

Northern Shenandoah Valley 2020 Annual Report

Virginia Cooperative Extension

Clarke County

Frederick County

Page County

Shenandoah County

Warren County

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Extension is a joint program of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and state and local governments.

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Noteworthy Metrics for 2020 Programming



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



\$758,707.00 value of
volunteer time
contributed*



1,138,625 virtual
educational contacts*



777 volunteers*



1,858 youth enrolled
in 4-H*



5,862 face-to-face
youth educational
contacts*



11,095 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

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STORIES OF IMPACT

The Clarke County 4-H program had a successful year, with 4-H members participating in a variety of virtual contests at the state and national levels. One such program that received overwhelming support from the community during the COVID-19 pandemic was the Clarke County Junior Livestock Show and Sale. Community organizers, local businesses, private donors, and volunteers banded together and raised over \$16,000 in donations to ensure the show would go on as scheduled. As a result, the 4-H and FFA exhibitors brought in more than \$156,000 for the sale of their livestock projects. Without the support of the Clarke County community, most of these youth would have incurred a loss that could have impacted their livestock projects for 2021.



Twin sisters Kiley and Dana take home Senior Grand Champion and Senior Reserve Champion Goat Showmanship.

AGENTS OF POSITIVE CHANGE

"We are working with farmers, residents, commercial industries, and local government to educate, raise awareness, and help manage spotted lanternfly — an invasive insect to agriculture, the forest industry, and general commerce — as well as a nuisance in the home landscape. The pest was first identified in the U.S. in Clarke County in 2019 and in Berryville in 2020."



Mark Sutphin

Extension Agent
Agriculture and Natural Resources, Horticulture

COMMUNITY VOICES

"This year was quite a challenge. Investing in show animals before COVID-19 and then not getting to show was very discouraging, but due to my son's dedication and love for showing, he decided to proceed. Clarke supporters made sure they were able to show. The pandemic had many teachable moments!"



Leea Shirley

Parent and Volunteer
4-H Youth Development

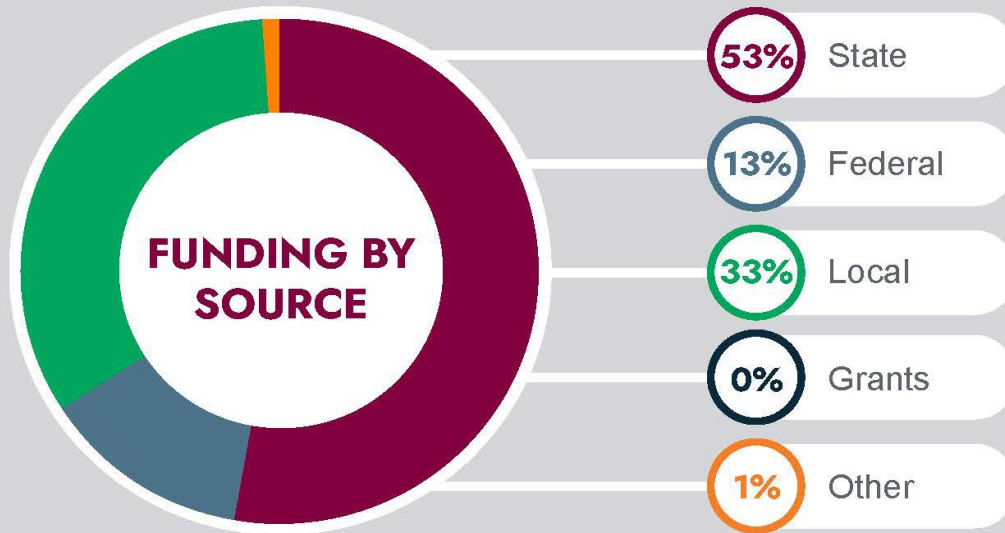
GET IN TOUCH

524 Westwood Road, Berryville, VA 22611
clarke.ext.vt.edu | 540-955-5164

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CLARKE COUNTY BY THE NUMBERS

TOTAL FUNDING: \$173,618



CLARKE POSITIONS

Claudia Lefevre
Extension Agent
4-H Youth Development



\$3.02

RETURN ON INVESTMENT FOR EVERY
DOLLAR INVESTED BY THE COUNTY
IN CLARKE COUNTY

\$58,376

VALUE OF EXTENSION
VOLUNTEER HOURS IN
CLARKE COUNTY



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STORIES OF IMPACT

The 4-H embryology program was in full swing for three days before COVID-19 shut down all Extension in-person programming. We had 134 students in two Frederick County schools participating in the embryology program. In an effort to continue the program, we created a virtual learning environment through Facebook and Google Drive. Included in the modified embryology program were daily egg updates, research-based publications, and videos showcasing significant changes in chick development. We ended the embryology program with a livestream of the chicks hatching and updates on how many total chicks hatched.



Chicks hatch in an incubator.

We received positive feedback from parents and teachers who were grateful to us for providing an avenue for stress relief and a relatively normal learning experience for the students.

AGENTS OF POSITIVE CHANGE

"The Read for Health program is truly remarkable! I participated in educating first graders on nutrition, and I saw how joyful children are about learning how to eat well and keep their bodies healthy. They love to try new foods --- whether or not it results in them liking it."



Vanessa Santiago

Associate Extension Agent, Family and Consumer Sciences, Food, Nutrition, and Health

COMMUNITY VOICES

"Extension agent Corey Childs helped me connect all my Beginning Veteran Farmer Training so I could create a solid integrated livestock and produce farm business plan. I finally see logical steps I must take to attain my farm's vision."



Rich Faucher

Owner, Faucher Farms

GET IN TOUCH

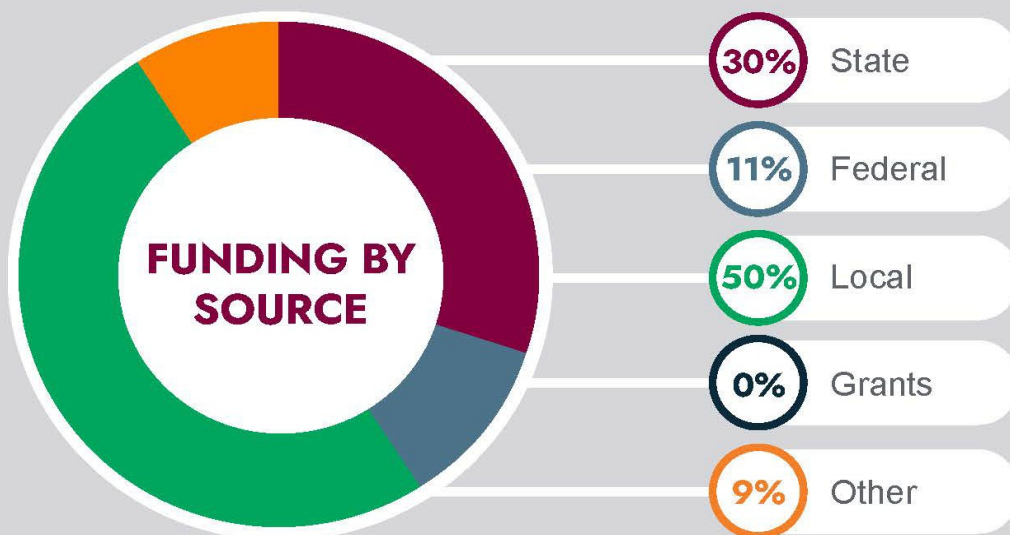
107 N. Kent St., Winchester, VA 22601
frederick.ext.vt.edu | 540-665-5699 | 



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FREDERICK COUNTY BY THE NUMBERS

TOTAL FUNDING: \$538,001



FREDERICK POSITIONS

Mark Sutphin
Extension Agent
Agriculture and Natural Resources

Dyllan Chapins
Extension Agent
4-H Youth Development

Vanessa Santiago
Extension Agent
Family and Consumer Sciences



RETURN ON INVESTMENT FOR EVERY
DOLLAR INVESTED BY THE COUNTY
IN FREDERICK COUNTY

\$788,314

VALUE OF EXTENSION
VOLUNTEER HOURS IN
FREDERICK COUNTY



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STORIES OF IMPACT

Gardening is a great way to access healthy food and get active. A community garden was built in Stanley at the Rural Health Clinic. In partnership with PACA --- the community organization running the garden --- nutrition education videos were provided online and three virtual food demonstrations were conducted on the Virginia Family Nutrition Program's Facebook page. The garden also hosted volunteers as part of socially distanced garden maintenance days throughout the harvest season.



Lettuce and tomatoes grow in the garden available to be harvested by any community member.

At Luray Elementary, 40 students were provided with Garden to Go kits that included plants, soil, and pots to grow their own cherry tomatoes at home. The kits were delivered through the school summer meal service. Along with these gardens, educational materials on how to care for their plants and recipes for cherry tomatoes were provided to the students.

AGENTS OF POSITIVE CHANGE

"Over the past five years, 161 Extension Master Gardeners serving the Northern Shenandoah Valley (Clarke, Frederick, Page, Shenandoah, and Warren counties) have logged 72,539 volunteer hours and reached nearly 333,000 educational contacts."



Mark Sutphin

Extension Agent
Agriculture and Natural Resources, Horticulture

COMMUNITY VOICES

"I kept a calendar with times to worm, weigh, and feed my animals. This helps with daily gains and feed conversion so that next year I can change feed to help my cost. My records show me how to keep my animals healthy and make sure my biosecurity plan is working."

Coby Housden

Junior Stockman
4-H Club Member

GET IN TOUCH

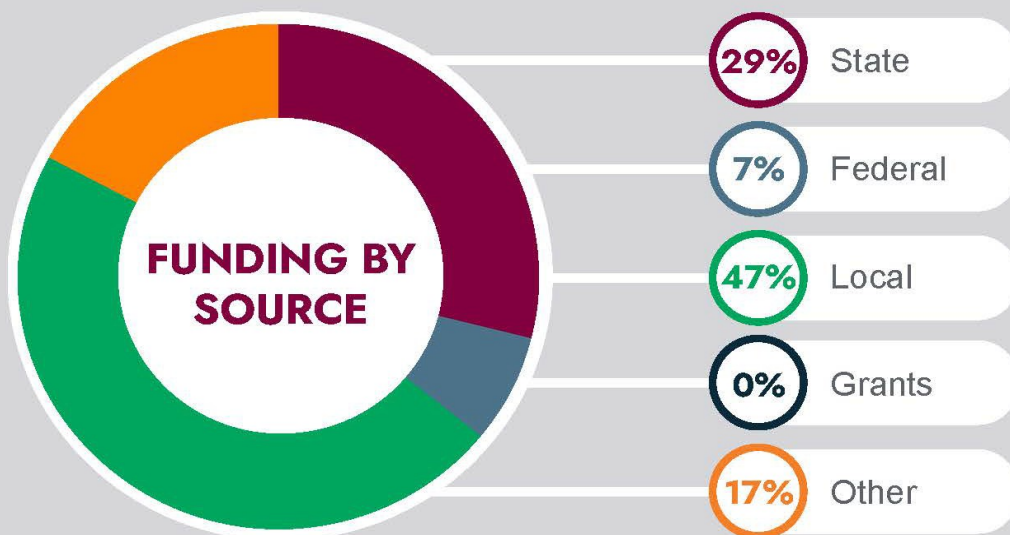
215 W. Main St., Suite C, Stanley, VA 22851
page.ext.vt.edu | 540-778-5794



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PAGE COUNTY BY THE NUMBERS

TOTAL FUNDING: \$264,778



PAGE POSITIONS

In Progress
Extension Agent
4-H Youth Development

In Progress
Extension Agent
Agriculture and Natural Resources



\$2.55

RETURN ON INVESTMENT FOR EVERY
DOLLAR INVESTED BY THE COUNTY
IN PAGE COUNTY

\$175,515

VALUE OF EXTENSION
VOLUNTEER HOURS IN
PAGE COUNTY



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STORIES OF IMPACT

The 2020 quarantine cancelled all in-person 4-H programs and camps, challenging us to create new ways to reach children. The 4-H agent, 4-H program assistant, and 4-H intern created six 4-H Day-Camp-in-a-Box hands-on programs for ages 5-12 to carry out at home. Topics included cooking, STEM, nature, recycling, and crafts.

Due to family financial struggles, we provided scholarships to 105 of the 187 children who participated. Each camper received a box with lesson plans, all supplies needed, and a daily snack. Brief morning Zoom energizer meetings were held daily. "How-to" videos for all lessons were posted on Flipgrid, and campers were invited to post their own videos, which were shared in a final showcase Zoom meeting for all campers. Evaluations were positive and indicated that most campers were new to 4-H and would like this program to continue after the pandemic.



Hannah Orndorff, 4-H intern, delivers a 4-H Day-Camp-in-a-Box to a parent.

AGENTS OF POSITIVE CHANGE

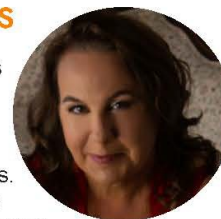
"I work with a national team that developed a standard operating procedure for managing animal carcasses during diseases and natural disasters. This SOP was part of the solution for managing livestock that were unable to go to processing due to COVID-19 related supply chain disruptions."



Bobby Clark
Senior Extension Agent
Agriculture and Natural Resources

COMMUNITY VOICES

"I just finished the VCE class series called Managing Your Money, and it was informative, eye opening, and full of valuable resources. If you are questioning where all your money is going or asking where you can get more money, this class is for you!"



Staci Ruark
Participant, Managing Your Money

GET IN TOUCH

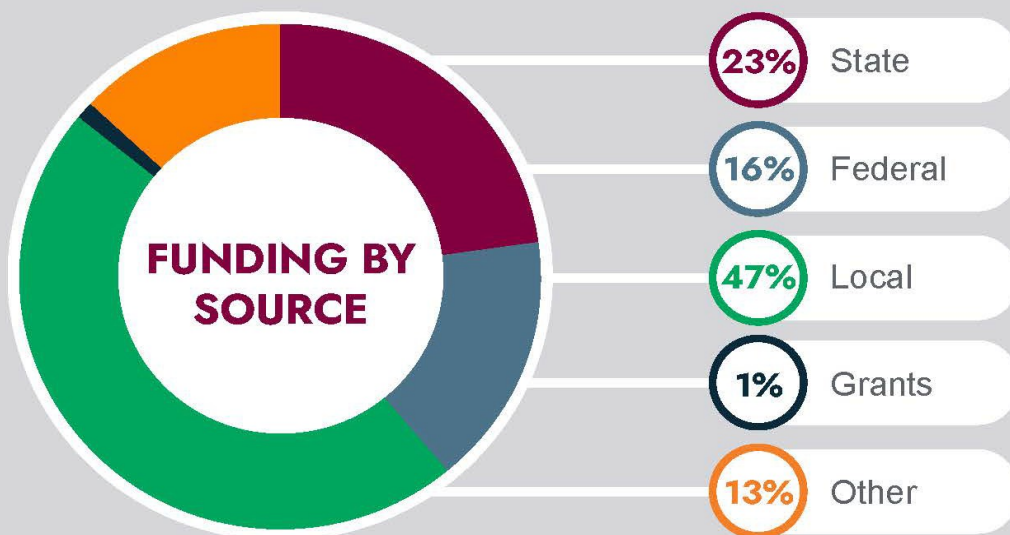
600 N. Main St., Suite 100, Woodstock, VA 22664
shenandoah.ext.vt.edu | 540-459-6140



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SHENANDOAH COUNTY BY THE NUMBERS

TOTAL FUNDING: \$390,971



SHENANDOAH POSITIONS

Bobby Clark
Extension Agent, Agriculture and
Natural Resources

Carol Nansel
Extension Agent, 4-H Youth
Development



\$2.65

RETURN ON INVESTMENT FOR EVERY
DOLLAR INVESTED BY THE COUNTY
IN SHENANDOAH COUNTY

\$279,259

VALUE OF EXTENSION
VOLUNTEER HOURS IN
SHENANDOAH COUNTY



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STORIES OF IMPACT

The Skyline Stockmen's Contest for 4-H and FFA members assesses comprehensive livestock knowledge. Youth judge classes of beef, sheep, hogs, goats, steaks, and hay and identify livestock breeds, feeds, cuts of meat, and equipment. They compete both individually and in teams, giving them the opportunity to practice their evaluation skills before the state contests.

The participation in 2020 was the second highest ever, educating 160 youth from Virginia and West Virginia. One of the coaches said, "I love this contest. It does a wonderful job in preparing students for the state contest as well as many other contests. I often use this contest as a tie breaker or a way for students to prove they are ready to move on to a new level of competition."



Skyline Stockmen's Contest 2019.

AGENTS OF POSITIVE CHANGE

"Our Managing Your Money series addresses important financial skills, including understanding credit, establishing a spending and savings plan, banking, maintaining insurance, record-keeping, and getting out of debt. By teaching people to take control of their finances and live within their means, we are strengthening Warren County families through financial education."



Karen Poff
Senior Extension Agent
Family and Consumer Sciences

COMMUNITY VOICES

"Extension agent Corey Childs helped me connect all my Beginning Veteran Farmer Training so I could create a solid integrated livestock and produce farm business plan. I finally see logical steps I must take to attain my farm's vision."



Rich Faucher
Owner
Faucher Farms

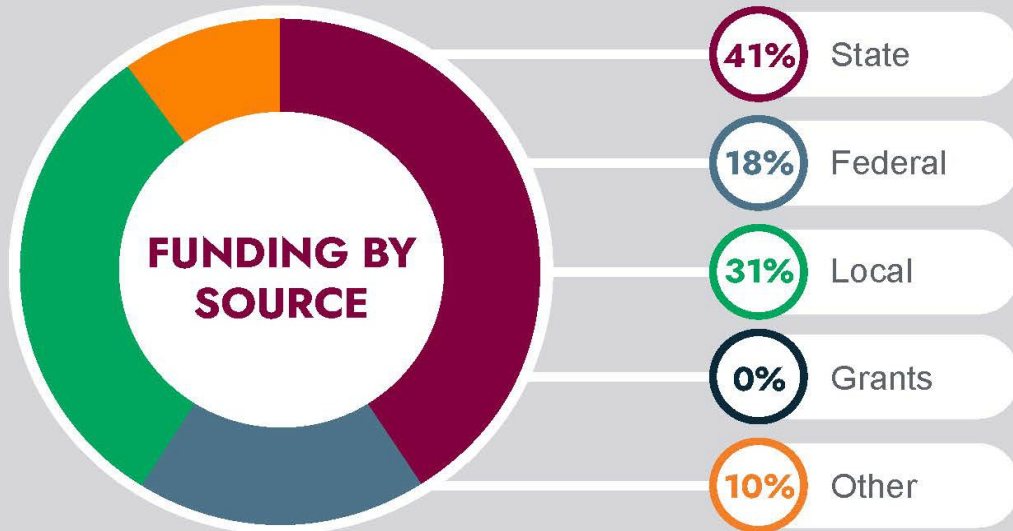
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220 N. Commerce Ave., Suite 500, Front Royal, VA 22630
warren.ext.vt.edu | 540-635-4549 |

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WARREN COUNTY BY THE NUMBERS

TOTAL FUNDING: \$386,003



WARREN POSITIONS

Corey Childs
Extension Agent
Agriculture and Natural Resources

Karen Poff
Extension Agent
Family and Consumer Sciences



RETURN ON INVESTMENT FOR EVERY
DOLLAR INVESTED BY THE COUNTY
IN WARREN COUNTY

\$84,252

VALUE OF EXTENSION
VOLUNTEER HOURS IN
WARREN COUNTY



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ALSON H. SMITH JR.

Agricultural Research and Extension Center



Sherif Sherif's lab, in collaboration with AgroSpheres, Inc. and the University of Virginia, has examined the efficacy of a novel class of bio-fungicides to manage grey mold disease in strawberry. *Botrytis cinerea* is the fungal pathogen that causes gray mold disease in more than 1,000 plant species, including many fruits and leafy vegetables, causing more than \$10 billion of annual losses worldwide. This fungus is of increasing commercial interest due to its ability to mutate quickly and the overreliance on synthetic fungicides to manage it. AgroSpheres, Inc., a startup company based in Charlottesville, Virginia, has introduced novel biotechnology called AgriCells that can deliver RNA molecules to invading fungal pathogens.

Using laboratory and greenhouse facilities and equipment at the AREC, Sherif and his research team have demonstrated that AGRNAs can significantly reduce fungal growth and prevent grey mold disease progression in strawberries for at least 12 days after application. The collaborative teams also showed that AGRNAs have a high degree of species specificity and are resistant to degradation by RNases and amenable to large-scale production and open-field applications.

Gray mold disease symptoms development on strawberry fruits sprayed with water, AgriCells (AGRNA1 & 2) targeting vital genes of *Botrytis cinerea* fungus after 5 days of inoculation with the fungus.

PARTNER WITH US

595 Laurel Grove Road
Winchester, Virginia
(540) 869-2560

<https://www.arec.vaes.vt.edu/u/arec/alson-h-smith>

FACEBOOK

"My lab explores novel and alternative means of improving tree fruit resiliency to both biotic and abiotic threats, including spring frost and diseases. The industry partnership with AgroSpheres illustrates our commitment to finding fruit industry solutions that embrace the SmartFarm Innovation Initiative and support the needs of start-up, Virginia-based enterprises"



SHERIF SHERIF
ASSISTANT PROFESSOR, TREE FRUIT
HORTICULTURE EXTENSION SPECIALIST

"Tony Wolf and other specialists at the AHS Jr. AREC organized and partnered with Virginia Vineyards Association leadership in 2020 to present a series of well-attended, virtual vineyard meetings, in which the impact of spring frosts and other seasonable vineyard topics were discussed. These educational meetings kept our membership up-to-date with the necessary information in an unusual growing season. The feedback from our membership has been extremely positive."



NATE WALSH
PRESIDENT, VIRGINIA VINEYARDS ASSOCIATION

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.



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VIRGINIA AGRICULTURAL
EXPERIMENT STATION
VIRGINIA TECH



VT/0121/AREC-265



Northern Virginia 4-H Educational Center

***600 4-H Center Drive
Front Royal, VA 22630
(540) 635-7171***

Our Mission

Since 1981, the Northern Virginia 4-H Educational Center has offered year-round, research-based programming to the youth and families of Northern Virginia. In addition to its acclaimed camps, the Center hosts a variety of corporate retreats, festivals, team building programs, and outdoor recreation.

Our beautiful setting in Harmony Hollow, just outside Front Royal, Virginia will leave you invigorated and inspired.

Home to acclaimed year-round camps and educational programs, we provide facilities and services to groups seeking a relaxed, economical retreat experience. Located on 229 acres in the Blue Ridge Mountains, the Center was deeded to Virginia Tech in 1976 and is the site of the historic U.S. Cavalry Remount Center. We are just 1 hour from the suburbs of Northern Virginia and Dulles International Airport and 1.5 hours from Washington DC!

1. Mission

1. The Northern Virginia 4-H Educational and Conference Center's mission is to facilitate proven experiential learning programs for youth, families, and adults that educate, inspire and connect.

2. Vision

1. The Center's vision is to improve all aspects of the world in which we live, work and play through recreation, education, leadership, and life skill development. Our vision is put into action through the support of diverse communities, impactful stewardship and the creation of meaningful relationships with those around us, making the 4-H Center a truly sustainable organization.

3. Core Values

1. Educate, Inspire, Connect



Program Impacts



TITLE: 2020 Spotted Lanternfly Outreach in Virginia

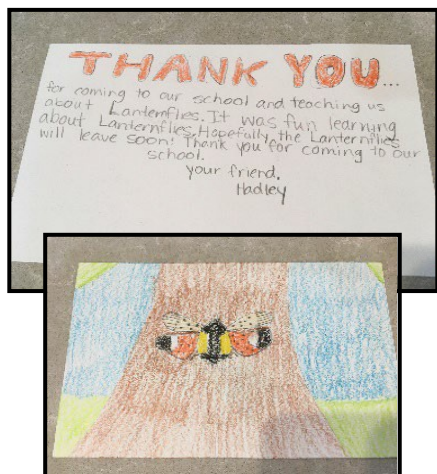
RELEVANCE – A very serious pest of agricultural crops, forest products, home landscapes, and general business commerce, the spotted lanternfly (SLF), *Lycorma delicatula*, was detected in Frederick County, Virginia, on January 10, 2018. Initial infestation was determined to comprise about one square mile in Winchester City and Frederick County. At the end of 2020, the invasive insect species is now known to cover over 140 square miles across five counties. Spotted lanternfly is a fulgorid plant bug that has been expanding its range in Asia, and most recently North America. SLF feeds on more than 100 host plant species. Vineyards, orchards, and the forest industry are at risk. Excessive feeding on the vascular system of grape vines, fruit trees, and hardwoods reduces yield, quality, and can ultimately lead to plant death. Spotted lanternfly has the

capability to aggregate in very high numbers on a single host tree. These high numbers of large insects can elicit fear and use of many inappropriate chemicals and other management tools.

RESPONSE – Specialists and Agents spoke throughout the state, regionally, and nationally about spotted lanternfly to raise the awareness and to slow the spread of this invasive insect. Seventy-eight presentations have been delivered to a total of 2,756 individuals. Audiences included researchers, Extension Agents in Virginia and North Carolina, grower groups and farmers, civic groups, state and local elected officials, volunteers, state and local government workers, pesticide applicators, businessmen/businesswomen and employees, non-profit organizations, and the general public. Social media was used regularly to post updates and seasonal information related to the phenology of the pest, host species, geographic locations found, and timely best management information. Additionally, nine media interviews were conducted for radio, television, and newsprint.

Volunteer Monitoring: Due to COVID limitations, online training and five recorded modules were developed to ready willing volunteers for 2020, the third year of volunteer monitoring in Virginia (<https://www.ento.vt.edu/idlab/SpottedLanternfly.html>). Materials were distributed in person at an outside meeting that was held on July 22, 2020 for local volunteers. Despite a late start to trapping due to the coronavirus pandemic, 1,356 unique observations were made by 46 detectors (Specialists, Agents, and volunteers) in 37 counties. Public reports also came from the public via social media, eXtension, email, phone, and in-person to the Insect ID Lab and through six VCE offices. In addition to transportation intercepts, breeding spotted lanternfly infestations were found in the counties of Augusta, Clarke, Frederick, Shenandoah, and Warren as well as the City of Winchester. The remaining negative observations help serve to delimit the Virginia infestation.

2020 RESULTS – Community members are being reached, and awareness is increasing regarding this invasive insect species. VCE-Northern-Shenandoah-Valley-Agriculture-and-Natural-Resources Facebook posts have reached more than 500,000 individuals regarding spotted lanternfly in 2020. Over 1,600 SLF reports with requests for best management practices have been made to the Virginia Tech Insect ID Lab and to Virginia Cooperative Extension-Frederick County. Residents reporting are often aware of the pest, and over 98% of spotted lanternfly reports are correctly identified by the reporting individual. Reports and scouting led to one new county population discovery along with multiple transportation intercepts throughout the state.



Following a SLF presentation, 98% of the audience comprised of 181 pesticide applicators (142 completing a post-program evaluation), stated they are now able to identify spotted lanternfly and 94% will scout for and report for SLF findings. The following comments were received from middle school youth following a presentation in Winchester: “I learned that lanternflies are an invasive species, and they die off in winter but lay their eggs before winter and then the babies hatch in the spring”; “I learned they don’t bite, they are bad, they are colorful”; “I learned you should kill them and report them”; “I Learned: 1. The types of trees lantern bugs don’t go on, 2. Females bigger than males, 3. They are everywhere”; “I learned that their egg masses have 20-30 of those bugs. And that the male has a black thing on its bum and the female has a red thing on its bum. I also wanted to tell you that I have killed 30 bugs”.



Title: 2020 Consumer Horticulture and Environmental Programming in the Northern Shenandoah Valley

RELEVANCE - 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.

RESPONSE - In 2020, 30 additional volunteers participated in the EMG training program in Winchester. Extension agents, specialists, and veteran EMGs all worked to provide quality training to this new cohort of volunteers via hybrid in-person labs and classes as well as online lectures and modules. Following training, EMGs began volunteering to employ their new training in educational projects across the area.

In 2020, EMGs participated in two radio interviews and three interviews for newspaper articles. Despite the coronavirus pandemic, NSV EMGs altered and reworked to conduct 52 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/>).

RESULTS - 30 trainees participated in EMG trainings and joined forces with the 134 currently active EMGs, Emeritus, Interns, and Trainees in the NSV. In 2020, there were 164 volunteers working on behalf of VCE providing service and educational programming to 313,091 contacts. In the course of working with NSV citizens, EMGs reported 12,133.7 volunteer and continuing education hours. The volunteer time equated to more than six full-time equivalents. This means that collectively, VCE had an additional six full-time, non-paid, staff disseminating best practices in the NSV. The economic value of the reported volunteer time is \$345,325.10 (based on an hourly rate for Virginia of \$28.46 from the independent sector), a tremendous in-kind contribution and return on investment to the NSV.



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.





Virginia Cooperative Extension Master Gardener Program Northern Shenandoah Valley

WHAT IS THE EXTENSION MASTER GARDENER PROGRAM?

Mission: Sharing Knowledge and Empowering Communities
Extension Master Gardeners (EMG) are trained volunteer educators who work within their local communities to promote sound horticultural practices. The Extension Master Gardener program delivers the horticultural resources of Virginia's land-grant universities: Virginia Tech and Virginia State University.

Five Year Impact: 2016-2020 Northern Shenandoah Valley

136 Master Gardeners
18 Master Gardener Interns
10 Emeritus Master Gardeners



WHO DROVE

410,141 miles

AND MADE



639,253 educational
contacts



CONTRIBUTING A TOTAL OF

72,451 volunteer and continuing
VALUED AT education hours

\$1,969,248.60*

TO CLARKE, PAGE, FREDERICK, SHENANDOAH, AND WARREN COUNTIES

*Based on Independent Sector Value of Volunteer Hours by State by Year

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Title: Northern Shenandoah Valley Pesticide Safety Education Program

RELEVANCE - The federal and state pesticide laws require applicators to be certified to use restricted use pesticides. In addition, VA 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 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.

RESPONSE - In January 2020, PD7 ANR Agents offered the annual commercial pesticide recertification workshop at the 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 February, a full-day core training followed by offering commercial, private, and registered technician examinations at the Alton H. Smith, Jr., AREC in Winchester. In fall 2020, agents conducted eight VDACS approved re-certification programs in pesticide safety and IPM in Berryville, Woodstock, and Stanley. Collaborating with Central Shenandoah Valley Agents to better accommodate private applicators in the midst of the coronavirus pandemic, the re-certification was also made available online and via printed materials. Additionally, private applicator recertifications were offered by PD7 Agents at the Winchester Area Fruit School in February and the Mid Atlantic Fruit and Vegetable Conference in Hershey, PA in January.

RESULTS - During 2020, 96 private pesticide applicators and 187 commercial pesticide applicators were trained for recertification in PD7. The following numbers of individuals were trained and tested for initial pesticide applicator training: 25 commercial core, 9 private core, 18 registered technician core, and 22 1A Agriculture Plant. Of the 181 attendees at the 2020 commercial workshop, 142 (78%) completed a written survey supplied at the end of the day following the course with the following results:

- 99% know what they need to do to comply with state and federal laws and regulations
- 92% learned more about proper use of applicator equipment
- 98% read pesticide labels and use required PPE
- 94% rated the program as good-excellent and provided comments such as: *“good overview of invasive species and common issues we face in the industry”*; *“this was a very well organized and educational recertification class”*; *“provided me knowledge I need to work safely”*; *“overall it was the best recertification class I have attended”*; critical comments to learn from came from 8% of comments and include: *“a little redundant”*; *“the bit about aquatic weed management didn’t apply, should have been a breakout session”*
- 98% stated they are now able to identify spotted lanternfly and 94% will scout for and report SLF findings
- 95% acquired a better understanding of how water quality can impact spray applications
- 94% stated they learned about brown marmorated stink bug biological control agent, Samurai wasp



Additional comments about lessons learned and plans to implement are captured in these comments: *“change mowing height of turfgrass”*; *“wear proper PPE no matter what”*; *“will test pH and water quality”*.



TITLE: 2020 Volunteer Monitoring of the Spotted Lanternfly

RELEVANCE – A very serious pest of agricultural crops, forest products, home landscapes, and general business commerce, the spotted lanternfly (SLF), *Lycorma delicatula*, was detected in Frederick County, Virginia, on January 10, 2018. Initial infestation was determined to comprise about one square mile in Winchester City and Frederick County. At the end of 2020, the invasive insect species is now known to cover over 140 square miles across five counties. Spotted lanternfly is a fulgorid plant bug that has been expanding its range in Asia, and most recently North America. SLF feeds on more than 100 host plant species. Vineyards, orchards, and the forest industry are at risk. Excessive feeding on the vascular system of grape vines, fruit trees, and hardwoods reduces yield, quality, and can ultimately lead to plant death. Spotted lanternfly can be detected by using traps on Tree of Heaven, *Ailanthus altissima*, and is easily identified, thus making it a good candidate for volunteer science detection. Modeled after the Pennsylvania efforts at the site of the original North American infestation, a successful monitoring program has been used in Virginia for three years.



RESPONSE – Extension Master Gardeners, Master Naturalists, Virginia Department of Forestry staff, park employees, and local and county government employees from throughout the state, but predominately in the northern regions of Virginia, expressed interest in surveying for this new pest. Over the past three years, trapping efforts have adjusted to minimize non-target bycatch and to protect rusty patched bumble bee, *Bombus affinis*, a protected species by EPA endangered Species Act. Supplies were purchased for trapping SLF and an app was set for the volunteers to report both positive and negative findings. Due to COVID limitations in 2020, online training and five recorded modules were developed to ready willing volunteers (<https://www.ento.vt.edu/idlab/SpottedLanternfly.html>). Materials were distributed in person at an outside meeting that was held on July 22, 2020 for lead volunteers.

Despite a late start to trapping, due to the coronavirus pandemic, 1,356 unique observations were made by 46 detectors (Specialists, Agents, and volunteers) in 37 counties. Public reports also came from the public via social media, eXtension, email, phone, and in-person to the Insect ID Lab and through six VCE offices. In addition to transportation intercepts, breeding spotted lanternfly infestations were found in the counties of Augusta, Clarke, Frederick, Shenandoah, and Warren as well

2020 RESULTS – Coordinating efforts with Virginia Department of Agriculture and Consumer Services Plant Industry Services, spotted lanternfly is delimited to the counties of Augusta, Clarke, Frederick, Shenandoah, and Warren as well as the City of Winchester. Trained individuals have searched for this invasive pest, using approved methods including banding and trapping. Counties where it has not been found by trapping can be listed on USDA maps as apparently free of Spotted Lanternfly. More eyes looking for Spotted Lanternfly mean early detection in new locations and spread is slowed by volunteer outreach informing the public about pathways of potential movement and human assisted spread. Eager and highly trained volunteers conducted surveys that provided valuable information for farmers and businesses that ship in and out of Virginia. The survey gives farmers an early warning system for the arrival of the spotted lanternfly in their area.





Title: 2020 Enhancing Farm Profitability and Sustainability of Small Ruminant Production in the Northern Shenandoah Valley

RELEVANCE – This educational program is designed to be a continuous multi-year effort to help educate small ruminant producers, build coalitions, and develop marketing channels for Virginia producers. Area small ruminant producers are considered a small producer as flock or herd sizes average less than 25 animals. Therefore, these small flock producers cannot take advantage of many marketing opportunities or opportunities based on “economy of scale” to improve gross farm gate receipts and total revenue. Although local demand for sheep and goats is high in the region, many producers do not feel they have a way to reach perspective buyers. The direct off farm sales of sheep and goats has increased in 2020 due to the

periodic shortages of meat available in the supermarket meat case related to harvest slow-downs directly related to COVID-19, we will see if this creates long term trends. Regional producer groups, economic development professionals, and consumers have identified this as a limiting factor in the expansion of small ruminants in the region.

RESPONSE – The situation in 2020 was impacted by the COVID-19 virus and its impact on activities, events, and how people can participate. Educational program offerings focused on a combination of in person and virtual opportunities for the first time. They focused on providing information or providing organization support to local producer groups to organize marketing opportunities that enabled producers to maximize the value of their livestock and crops through the development of value added “niche” and group marketing opportunities. Provided enterprise and ration budgets to identify ways to reduce feed and other production costs. I collaborated with VDACS, the Old Dominion Livestock Producers Association, and Farmers Livestock in Winchester, VA to provide State Graded Sheep and Goats Sales for regional producers. I also co-managed the Virginia Bred Ewe Sale and the Northern Virginia Area Wool Pool. This allows wool producers to cover shearing costs and also avoid disposal of the wool in ways that have negative environmental impact or fill landfill space.



RESULTS – State Graded Sheep and Goat marketing opportunities where producers marketed over 1,876 head of sheep and goats. The average price received by producers increased 2-22 cents per pound higher than corresponding in state in-barn weekly sales. Due to the demand for local produced meat, some producers increased the number they sold off the farm. I graded and helped advertise the rams on VA Ram Test where 48 rams sold virtually and averaged \$592, while 20 ewe lambs in the Commercial Ewe Development Program sold for \$313. I also served as Co-Chairman for the VSPA Fall Bred Ewe and Lamb Sale which was also sold virtually and 24 ewes averaged \$699 and sold into 9 states. The change to a virtual sale format did not hurt sale averages as they were all within 10% of the 5-year averages. The Northern Virginia Area Wool Pool was held, and 5,690 pounds of raw wool was collected to be sold on a grade and yield basis allowing producers to receive maximum value.

Title: Increasing No-Till to Improve Farm Profitability and Enhance Water Quality

RELEVANCE - When farmers plant crops without plowing/disking, it is called “no-till.” Compared to conventionally planted crops (i.e. plowing/disking prior to planting), no-till is better for water quality because it reduces erosion and crop nutrient loss. No-till is more profitable because there is a higher yield potential and slightly lower input cost.



However, when farmers plant corn or soybeans no-till, slugs often feed on the emerging seedlings and cause significant stand loss. Farmers report that damage from slug feeding is one of the most significant factors preventing them from adopting no-till. There is 38,000 acres of corn and soybean in the Northern Shenandoah Valley, and at least 15,000 of these acres are planted using conventional tillage practices

RESPONSE - For the past decade, Extension Agent Bobby Clark has been diligently working to address this issue. He has scouted at least 1,000 acres each year to teach farmers how to properly identify slug damage; worked with farmers to complete 12 on-farm demonstrations to teach farmers slug management strategies; made presentations at a multitude of winter meetings; hosted multiple on-farm research projects; and collaborated with researchers from across the mid-Atlantic region. This work has informed farmers about current slug management technologies and resulted in new knowledge.

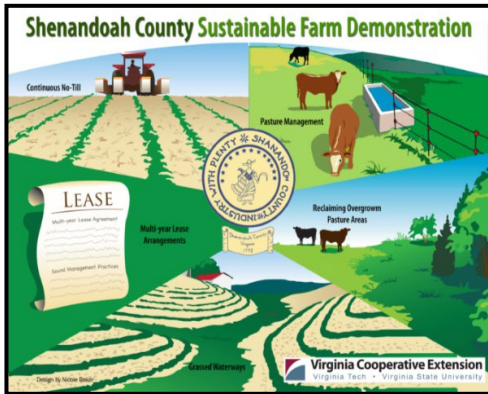


Through constant interaction with farmers, we learned that almost every farmer was broadcast applying insecticides to crops. Although Extension had not been recommending this practice, farmers believed it was needed. Data, from the 10+ years of field scouting, supported the recommendation that this insecticide application was not needed. Also, the on-farm research revealed there is a healthy native population of

beneficial insects in the Shenandoah Valley that would feed on the slugs and that these insecticides were harming the population of beneficials.

RESULT - As a result of Bobby's efforts, many farmers have learned management strategies that are enabling them to continue planting their crops no-till. The portion of crops planted no-till has remained steady at 60-70 percent. A summary of five long-term no-till farmers (representing 2,535 acres) showed that they likely netted \$30 more per acre with their no-till practices compared to their anticipated outcome if they would have disked all of their land. Secondly, almost every farmer in the Northern Shenandoah Valley has quit applying insecticides with their pre-plant broadcast spray. Data shows that eliminating the insecticides is likely reducing the number of fields experiencing yield loss (or needing to be re-planted) due to slug injury by 10% per year.

The combined benefit of farmers continuing to no-till and eliminating the use of pre-plant broadcast insecticide is sustaining/improving farm profitability by over \$500,000 per year. A long-term goal of this effort is to increase the portion of corn and soybean acres no-tilled.



Title: Shenandoah County Sustainable Farm Demonstration

RELEVANCE - There is 150,000 acres of rented farmland in the Northern Shenandoah Valley. This farmland is an important part of Virginia's food production system.

Each year, Extension Agents receive dozens of requests from landowners for information about how to rent their farmland to area farmers. Most landowners want environmentally sound farming practices, and they have personal goals associated with their land. A problem with rented land is that it is difficult for farmers or landowners to justify making long-term investments in the land. As a result, rented farmland often becomes

unproductive due to excessive erosion, poor fertility, pastures overgrown with brush, fence and building disrepair or related problems. Often farmland becomes in such a state of disrepair that farmers are unwilling to lease it. This type of scenario is repeated hundreds of times across the Shenandoah Valley. The land becomes lost to production agriculture, and often landowners become dissatisfied with land ownership.

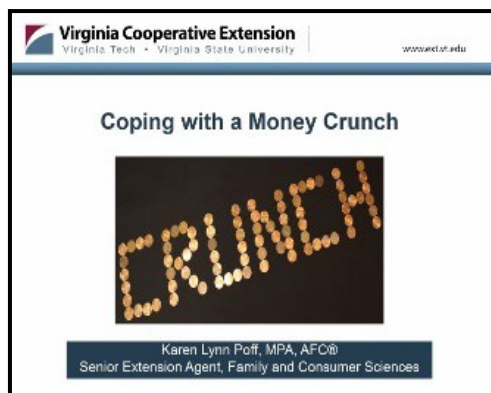
RESPONSE - Shenandoah County Farm was a typical example of this type of farm. To address this issue, we decided to create the Shenandoah County Sustainable Farm Demonstration. Our purpose was to show landowners and farmers how a farm could be revitalized in a manner that was environmentally sound, profitable for a farmer, and all improvements would be at no net cost to the landowner. The design of the lease between the farmer and the landowner (Shenandoah County) is part of the demonstration.

RESULT - We are eight years into this 10-year demonstration. We have completed all of the planned improvements to the farmland and have also been able to make significant improvements to farm buildings. By the end of this lease, current projections are the landowner (Shenandoah County) will have spent \$66,270 and received \$68,000 in rental. Thus, achieving the goal of making all of the desired improvements at no net cost to the landowner. A pre and post BMP assessment using the Chesapeake Bay Model shows the improvements to the county farm will result in an annual nitrogen reduction of 1,745 pounds, a phosphorus reduction of 107 pounds, and a sediment reduction of 101 tons. During the eight years, the farmer has been fortunate to grow bountiful crops and has had every opportunity to be profitable.

Results have been shared with more than 1,000 landowners in both group and individual meetings. Revised farm leases, that stem from this program, often include a multiyear lease with specific farm improvement goals, they address landowner goals, and enable farmers.



Title: 2020 “Coping with a Money Crunch” Webinar Helps Individuals and Families Manage the Financial Hardships Caused by COVID-19



RELEVANCE - The COVID-19 Pandemic created financial hardships for families around the nation. Due to the economic shutdown and the effects of unexpected illness, layoffs, and school closings, individuals and families were suddenly without sufficient income to make ends meet. Many of these were people who had previously been financially self-sufficient and who lacked the necessary skills to navigate community services systems, manage money effectively, prioritize needs, and negotiate with creditors.

RESPONSE - The “Coping with a Money Crunch” webinar provided a virtual opportunity for participants to proactively confront their situation. The two-hour webinar explained how to access immediate options, such as economic impact payments, pandemic unemployment assistance, the

paycheck protection program, and public assistance programs, as well as how to create a “crunch” spending plan to guide decisions. The webinar also encouraged participants to use all available resources, narrow priorities, and contact creditors to negotiate pandemic relief. Finally, the webinar outlined COVID-19 scams and predatory loan offers that could harm consumers, in addition to covering less risky alternatives. Participants could attend the webinar by phone, viewing a copy of the slides received in an e-mail, or through the Zoom application on their smartphone, tablet, or computer. Following the webinar, participants received a file by e-mail containing additional handouts and resources.

RESULTS - From May through December, 21 sessions were held reaching a total of 70 participants. Of these, 26 completed the end-of-session evaluation. Participants reported a variety of behavior changes, such as acting on immediate options, revising or creating a spending plan, exploring additional resources to make ends meet, narrowing priorities, contacting creditors, and avoiding scams and high-cost loans. Of those responding, 9 (35%) planned to take five or more recommended actions; 21 (81%) planned to take three or more; and 26 (100%) planned to take at least one recommended action. The three-month follow-up evaluation demonstrated that many of them followed through on their action plans. Of the 12 people who responded, 10 (83%) indicated that they had taken steps to improve their financial situation. Responses showed that 6 (50%) had acted on immediate options, 5 (42%) had revised or created a spending plan, 8 (67%) had explored additional resources to make ends meet, 10 (83%) had narrowed their priorities, 1 (8%) had contacted creditors, and 8 (67%) had used the information to avoid scams and high-cost loans. For the question about contacting creditors, 5 (42%) indicated the question did not apply to them. One participant commented, *“The webinar was extremely helpful and easy to follow, with many great tips on finances, especially categorizing money obligations.”* Another said, *“I will not use credit cards for things that will be gone before it's paid off.”* And another wrote, *“I will stick with my spending plan/budget by utilizing a calendar and realizing it is subject to change.”* Respondents also estimated that they would share the information with a total of 540 additional people.



Title: Gardening for Health 2020

RELEVANCE - Page County has a poverty rate of 18.3% countywide, and Luray Elementary School has a 64% free and reduced meal reimbursement rate. In Page County, the child food insecurity rate is 18.7% and the overall food insecurity rate is 11.7%.



RESPONSE - The Garden to Go mini-grant was offered by the Virginia Family Nutrition Program as an alternative way to do community garden programs during the COVID-19 pandemic. This program increased access to fresh vegetables and taught children about where their food comes from. The Garden to Go team in Page County received \$250 for soil, pots, and seedlings to go home with 40 children at Luray Elementary School's 21st Century After School Program. I partnered with Page Alliance for Community Action (PACA), our local Healthy Community Action Team, as well as with Page County Public Schools Department of Nutritional Services and the Luray Elementary School 21st Century Community Learning Center to put together the kits and distribute them during meal distribution. In addition to The Gardens to Go, a community garden was also planted at the Rural Health Clinic/Dialysis Center in Stanley. Anyone was welcome to harvest and work in the garden. Some of the produce was used in the school meals that were delivered around the county.



RESULTS - From this program, 40 children at Luray Elementary School received their cherry tomato garden to-go kit. They also received recipes on how to use cherry tomatoes as well as how to care for the plants. In collaboration with PACA, nutrition education videos were put together for the Stanley Community Garden. These videos included build your own pasta, build your own popsicle, and a monster smoothie. These videos reached 474, 470, and 271 people respectively. With the help of Master Gardeners and other community members, the community garden harvested over 600 pounds of produce from the garden. The end of season harvest was donated to the Page One Pantry in Shenandoah.

Title: Shop Smart, Eat Smart 2020

RELEVANCE - In the Lord Fairfax Health District (which houses Page and Shenandoah Counties), 74% of adults are overweight or obese (FeedVA, 2020). In Page, 10.36% of the total population participates in SNAP (Supplemental Nutrition Assistance Program, formerly known as food stamps) (FeedVA, 2020). In Shenandoah County, 10.69% of the population participates in SNAP (FeedVA, 2020). The majority of school's qualifying for FNP programs are at the southern end of the county. FNP has designed a 2-phase healthy food retail program called Shop Smart, Eat Smart (SSES) where SNAP-Ed Agents partner with food stores in low-income areas or stores with high SNAP redemption. Strategies I have implemented in phase 1 include in-store marketing and consumer education and engagement. The goal of the program is to encourage purchases of healthy food among SNAP participants, thus increasing the demand for healthy foods. Opportunities in phase 2 will support inventory changes that add healthy food options to SNAP-authorized retail stores. There are also plans for phase 2 to include deepening the partnership to include other community partners as well.



RESPONSE - I have a standing Memorandum of Understanding with the Shoppers Value store in Luray to participate in SSES. The retailers have decided to implement in-store marketing including shelf labels with messages or nutrition information to highlight healthy foods and beverages, and direct education and customer engagement through food demonstrations with nutrition education. In 2020, I onboarded a second retail store the Jon Henry General Store in New Market. The Jon Henry General Store is the 4th retail partner of Virginia Fresh Match and has successfully supplied SNAP shoppers with half off fresh produce. At the Jon Henry General Store in-store marketing and direct virtual education through food demonstrations have been implemented.



RESULTS - I conducted monthly food demonstrations at Shoppers Value up until March when the pandemic affected this work. At the Jon Henry General Store, I pivoted to virtual food demonstrations to encourage healthy items and shared these via the Family Nutrition Program Facebook as well as the store's social media. The virtual food demonstrations for a side salad, build your own omelet, and pumpkin recipes reached 2751, 1200, and 985 people respectively. Recipe tearaway cards have been placed at both retail locations and shelf talkers have been placed on healthy items as well.

Title: Skyline Stockmen's Contest Increases Confidence and Preparedness in Youth Participants

RELEVANCE - Positive youth development focuses on building life skills that youth need to be successful contributing members of society. Youth involved in the contest successfully gain valuable life skills including critical thinking, problem solving, and decision making. These skills are important to their career and community success. Youth involved in these educational contests grow and utilize all of these important life skills while networking with other youth who have similar interests and career goals. The contests also provide opportunities for youth to gain a better understanding of the industry and how to evaluate the quality of the products they will be working with in the future. The contest provides youth an opportunity to practice their skills and gain confidence prior to participation at the state and national level contests.

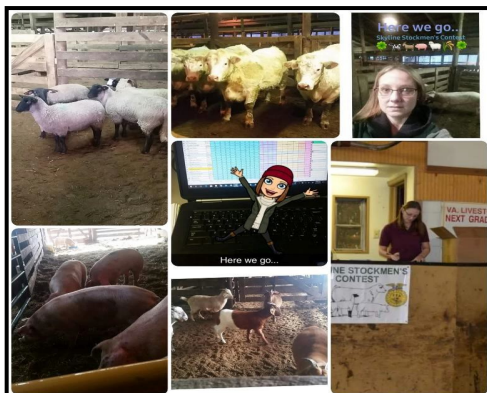


RESPONSE – Youth, involved in the Virginia 4-H and FFA programs, participated in the Skyline Stockmen's Contest that was coordinated and implemented by the Warren County Extension Office. In these events, youth judge classes of four individual, same-species, animals, a class of steaks and hay; identify breeds of livestock, feeds, cuts of meat, and equipment used in the livestock/poultry industries. They also are given the opportunity to identify animal by-products. These contests provide an opportunity for youth to compete individually, as well as with other individuals for team awards. Youth participating in this contest are given the opportunity to practice their evaluation skills prior to the state contests.

RESULTS - In 2020, 160 youth competed in the Skyline Stockmen's Contest. The participation totals were slightly higher than previous years, and 2020 was the second largest participation year since starting in 2010. The Warren County 4-H Program had 27 youth participate in the contest. Youth competed from 11 counties in Virginia and two West Virginia counties. Twenty-three 4-H groups and eight FFA Chapters participated in this annual contest. Over \$2,600 in donations and sponsorships were received to help support this annual educational program. During this statewide contest, 138 youth were trained to receive their 2020 Youth for the Quality Care of Animals (YQCA) certification.

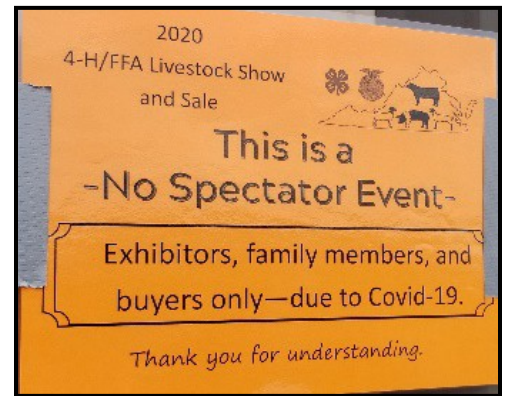
Ninety-four percent of the participants completed the survey at the completion of the contest. Eighty percent of those who completed the survey said that they benefited from attending the contest. One participant stated, *"Yes, every time I compete I feel it is very beneficial. I have been doing this contest since I was 9. I learning something each year."* Fifty-one percent stated that they learned something new because of this contest. Fifty percent of the survey results indicated that after participating in this contest, they felt better prepared to participate in future contests at the state level. One youth

stated, *"I got more experience and felt better prepared."* Another youth said, *"I enjoyed the contest; it's giving me more confidence for Block & Bridle."* Sixty-seven percent of the coaches and parents surveyed indicated that they believe their youth members (4-H and FFA) gained confidence by participating in this contest, and that they are better prepared to participate in future contests at the state level after competing in the Skyline Stockmen's Contest. One coach commented, *"I love this contest. It does a wonderful job in preparing students for the state contest as well as many other contests. I often use this contest as a tie breaker or a way for my students to prove they are ready to move on to a new level or competition."*



Title: 2020 Leadership in Planning a 4-H/FFA Livestock Show and Sale During a Pandemic

RELEVANCE - The National FFA Organization and the 4-H Youth Development program have spent considerable time developing, implementing, and evaluating activities whose specific intent was to develop and improve leadership skills in youth (Wingenbach, 1995). They incorporate livestock projects into their programming to reach youth with those interests in the hopes of achieving their ultimate vision of positive youth development, providing young people with skills necessary to become successful adults. A North Carolina Cooperative Extension Service publication states, "The purpose of 4-H and FFA youth livestock projects is to teach young people how to feed, fit, and show their animals. The more important purpose is to provide an opportunity for personal growth and development of the young person." (Adapted from Hammat, 1995, pg. 2).



RESPONSE - The 2020 Shenandoah County 4-H/FFA Livestock Program was underway when the COVID-19 pandemic struck and all in-person programming was suspended. The Livestock Executive Committee, that had been elected to plan and conduct the program, found themselves in a pickle as the pandemic protocols were established. Steer exhibitors already had their animals. Sheep, swine, goat, and dairy exhibitors were in the planning stages for their projects. With some parents out of work due to the pandemic, some livestock project members had to learn to make the hard financial decisions this year – could they afford to feed and take care of their project animal? Animal purchase prices and feeding programs were evaluated. Other families had essential workers who were away from the home more than normal, and those livestock project members had to decide if they could take care of their animals with less help than normal. All exhibitors learned what would happen if the youth livestock show and sale had to be conducted virtually. Livestock sale support from buyers was also in question as the pandemic affected some businesses and individuals differently than others. The Livestock Executive Committee needed to help advise youth as they learned and made the right decisions for themselves.

RESULTS - A few 4-H/FFA Livestock members made the decision to sell their project animals early due to the uncertainty of the show and sale and the amount of money they would have to invest in feed. Some of the members who would have raised sheep, goats, or swine either decided not to take those projects this year, or switched to rabbits or chickens because those projects need less of a financial investment. Other members chose a breeding animal to raise instead of a market animal this year. Overall livestock and exhibitor numbers at the Show and Sale were down by about 25%.

The 4-H/FFA Livestock Show and Sale Executive Committee, including four elected youth representatives, had to think outside the box and learn about the technology that might be needed to conduct the program either in-person or virtually. They participated in Zoom trainings and helped research different options to conduct the program following the COVID-19 protocols. The youth representatives showed tremendous growth in leadership skills as they helped the group of adults decide which direction to take. They also served as educators and advocates among their peers as changes were announced. The maturity with which they conducted themselves during a challenging time was notable. Six weeks before the 4-H/FFA Livestock



Show and Sale, we learned that the County Fair had been cancelled, but we had the approval to move forward with an in-person youth show and sale. Many more changes and adaptations followed, with the main goals were to conduct a safe event, prevent the spread of the virus, and help the exhibitors sell their project animals at least for market price. We were successful with all of the goals. There were no reported instances of illness during the 4-H/FFA Livestock Show and Sale. No one had to be asked to leave the grounds due to non-compliance with protocols. An inspector from the Health Department made two unannounced visits and found us to be in compliance, so we were not shut down or given any warnings. The 4-H/FFA Livestock Sale exceeded our expectations for sale prices and additional donations to exhibitors and to the committee for the additional expenses we had in conducting the 2020 program in the absence of the County Fair.

back to school

A Twig	B Pinecone	C Leaf	D Flower
E Seed	F Leaf	G Flower	H Seed
I Leaf	J Flower	K Seed	L Leaf
M Flower	N Seed	O Leaf	P Flower

A photograph of a small, circular fire pit. The pit is constructed from several flat, light-colored stones arranged in a ring on a patch of dirt and grass. A single stick lies horizontally across the center of the pit.

30



Title: 2020 Embryology During COVID-19

RELEVANCE - The 4-H Embryology program uses the Beginning of Life 4-H curriculum to teach students a better understanding of life and embryonic development. Frederick County 4-H uses fertilized chicken eggs as the educational topic for the study of embryology because it is an incredible mode of teaching embryonic development as the development takes place inside of an egg and is easily observed over the course of the short incubation period. The Beginning of Life curriculum covers a number of math, science, English, and life science SOLs, making it a useful teaching tool within the K-12 school system. The 4-H Embryology program teaches

students to teach responsibility and respect for living things, understand the components of an egg undergoing embryonic development, explain the topic of reproduction, and introduce students to scientific processes, in addition to other learning objectives. During 2020, the 4-H Embryology program was halted three days into incubation due to the COVID-19 pandemic, and as a result, we decided to change the program into a virtual format.



RESPONSE - As a response to the COVID-19 lockdown, I rescued the incubated eggs from the schools and placed them in homes of trusted individuals to care for and document the developmental process. Included in the modified Embryology program were daily egg updates, research-based publications, and videos showcasing significant changes in chick development. I created a Google Drive folder to share with the teachers and students so they could ask questions and witness the growth of the embryos through the developmental stages. I used the pictures and videos taken of the eggs and incubators, as well as information from the Beginning of Life 4-H curriculum, to discuss the Embryology project with the students from March 16, 2020 to April 1, 2020. I created a four-minute video explaining the importance of Day 18 in the embryonic developmental cycle and posted it to the Frederick County 4-H Facebook page, in addition to the Google Drive, so we could reach a larger audience. We ended the Embryology program with a livestream of the chicks hatching and updates on how many total chicks hatched.

RESULTS - The Day 18 video posted on the Frederick County 4-H Facebook Page reached 1,600 viewers and had over 250 post engagements. The students, that were in the Embryology program Google Drive, were ecstatic to be able to continue their class project, albeit in a virtual format. They checked in regularly and engaged in the pictures and videos posted by asking questions in the comment sections.

During 2020, we had two schools participate in the 4-H Embryology program:

- Redbud Run Elementary School, 115 students
- Gainesboro Elementary School, 69 students

We received positive feedback from parents and teachers who were grateful to us for providing an avenue for stress relief and a relatively normal learning experience for the students.

"Thank you for EVERYTHING you've done to help us - it's so unfortunate that COVID-19 got in the way of things, but several of my students were so excited to see the updates you shared online."



Meet the Staff Serving the Northern Shenandoah Valley

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