is SNAP-eligible youth and their families.



## 4-H Youth Explore the World Through International Travel

The Hispanic population in our area continues to increase. To learn more about interacting with Spanish speaking people, while being immersed in their culture, a partnership was developed between local 4-H teens and teens from the Dominican Republic. The partnership is meant to develop language skills, learn about Latino culture, and conduct meaningful service in the Dominican Republic.

This was the 15th year of a program that was built during 2006 through Virginia Tech's membership in the Punta Cana Association and partnership with the Punta Cana Ecological Foundation and Center for Biodiversity and Sustainability. Because of the Covid-19 Pandemic, this program was not held 2020-2022. In order to bring this program back in 2023, we had to rebuild our network and reach out to our contacts to start again.



VCE received funding to conduct a networking trip to Punta Cana to meet with contacts and rebuild the partnership. Those contacts were easier to make in person than through email, phone, or Zoom given the language challenges. Some things had changed, but our record of service to the local children remained. Our partners were happy to see us and anxious for our group to come back again and conduct 4-H Day Camp. We finalized our plans for the networking trip and identified a new school to include in our school supply donations. The new school had a library space but no money for books. That gave us the idea to collect simple English and Spanish children's books to

donate to the new school. We had our 4-H delegates collect books, add a 4-H sticker, and write a message inside each book. Our donation was well received.

Another big change we made this year was to advertise it statewide to all Virginia 4-H High School students, with a good recommendation from their Extension Agent. We added a "Sponsor a Dominican Camper" program in Shenandoah, Alleghany, and Highland Counties. This helped raise enough money to provide scholarships to 27 Dominican children from one of the poorest villages outside Punta Cana and provided their transportation to our 4-H Day Camp. Most of the donors were either 4-H All Stars or previous program participants.

Our 2023 delegation included 22 teens (nine from Shenandoah, two from Alleghany, two from Highland, three from Loudoun, two from Henrico, one from Accomack, one from Albemarle, one from Lee, and one from Montgomery). We also had seven adults (two volunteers from Shenandoah, one volunteer from Henrico, and one 4-H Agent each from Shenandoah, Alleghany, Highland, and Augusta). This was the largest group we had ever taken to the Dominican Republic. The large group posed some transportation challenges since we had to charter larger vehicles, which were very expensive, and they didn't always fit on the roads we needed to travel. Our group learned about flexibility and making it work.

While in the Dominican Republic, our group worked with 14 Dominican teen partners to lead craft projects, games, dancing, and environmental projects for a two-day 4-H Camp that reached 45 Dominican campers, ages 8-13. The service projects included collecting, sorting, and donating school supplies to two very poor schools in the villages of Veron and Juanillo, and we sent another group of supplies and games to an after-school program in Santo Domingo through one of our Dominican partners. The Dominican and Virginia teens worked together to pick up trash in a small local village of Domingo Maiz. We also refreshed the 4-H Clover on the community wall that we painted in 2015. Additional activities included snorkeling over a coral reef, visiting two Dominican homes and eating a traditional Dominican meal, learning about projects and research at the Foundation, and taking a field trip to the nearby city of Higüey to visit the farmers market, a small farm, and other cultural sites.

## 4-H Conservation Awareness Day Cultivates Middle School Students into Environmental Advocates, Inspiring the Next Generation Through Conservation Education

Middle school is a crucial age where students are developing their values and beliefs. By instilling conservation awareness at this stage, we can foster a sense of responsibility and stewardship towards the environment and integrate sustainable behaviors into their daily lives. According to the 2023 Virginia Cooperative Extension Situation Analysis Report for Frederick County, Virginia, Agriculture, natural resources, and environmental illiteracy in adults and youth is a high priority. Creating a program to reach middle school students could potentially create life-long environment stewards and inspire youth to pursue careers in environmental science, ecology, conservation biology, or related fields. This could contribute to a skilled workforce dedicated to finding sustainable solutions to global environmental issues.



Frederick County 4-H partnered with Frederick County Middle School and R.E. Aylor Middle School to implement a 4-H Conservation Awareness Day program in May. The target audience for this program was the entire sixth grade from the two middle schools. The first part of the day was spent at Frederick County Middle School, and the second half was spent at R.E. Aylor Middle School. Frederick County 4-H collaborated with community members, businesses, and youth groups to present during Conservation Awareness Day. The presenters included Blue Ridge Wildlife, Extension Agent Mark Sutphin from Virginia Cooperative Extension, James Wood High School FFA, Lord Fairfax Soil and Water Conservation District, Northern Shenandoah Valley Audubon Society, 4-H Agent Spring Vasey from Virginia

Cooperative Extension, Sherando High School FFA, Virginia Department of Forestry, and Virginia Department of Wildlife Resources. Frederick County 4-H partnered with the schools and teachers to organize rotating stations to ensure all students could attend each educational station. There were nine educational stations providing information about: creating your own hydroponic herb jar, the wildlife rehabilitation process, information about beekeeping and sampling honey, hands-on erosion demonstration, the importance of biodiversity, the importance of birds within wetlands, identifying sources of food that come from wildlife, a day in the life as a forester, and conserving and managing wildlife populations. This hands-on program aimed to introduce conservation awareness to sixth graders at an early age, fostering familiarity with environmental issues and inspiring a sense of responsibility towards protecting the environment. Early exposure is instrumental in helping students comprehend the importance of sustainable choices in addressing challenges like biodiversity loss, global warming, and pollution.

In 2023, 490 sixth grade students from two middle schools participated in the 4-H Conservation Awareness Day program. The 4-H educators, teachers, and volunteers logged 660 hours preparing and facilitating this program. Providing this program encouraged students to use critical thinking skills by prompting students to analyze environmental issues, understand cause-and-effect relationships, and explore potential solutions. This type of critical thinking is valuable for academic success and for addressing complex real-world challenges. The purpose of the 4-H Conservation Awareness Day for 6th graders was to educate, inspire, and empower students to become environmentally conscious individuals who actively contribute to the well-being of the planet.



## 4-H Nurtures Leadership and Community Impact in Local Teens by Creating Opportunities to Empower Teens to Become Tomorrow's Leaders

Today's teenagers have evolving needs; the Frederick County 4-H program recognizes the importance of fostering personal growth, leadership, and community engagement. Tailored for their age group, teen-specific groups and activities contribute significantly to the holistic development of teenagers by fostering identity formation, social skills, emotional support, and a sense of community. These experiences lay the foundation for positive mental health and well-being in adulthood. According to the 2023 Virginia Cooperative Extension Situational Analysis Report for Frederick County, Virginia, youth mental health and empowering youth are a top priority. Moreover, the 2022 Gartner HR research identifies human leadership as the next evolution of leadership. Their research study revealed that 69% of millennials express concern about the lack of leadership skill development opportunities available to them. Addressing those needs, Frederick County 4-H provides several opportunities for our community's teenagers. This includes the Frederick County 4-H Teen Council group, 4-H Summer Camp Counselor positions, and leadership roles for the Frederick County 4-H Horse Day Camp.



Frederick County 4-H actively addresses the developmental needs of teenagers through multifaceted programs. The Frederick County 4-H Teen Council empowers members to take on leadership roles, guiding them through Frederick County activities to ensure they create impactful and memorable experiences for other 4-H members. Meeting quarterly, the council brainstorms county activities, community service projects, and ways to enhance their local 4-H program. The Frederick County Teen Council collaborates with 4-H staff to assist with programs such as the Frederick County 4-H Achievement Banquet, Share-the-Fun, Officer Training, and County Contest Day, where they assist the judges and announce speakers. Frederick-Page 4-H Summer Camp provides 14 to 18-year-olds with the opportunity to attend camp in a leadership capacity, offering intensive training to equip them for the responsibilities of leading and inspiring their peers. Counselors are responsible for escorting campers to their daily 3-periods of classes and keeping a head count of campers when traveling across camp to events during the day. Counselors are empowered to lead 'pack' meetings during camp. During those meetings, they create songs, skits, or 'yells' to present during their nightly campfire. Counselors are responsible for overseeing their bunk rooms with campers and ensuring campers wake up and complete their morning tasks before breakfast. Counselors aid campers with homesickness, and most importantly, become a reliable friend and role model to the campers. Moreover, the Frederick County 4-H Horse Day Camp provides avenues for older 4-H youth to give back to the community. These dedicated counselors spend four days preparing workshops, serving as positive role models, ensuring camper safety, reinforcing good 4-H behaviors, and imparting valuable lessons about acceptance. For day camp, counselors arrive early each morning for camper drop off and spend the entire day teaching about the many aspects of the equine industry.

In 2023, eight teenagers enrolled in the Frederick County Teen Council, participating in five business meetings and several additional activities throughout the year. Additionally, 27 youth served as Frederick-Page 4-H Camp Counselors, while eight youth took on roles as Frederick County 4-H Horse Day Camp Counselors. The impact of empowering our youth extends beyond local boundaries, with five teens selected as Virginia 4-H Delegates for National 4-H Events, one serving as a cabinet member for Virginia 4-H, two members recognized as 4-H All Stars, one member chosen for a Virginia 4-H Youth in Action Award, and one member appointed as a Shooting Education Ambassador for Virginia. Furthermore, the Frederick County Teen Council demonstrated their commitment to community service through several impactful projects. Such as conducting a hat & glove drive and collecting over 70 items. The teen council hand-made ornaments to use to decorate a community Christmas tree inside a local nursing home, resulting in creating joy and a festive atmosphere to the nursing home residents. Additionally, this fostered a sense of community and connection between teenagers and the elderly residents in the nursing home. It promoted intergenerational bonding and a feeling of inclusivity.



Our teens have collectively dedicated 4,126 hours (about five and a half months) of their time, showcasing their commitment to community service. The estimated value of their volunteer hours is \$61,807.48. This underscores their dedication to making a positive impact and reinforces the invaluable role 4-H plays in shaping the leaders of tomorrow.

Participating teenagers have undergone significant personal development. Skills gained include leadership, public speaking, teamwork, and a commitment to community service. These beloved 4-H members are not only contributing to the betterment of their community but are also becoming well-rounded individuals prepared for the challenges of adulthood.



### **Management of Livestock Mortality in Catastrophic Situations**

In early 2023, there was an outbreak of Highly Pathogenic Avian Influenza (HPAI) in Rockingham County, VA. HPAI is a highly contagious airborne respiratory virus that spreads quickly among birds through nasal and eye secretions and manure. The virus can be spread through interaction between wild birds and domestic birds, flock to flock, equipment, vehicles, and on the clothing and shoes of caretakers. This virus affects poultry, like chickens, ducks, turkeys, and wild bird species such as ducks, geese, shorebirds, and raptors. Fortunately, the existing strains have not created human health issues/concerns.



Preventing the disease from spreading to additional poultry requires good biosecurity practices by farmers and rapid response to contain and eliminate the disease. This includes collaboration among farmers, the poultry industry, and all agencies (the USDA Animal Plant Health Inspection Services, Virginia Department of Agriculture and Consumer Services, Virginia Cooperative Extension, and localities). One important component to preventing the disease from spreading includes disease elimination and subsequent safe disposal of infected poultry. Composting is used to eliminate the disease from infected poultry. The finished compost is subsequently applied to farmland as a fertilizer and soil amendment.

Virginia Cooperative Extension maintains a list of “carbon sources” to ensure a ready supply of woodchips and sawdust to augment the composting process. Two vendors from this list were used during this response. Extension also served as a technical advisor for guiding the composting process. Once the HPAI Quarantine was lifted from the farms, the VCE-Shenandoah Agriculture Agent went back to the farms to sample the compost to teach the farmers how to apply the compost as a crop fertilizer source (i.e. the final step in the disposal process).

This HPAI outbreak only hit two farms in the region. It is a small miracle that additional farms were not infected because there are a lot of poultry farms in this part of the county. Epidemiology reports show that both farms were infected through wildlife contact and not through farm-to-farm movement of people or equipment. Factors that contributed to this successful outcome include good biosecurity practices by farmers and rapid response by farmers, industry, and all cooperating agencies.

## 4-H Embryology in the Classroom Transforms Elementary Education by Fostering Scientific Inquiry Through Hands-On Science Education and Responsible Citizenship

Raising chicks from eggs mimics real-world scenarios, helping students connect theoretical knowledge with practical applications. This type of experiential learning can enhance comprehension and retention of scientific concepts for children. According to the 2023 Virginia Cooperative Extension Situation Analysis Report for Frederick County, Virginia, the need for agriculture education was a top priority. Creating an in-classroom embryology project, accessible for our busy teachers, will create a positive learning environment and an exciting hands-on learning experience for elementary age students.

The Frederick County 4-H program partnered with Redbud Run Elementary School, Daniel Morgan Intermediate School, Evendale Elementary School, and Virginia Avenue Charlotte DeHart Elementary School; all located in Frederick County, Virginia. Our target audience was second to fifth grade students. We received a grant from Farm Credit Foundation for Agricultural Advancement for \$1,530 for the new program. These funds purchased incubators, heat lamps, thermometers, hydrometers, chick feed, feeder and water containers, educational materials, fertile eggs, and miniature flashlights for candling. Frederick County 4-H educators conducted two, 28-day sessions, visiting each classroom once. The sessions were conducted in the spring, during March and April. The classroom session topics included introduction to embryology, chicken terminology, the reproduction system of a chicken, parts of the egg, the difference between fertile and infertile eggs, characteristics of living things, the basic needs of living things, the life cycle of a chicken, and observing their eggs in the incubator. Students monitored the chicks moving, and breathing, candled an egg to observe the inside of the egg, took care of chicks, and learned about genetic markers, agricultural commodities, chicken processing, and chicken producers. The key elements of the *“Embryology in the Classroom Program”* were to care for unhatched eggs, observe the process of the embryo growing, and caring for the chicks once they hatched. This hands-on project brings together different scientific subjects like biology, anatomy, physiology, and environmental science. It gives students a complete understanding of life cycles, ecosystems, and how living organisms depend on each other.



In 2023, 360 students across ten classrooms, spanning grades second through fifth, participated in the *“Embryology in the Classroom Program”*. The 4-H educators and classroom teachers logged a total of 250 hours spent educating during the program. Providing this program allowed students to experience many new opportunities. Over half of the participating teachers reported that more than 75% of students demonstrated responsibility and a greater appreciation for living things. Between 50% and 75% of students increased their skills in observation, comparison, measurement, and data interpretation as a direct result of participating in the 4-H *“Embryology in the Classroom Program”*. Teachers reported increased enthusiasm among students and noted improved retention of science-related content. This project aimed to foster hands-on learning experiences for students, allowing them to explore the science of embryology through the incubation and hatching of chicken eggs. Overall youth have a deeper understanding of life cycles, biology, and responsibility, aligning seamlessly with 4-H's commitment to positive youth development and education.

## Northern Shenandoah Valley Drinking Water Testing Program Yields Positive Results

The Northern Shenandoah Valley of Virginia is located in an area of karst terrain, which results from a large proportion of soluble rocks, such as limestone and dolomite. The dissolution of those rocks causes cracks, fissures, and conduits that allow contaminants direct access to the groundwater. Coupled with poor landowner practices such as infrequent well water testing, improper well and septic system maintenance, and inappropriate lawn and garden care, the karst terrain makes the region's water supply particularly vulnerable to contamination.



Agents serving Clarke, Frederick, Page, Shenandoah, and Warren Counties offered water testing clinics in all five counties, allowing the programs to be advertised widely and enabling residents to cross county lines to attend the meetings that best suited their schedules and commuting patterns. Using funding available from previous programs and state grants, we discounted the kit purchase from \$65 down to \$20 for those who were first time participants or had an income less than \$70,000.

The Virginia Tech lab tested a total of 305 drinking water samples impacting 688 household members in the Northern Shenandoah Valley. Households received interpretation of results, information on maintenance and care of their private water supplies, and education on addressing problems. Seventy-two of the participants returned follow-up evaluations. At the time of the follow-up evaluation, 23 (32%) of the households had already taken at least one recommended action to improve their household water quality. Another nine indicated they planned to do so for a total of 41 (57%) of households acting on the recommendations. Many of those who had not acted indicated that their test results were positive and no action was needed. Recommended actions included seeking additional testing (11%), having their septic system pumped (6%), shock chlorinating their well (7%), purchasing water treatment equipment (14%), improving the functioning of existing treatment (22%), and more. All 72 (100%) indicated that they had gained useful information, the program was valuable to them, and that they feel more empowered to manage their water quality and water system. A sampling of some of the comments from participants about the program is as follows:

- “The testing allowed me to see the effect on our water supply by comparing before treatment and after treatment samples.”
- “Armed with the testing results I can make my well water safer for my family and myself, and be aware of local problems and concerns.”
- “This service was affordable and not tied to a water company trying to sell a softener or purification system.”



## Tree Fruit Extension Program



Virginia ranks 6th nationally in apple production with a crop valued at over \$195 million. Apples are grown in the Northern Piedmont along with other tree fruit such as peaches, cherries, nectarines, plums, and pears. The tree fruit industry is an integral part of the areas agriculture, rural heritage, and economically important revenue stream for farms. With the expanding interest regional food systems, farm tourism, and direct to consumer sales, tree fruit production programs and local fruit sales connect the rural growers with the urban consumers in the northern district. The interface between rural and urban regions have made it possible to expand direct to consumer sales in this area.

Growers indicate that gross returns per acre for apples is between \$20,000 - \$30,000 at retail markets. However, USAApple reports that the cost per acre of production has increased 65% over the last two years, squeezing profit margins. The high value per acre necessitates intensive management strategies to prevent economic losses and to safeguard future harvests through horticultural management practices. Over 40 insect and disease pests affect the apple crops and the economic viability of those enterprises. Invasive and native insect pests along with over a dozen pathogens, damage fruit crops making them unfit for retail sales. Examples of these insect pests include the Brown Marmorated Stink Bug, Spotted Winged Drosophila, European Apple Saw Fly, Codling Moth, Oriental Fruit Moth, and the Spotted Lantern Fly. Furthermore, the climate change in the Mid-Atlantic region has created a longer growing season and multivoltine generations of insect pest. Plant pathogens such as bitter rot caused by the pathogenic fungi in the *Colletotrichum* genus, is more prevalent because of the climate change. Bitter rot manifests itself post-harvest while the apples are in storage, further complicating the problem and marketability of the fruit. Climate change is affecting Virginia's Fruit production; premature warming in early spring accelerates plant development and flowering. This is often followed by sub-freezing spring temperatures killing the fruit buds and reducing yields and marketability. Subsequent excessive rainfall creates intense disease pressure that requires additional applications of fungicides. These recurrent weather patterns create vulnerability to tree fruit production and profitability.

A series of regional meetings were held for the growers to provide methods for controlling these pests including: chemistry rotations, horticultural practices, and web-based pest management models that predict infection periods. Pesticide recommendations, resistance management, marketing information, and horticultural topics were provided through a series of 15 educational meetings. These programs were held in Rappahannock, Nelson, and Frederick Counties. The Network for Environment and Weather Applications (NEWA) weather stations located in Rappahannock County and the Alson H. Smith, Jr. AREC provided area tree fruit growers with real time weather information to make informed decisions about pest management. These weather stations record wetting periods and temperature. The NEWA software provides pest management models based on tree phenology and weather for optimizing efficacy. The use of the model has proven to reduce the tree fruit pathogens and insect damage.

Based on the spray records reviewed during the growing season, 90% of the growers are implementing pest management strategies they learn about during Fruit Schools, and Orchard Meetings. Each grower interviewed had followed recommendations learned at the meetings and found in the Commercial Tree Fruit Spray Bulletin.



Growers continue to adopt the use of pheromone traps to monitor orchard insect pressure and base their decision to spray based on economic thresholds determined by trap counts. Those decisions have improved efficacy and reduced environmental degradation. The use of pheromone traps has become increasingly important as broad-spectrum pesticides such as organophosphates/Lorsban were banned by the EPA for use on food crops in 2021. Growers are adopting environmentally benign and target specific pesticides instead of using broad-spectrum pesticides and are gradually understating where these new technologies fit within their spray programs. Growers have also adopted the use and efficacy of the mating disruption sprayable pheromones. These novel products are effective for controlling

codling moth, oriental fruit moth populations, and reducing fruit damage. Pollinator protection is another realized benefit.

Mating disruption technology is an effective method to reduce codling moth and oriental fruit moth damage. One grower commented that he had reduced the applications of broad-spectrum insecticides by 66% because of mating disruption techniques that rely on Integrated Pest Management (IPM) scouting data. He indicated that he relied on VCE's IPM work to make informed decisions about managing orchard insect pests. Climate change is another challenge that has growers seeking alternative varieties that are less susceptible to cold damage and tree fruit pathogens. Hybrid varieties of wine grapes were recommended because of their disease-resistance and cold tolerance. Chambourcin was recommended as an alternative variety in five freeze/frost prone areas.

Intergraded Pesticide Management, coupled with "softer" pest specific technology, has improved environmental health and reduced the negative impact on non-target, beneficial insects. The IPM programs introduced to farmers have increased biological control of invasive insects. Creating an environment within the orchards that fosters the increase of egg parasitism (*Trissolcus Japonicus*) has significantly reduced brown marmorated stink bug damage.

Human health topics are rarely mentioned in fruit production workshops or the impact Extension is having on improving food safety related to pesticide use. Reduced pesticides, and the adoption of less toxic pesticides, and biopesticides, have significantly diminished pesticide residues found on orchard crops; i.e. less pesticide exposure to the consumer. Pesticide residue tolerances were within EPA guidelines. Compliance with Worker Protection Standards have prevented agricultural employees from pesticide exposure. Fortunately, Virginia Department of Agriculture and Consumer Services (VDACS) did not report any acute pesticide poisoning in Northern Piedmont because our pesticide public health educational programs.

### **Northern Shenandoah Valley Pesticide Safety Education Program**

The federal and state pesticide laws require applicators to be certified to use restricted use pesticides. In addition, Virginia law requires all commercial applicators to be certified to use any pesticide and to renew their pesticide licenses through continuing education every two years. Without pesticide safety and Integrated Pest Management (IPM) education to enable these individuals to do so, many would suffer economic hardships and violate the law. A lack of knowledge threatens human health and the environment. There are over 550 certified commercial applicators, registered technicians, and private applicators in the Northern Shenandoah Valley.



In January 2023, Planning District 7 (PD7) VCE ANR Agents offered the annual commercial pesticide recertification workshop to 132 participants at West Oaks Farm Market in Winchester. Due to the proximity of PD7 to other states, this offering is certified by VA, MD, WV, DC, and PA for recertification. In March, a full-day core training followed by offering commercial, private, and registered technician examinations at the New Market Fire Hall was held for 54 participants. In Fall 2023, agents conducted four Virginia Department of Agriculture and Consumer Services (VDACS) approved re-certification programs in pesticide safety and IPM in Winchester, Woodstock, Front Royal, and Stanley. Additionally, private applicator recertifications were offered by PD7 Agents at the Winchester Area Fruit School and at the Mid Atlantic Fruit and Vegetable Conference in Hershey, PA in February.

During 2022, 117 private pesticide applicators and 141 commercial pesticide applicators were trained for recertification in PD7. The five-year total pesticide recertifications for license holders offered through VCE Northern Shenandoah Valley programs is 584 private applicators and 964 commercial applicators. Nearly 10,500 pounds of unwanted pesticides were collected through the VDACS Pesticide Collection Program. Pesticide Safety Education programming helps applicators ensure worker health, food safety, protection of water quality, and general environmental health by safe use of pesticides. It also builds the community labor force and improves workplace readiness through licensing and recertification.

## Strengthening Agricultural Viability in Page County and the Northern Shenandoah Valley



There are 519 farms in Page County with the average farm size of 139 acres. The majority of farms (78%) are less than 179 acres. In Page County, 39% of farmers are over the age of 65. This continues a long-term trend of aging in the producer population within Page County and the state of Virginia. This poses concern about how farm operators can transfer holdings while maintaining a sufficient income. A small percentage (4%) of farms are selling directly to consumers. It is pertinent to note that a quarter of farms do not have access to the internet and would need to be reached by other means of communication. Agriculture is an important part of the local economy and culture of Page County. Preserving farm and forest land, strengthening the local food system, and assisting farmers and

forest owners in production and profitability were identified as top issues in Page County by the 2023 community needs survey. Page County faces concerns about the loss of farmland. The quiet community and picturesque view make Page County an appealing community for retirees, remote workers, and those looking to be close to the city while living in a rural community. Concerns about lack of farm profitability, and problems associated with transitioning the farm to the next generation can increase pressure to develop the land.

In February of 2023, VCE held a 4-week Whole Farm Planning Course. During this course, 13 farming families were introduced to the services provided to them by the Natural Resource Conservation Service, Shenandoah Valley Soil and Water Conservation Service, Farm Credit, and Farm Service Agency. Participants practiced goal setting, took inventory of their physical and financial resources, conducted market research, assessed value-added programs, became aware of tax and legal considerations, and created a business plan and timeline. VCE-Page County's, ANR Extension Agent, was invited to join the Preserving Page County Agriculture Working Group. This initiative is focused on promoting sustainable farming practices and increasing farm profitability through diversified enterprises. The Extension Agent also joined the Page County Economic Development Agriculture Subcommittee. In this role, VCE has assisted the EDA with efforts to improve farm profitability and local food systems. Additionally, VCE assisted producers with various value-added marketing opportunities including: Beef Quality Assurance certification, farm to table school lunch program with Page County Public School, and Daughter of the Stars Farmers Market. VCE provided technical support to several new agritourism enterprises, a hydroponic lettuce operation, and a pick-your-own pumpkin patch.



Of the 13 families who participated in the Whole Farm Planning Course, 100% of participants reported that the quality of information presented was excellent. Of the participants, 40% reported that the course exceeded their expectations, and 87% reported feeling more confident about managing their agriculture business as a result of the course. In 2023, over 400 individuals received support and information related to agribusiness management and economics.

## Promoting Agriculture, Natural Resources, and Environmental Literacy in Page County Youth and Adults



Promoting agricultural, natural resource, and environmental literacy was identified as the second most important issue in the 2023 Page County Community Needs Survey. Environmental literacy is defined as the ability to make environmentally sound decisions and take appropriate action. Agriculture literacy is the understanding and knowledge of agriculture and its impact on society. Page County is rich in agriculture and natural resources. With the growing rural-urban divide, agriculture literacy is important for mutual understanding and respect. It is important for citizens to understand the economic, social, and environmental significance of agriculture. This issue is closely tied to the other issues of preserving farmland, forest land, protecting our environment, and agricultural viability. In

order to preserve and protect our resources, one must have a general knowledge and awareness of them.

In 2023, there were a variety of programs within VCE that addressed this need. The youth livestock program introduces 4-H'ers to livestock production projects. Agriculture lessons have been taught during after-school programs at three local public schools. In-school natural resource programs, like the "Goods in the Woods" program, help to introduce 2nd graders to natural resource literacy while nutrition programs such as "Read for Health" introduces 1st graders to locally grown produce. VCE-Page County participated with the Luray High School and Page High School FFA Chapters "Food for America" program. "Food for America" is an educational program focusing on agricultural literacy in elementary schools and communities. Additionally, programs focused on proper pesticide application, fertilizer application, soil health, and water quality offered in 2023 reinforce environmental literacy concepts to agriculture producers.

As a result of these programs, 486 youth and 562 adults engaged in agriculture and environmental literacy topics. Another 2,984 individuals received agricultural and environmental education via social media posts. Students who participated in the community garden field trips reported that they were more likely to engage in planting a garden and trying new vegetables as a result of their participation. Of the students who participated in "Read for Health", 96% reported they were more likely to try new foods as a result.



## Consumer Horticulture and Environmental Programming in the Northern Shenandoah Valley



For over 40 years, Extension Master Gardeners (EMGs) have assisted state and county faculty in providing current, relevant, research-based, and timely responses to Virginia’s homeowners who need assistance with their home landscapes. As personnel resources diminish, we rely more heavily on our volunteers to help deliver quality programming and services to our constituents. The work of EMGs is important in multiplying the efforts of our paid faculty as they impart best practices to homeowners wishing to manage their landscapes in sustainable and environmentally friendly ways. In the Northern Shenandoah Valley (NSV), there is a population of over 229,000 individuals residing in the counties of Clarke, Frederick, Page, Shenandoah, Warren and the City of Winchester. There has been an active network of EMGs in the NSV since 1993. 2023 marked our 30<sup>th</sup> anniversary of the NSV EMG Program.

In 2023, the annual EMG training in the NSV was offered to 17 new EMGs. The annual seed exchange at Blandy Experimental Farm drew 519 participants and the 2023 Gardening in the Valley Symposium at Shenandoah University offered 125 attendees home horticulture education. GardenFest at Belle Grove was an incredible success. There was record attendance for this 13<sup>th</sup> annual plant festival with nearly 1,500 participants attending workshops, children’s activities, educational booths, and plant sales. NSV EMGs offered a 3<sup>rd</sup> annual garden tour with a one-day tour of various gardens. The event welcomed over 90 community members to five different gardens (EMG home gardens, education and demo gardens, as well as a commercial nursery), each staffed with EMG volunteers to teach and lead attendees through educational experiences with each garden and ecosystem. \$1,365.64 in proceeds from ticket sales were donated to the Clarke and Warren County 4-H Programs for camp scholarships. Additionally, we celebrated the 30<sup>th</sup> anniversary of the NSV EMG program with a public screening of “Bringing Nature Home” with 150 community members in attendance.

In 2023, EMGs participated in four radio interviews and 11 interviews for newspaper articles and other printed publications. NSV EMGs work to conduct 50 different educational programs, projects, and events in-person and virtually with a goal of extending best management practices and knowledge into the local communities.



Significant effort was made to educate via Facebook (<https://www.facebook.com/NSVMGA>), quarterly newsletter (<http://nsvmga.org/newsletter/>), and via the local association website (<http://nsvmga.org/>).

17 trainees participated in the 2023 EMG trainings and joined forces with the 163 active EMGs, Emeritus, and Interns in the NSV. EMGs reached 831,341 contacts in 2023 and reported 16,245 volunteer and continuing education hours. The volunteer time equated to more than 8 full-time equivalents. This means that collectively, VCE had an additional 8 full-time, non-paid, staff disseminating best practices in the NSV. The economic value of the reported volunteer time is \$526,165.55 (based on an hourly rate for Virginia of \$32.59 from the independent sector), a tremendous in-kind contribution and return on investment to the NSV.

The 5-year figures for the five-county region, include reaching 2,219,664 educational contacts through 73,930 volunteer hours at a value of \$2,203,113.03. These numbers speak volumes, but it is really about the changed lives, improved environment, and healthy communities created by the efforts that these numbers represent. Extension volunteers help train and empower youth to grow their own fruits and vegetables, they provide community members with best management practices for residential horticulture activities, they offer appropriate pest identification to reduce misuse and overuse of pesticides and fertilizers, and so much more.



## The Pandemic Drives Thriving Northern Shenandoah Valley Extension Master Gardener Seed Lending Libraries



Because of the COVID pandemic, interest in gardening soared internationally. Individuals spent more time at home with fewer structured work and community activities leaving a record number of individuals taking up gardening for the first time. This increased interest in gardening, along with supply chain disruptions, led to seed shortages.

With imposed pandemic restrictions on Extension Master Gardeners (EMGs), fewer volunteer opportunities existed for eager volunteers and trainees. A new cohort of EMGs in the Northern Shenandoah Valley (NSV) finished up a hybrid class that turned all virtual due to the pandemic. Seeking to fulfill their program requirement, to give back to the community with 50 volunteer hours, minimal opportunities existed in 2020. These restrictions continued into 2021 and canceled the annual seed exchange typically held by NSV EMGs at Blandy Experimental Farm (<http://nsvmga.org/events/seed-exchange/>). The annual NSV EMG seed exchange at Blandy Experimental Farm resumed in January 2022.

The 2023 National Gardening Survey found the following: “Inflation was a major factor for over half of respondents in planning to increase or decrease their level of participation in lawn and gardening activities. To combat inflation, the most commonly used household practices were using water wisely, buying plants on sale, and growing plants from seeds. Over one-third of households anticipate increasing their spending on lawn and gardening products in 2023 compared to 2022, particularly for food gardening.”

In 2021, EMG volunteers worked to organize and establish seed lending libraries with several of our community libraries in the Northern Shenandoah Valley. EMG volunteers held virtual lessons to train one another about seed saving techniques, and EMGs collected seeds from their home gardens to provide to the newly established seed lending libraries. The details and public resources are communicated here: <http://nsvmga.org/programs/seed-lending-library/>.

As the public libraries opened back up in 2021 and 2022, a total of six seed lending libraries were developed and operate to this day across the Northern Shenandoah Valley.

- Clarke County Library, 101 Chalmers Court, Suite C, Berryville, VA 22611
- Bowman Library, 871 Tasker Road, Stephens City, VA 22655
- Handley Library, 100 West Piccadilly Street, Winchester, VA 22604 (accessible by public transportation)
- Page Public Library, 100 Zerkel Street, Luray, VA 22835
- Shenandoah County Library, 514 Stoney Creek Blvd., Edinburg, VA 22824
- Samuels Public Library, 330 E Criser Road, Front Royal, VA 22630

In 2023, 104 EMG volunteers contributed 1,171 volunteer hours towards the efforts of saving, sorting, and packaging seeds to distribute through the libraries and seed exchange. Public lectures were offered at the libraries to educate the public on seed saving practices and how to utilize the lending library. 1,188 community members reported taking advantage of these seed acquisition opportunities and over 6,000 seed packets were distributed through the seven locations. These libraries and the seed exchange provided community members with ornamental, herb, and vegetable seeds and the opportunity to grow some of their own fresh fruits and vegetables. These efforts have increased geographical accessibility and expanded the timeframe to year-round opportunities in the NSV.



# Virginia Cooperative Extension Northern Shenandoah Valley Master Gardeners

## Clarke, Frederick, Shenandoah, Page, & Warren

### 2019 to 2023 Statistics:



163 Extension Master Gardeners



344,641.5 miles driven



2,219,664 total educational contacts (direct & indirect)



73,930 Volunteer hours



Value of volunteer time:  
\$2,203,113.03

Northern Shenandoah Valley Master Gardeners work to build a more resilient community.

### Local projects include:

- **GardenFest**, an all-day gardening festival at Belle Grove Plantation. Plant sales, children’s activities, lectures and more.
- **Youth Gardening Programs**, numerous activities across all five counties involve youth: 4-H day camps, Junior Master Gardener (JMG) homeschool sessions, JMG in-school sessions and library presentations, among others.

- **EMG Info Booths**, volunteers assist individuals with home horticulture questions at farmers markets, fairs, and other festivals as well as staff “Ask a Master Gardener” Help Desks in the VCE offices.

- **Seed Exchange at Blandy and Seed Lending Libraries**, an annual seed exchange at Blandy Experimental Farm and State Arboretum EMGs also manage seed lending libraries in community libraries.

- **Demonstration Gardens**, volunteers manage gardens and teach programs at various locations throughout the NSV: community gardens, children’s gardens, rain gardens, pollinator gardens, and native plant gardens to name a few.

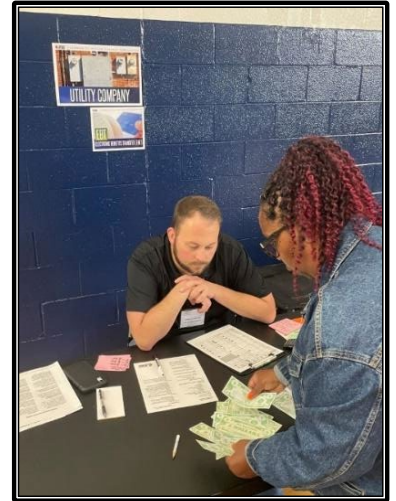


\*Based on hour value from Independent Sector Value of Volunteer Hours by State by Year  
Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and local governments. Its programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, military status, or any other basis protected by law.

## Northern Shenandoah Valley Poverty Simulations Help Participants Better Understand Families Who Are Struggling Financially

In 2023, nine percent of Northern Shenandoah Valley residents were living below the federal poverty level and an additional 32% were living below the Asset Limited, Income Constrained, Employed (ALICE) level, for a total of 41% of area households who are struggling. According to the most recent report issued in January 2023, the poverty threshold for a family of four is \$29,960. For an individual, the poverty threshold is \$14,891. Besides the negative financial aspects of being impoverished, it is also linked to poor nutrition and health, emotional distress, teen pregnancy, and academic failure.

Virginia Cooperative Extension hosts Poverty Simulations in the region to help individuals understand the real-life situations that families living in or near poverty must experience daily. The simulation gives participants a first-hand knowledge of the decisions these families have to make, their fears, and frustrations. In the simulation, 44 to 82 participants assume the roles of up to 26 different low-income families living on a limited budget. Some families were newly unemployed, some were recently deserted by the primary wage earner, some are homeless, and others are recipients of TANF (temporary assistance for needy families), either with or without additional earned income. Still others are senior citizens receiving disability or retirement checks or grandparents raising their grandchildren. The task of the "families" is to provide for basic necessities and shelter during the course of four 15-minute "weeks." The major strategy of the simulation is to allow participants the opportunity to interact with resources that would be found in low-income communities such as; a bank, childcare center, grocery store, payday/car title lender, employer, utility company, pawn broker, social service agency, faith-based agency, mortgage company, school, and community health care facility.



Virginia Cooperative Extension in the Northern Shenandoah Valley offered two Poverty Simulations hosted by Page County Public Schools and Winchester City Schools. Ninety-two people participated in the simulations, with 67 completing the evaluation. Many of these moderately or significantly increased their empathy for those experiencing poverty (91%), their understanding of the financial pressures for those with limited resources (90%), their sense of the positive and negative impacts of the service system on people experiencing poverty (84%), and their awareness of the emotional stresses and frustrations created by having limited resources. Twenty-seven people completed the 3- to 6-month follow-up evaluation. Of

those, 24 (89%) agreed that they have an increased understanding of the difficulties of improving one's self and becoming self-sufficient on a limited income. These participants described some of the things they have done differently since participating, commenting, "I try very hard to check my implicit biases before, during, and after interactions;" "Provide resources to help make ends meet, get assistance, and connections;" and "We have worked more thoughtfully in accommodating requests of parents specific to student meetings and offering additional dates and times." One participant summarized the experience this way, "It was eye-opening, intense, and evidence of the hopelessness people must quickly come to feel."

## Meet the Staff Serving the Northern Shenandoah Valley

### Clarke County

Claudia Lefevre 4-H Youth Development Extension Agent; Unit Coordinator  
Lindsay Phillips Administrative and Fiscal Assistant  
Vacant\* Agriculture & Natural Resources Agent – Local Foods

540.955.5164

[clefeve@vt.edu](mailto:clefeve@vt.edu)

[lphillips@vt.edu](mailto:lphillips@vt.edu)

### Frederick County

Mark Sutphin\* Agriculture & Natural Resources Agent – Horticulture;  
Unit Coordinator  
Hannah Copp\* Family & Consumer Science Agent – Food, Nutrition & Health  
Spring Vasey 4-H Youth Development Extension Agent  
Tammy Epperson 4-H Youth Development Technician  
Kim Costa\* Nutrition Education Facilitator  
Joanne Royaltey Consumer Horticulture & Invasive Species Program Associate  
Jennifer Fost Secretary  
Marsha Wright Administrative and Fiscal Assistant

540.665.5699

[mark.sutphin@vt.edu](mailto:mark.sutphin@vt.edu)

[hbcopp23@vt.edu](mailto:hbcopp23@vt.edu)

[smvasey@vt.edu](mailto:smvasey@vt.edu)

[tepperso@vt.edu](mailto:tepperso@vt.edu)

[kimcosta@vt.edu](mailto:kimcosta@vt.edu)

[royaltey@vt.edu](mailto:royaltey@vt.edu)

[jfost@vt.edu](mailto:jfost@vt.edu)

[mawrigh4@vt.edu](mailto:mawrigh4@vt.edu)

### Page County

Elizabeth Baldwin\* Agriculture & Natural Resources Agent – Animal Science;  
Unit Coordinator  
Meagan Dyer 4-H Youth Development Extension Agent  
April Mays Administrative and Fiscal Assistant

540.778.5794

[elizam3@vt.edu](mailto:elizam3@vt.edu)

[meg21@vt.edu](mailto:meg21@vt.edu)

[aprilang@vt.edu](mailto:aprilang@vt.edu)

### Shenandoah County

Bobby Clark\* Agriculture & Natural Resources Agent – Crops & Soil Science  
Unit Coordinator  
Carol Nansel 4-H Youth Development Extension Agent  
Kelsey Kline\*\* Family & Consumer Science – SNAP Education  
Teresa Richardson Administrative and Fiscal Assistant

540.459.6140

[raclark@vt.edu](mailto:raclark@vt.edu)

[cnansel@vt.edu](mailto:cnansel@vt.edu)

[kmken06@vt.edu](mailto:kmken06@vt.edu)

[trichard@vt.edu](mailto:trichard@vt.edu)

### Warren County

Corey Childs\* Agriculture & Natural Resources Agent – Animal Science  
Unit Coordinator  
Karen Poff\* Family & Consumer Science – Family Financial Management  
Emily Shultz 4-H Youth Development Extension Agent  
Octavia Walker Administrative and Fiscal Assistant

540.635.4549

[cchilds@vt.edu](mailto:cchilds@vt.edu)

[kpoff@vt.edu](mailto:kpoff@vt.edu)

[eshultz@vt.edu](mailto:eshultz@vt.edu)

[owalker@vt.edu](mailto:owalker@vt.edu)

\* Serve the counties of Clarke, Frederick, Page, Shenandoah, and Warren

\*\*Serve the counties of Clarke, Culpeper, Fauquier, Frederick, Madison, Orange, Page, Rappahannock, Shenandoah, and Warren

## Others serving the Northern Shenandoah Valley but are housed in another district:

Eric Bendfeldt Housed in Northern District Office  
Extension Specialist, Farm-to-Table; Community Viability

540.432.6029

[ebendfel@vt.edu](mailto:ebendfel@vt.edu)

Adam Downing Housed in Madison County  
Agriculture & Natural Resources Agent – Forestry

540.948.6881

[adowning@vt.edu](mailto:adowning@vt.edu)

Roland Terrell Small Farm Educational Outreach Program  
Virginia State University Regional Program Assistant

804.892.4612

[rterrell@vsu.edu](mailto:rterrell@vsu.edu)