Shenandoah County Sustainable Farm Demonstration Progress Report March 2018

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Introduction

According to the Census of Agriculture, 34% of all farmland in Virginia is rented to farmers. This equates to almost 40,000 acres of Shenandoah County farmland. Rented farmland often becomes unproductive due to excessive erosion, poor fertility, overgrown pasture, fence disrepair, building disrepair, or related problems. Also, it is important for this land to be farmed in an environmentally-sound manner. Otherwise, we will not be able to maintain good water quality or achieve goals associated with the Chesapeake Bay. In short, the long term viability of agriculture in Shenandoah County and throughout Virginia is dependent upon this rented land being both productive and managed in an environmentally-sound manner.

The 160 acre Shenandoah County Farm was a typical example of this type of farm. There are about 55 acres of pasture on the farm. Cattle were using a pond and a small stream for their water supply. Cattle were continuously grazed (with no cross fencing). A portion of this pasture was highly overgrown because the fence was in disrepair. A barn on the farm was beginning to show significant disrepair. The lease was a year-to-year affair and the farmer had little certainty he would have the property from one year to the next. The farmer had been using no-till farming practices on the 90 acres of cropland. Thus, soil erosion was minimal. However, even with the no-till there were gullies on the farm. Also, some of the cropland needed to be rotated to grass hay but due to the year-to-year nature of the lease the farmer could not justify the investment. This type of scenario is repeated hundreds of times across the Shenandoah Valley.

Executive Summary

The Shenandoah County Sustainable Farm Demonstration was initiated in 2013 to demonstrate long-term sustainable farming practices at the Shenandoah County Farm. To date, all of the structural improvements that were planned for this project have been installed. Additional maintenance is needed to the barn and machinery shed. The farmer is utilizing a multitude of Best Management Practices during his day-to-day farming operations including no-till farming, installing cover crops, and following a Nutrient Management Plan.

Table 1: Summary of BPM Construction and Maintenance at the Shenandoah County Farm

•Fence Constructed = 2 Miles
•Underground Pipeline = 2,120 Feet
•Above Ground Water Line = 200 Feet
•Two Livestock Water Troughs
•Grassed Waterways about 4,784 Feet Encompassing About 4 Acres of Farmland
•Many Honey Locust Trees Removed
•Land Reclaimed = About 15 Acres
•Gutter and Siding Repair to Barn and Machinery Shed

Table 2: Summary of Landowner Expenses and Income Associated with the County Farm

Perimeter Clearing and Fence	$27,737
Water System and Interior Fence	$0
Grassed Waterways	$8,033
Farm Building Maintenance (do not have actual numbers yet)	$16,881
Future Building Maintenance	$8,000
Estimated Total Electricity for 10 Years (based on 18 months of use data)	$3,500
Projected Total Expenses	$64,151
Projected Income	$68,000
Projected Net Return to Landowner	**$3,849**

Response to the Problem

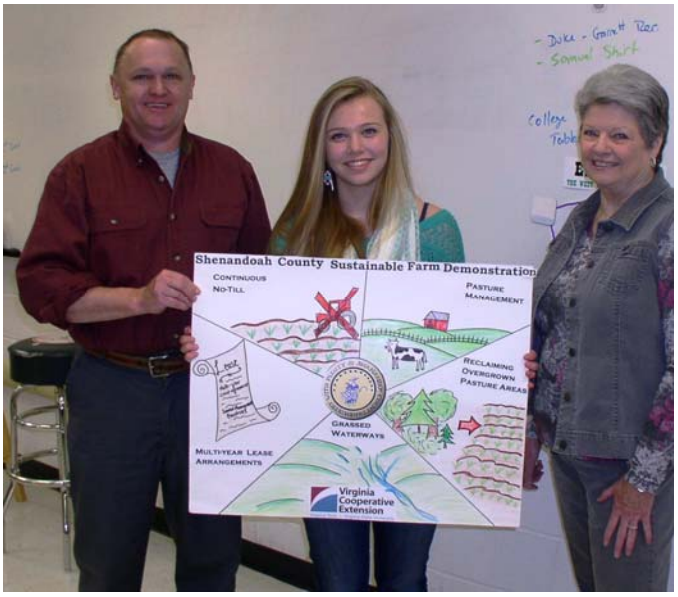
The Shenandoah County Sustainable Farm Demonstration was initiated in 2013 to demonstrate long-term sustainable farming practices at the Shenandoah County Farm. This is a full systems approach that integrates all aspects of long-term farmland sustainability. Sustainable, in this context, has three distinct meanings. First, the farm demonstrations will showcase farming practices that are sustainable from water quality and build soil health. A multitude of BMPs will be installed and practiced to showcase environmentally-sound agriculture. Second, the farm will be sustainable from the viewpoint of farm profitability. Farmers cannot stay in business without being profitable. Finally, the farm will be sustainable from the viewpoint of the landowner. Often landowners will not invest in fencing, building repair, or Best Management Practices (BMPs) because of a lack of certainty that they will recover their investment from land rent. This project will integrate all of the agricultural lands on the Shenandoah County Farm (approximately 150 acres) into this Sustainable Farm Demonstration.

Progress to Date

Shenandoah County signed a 10-year lease with a farmer effective February 2013. The lease was designed to achieve the balance between ensuring the farmer could operate his business efficiently while also installing a multitude of structural improvements to the land. Components of this lease are serving as a model for other landowners.

A contest was held with the three school Vocational Agriculture Programs and the Massanutten Governor's School for Integrated Environmental Science & Technology. Twenty-one students entered signs. The winning design (shown on page one of this report) was used to prepare the sign that represents the demonstration. In addition, 500 copies of a tri-fold brochure were printed to educate people about the Sustainable Farm Demonstration.

To date, all of the structural improvements that were planned for this project have been installed (outlined in Table 1). With the exception of the perimeter fence and barn maintenance (which was paid for by Shenandoah County), GG Farms installed all of the other improvements. This was achieved using a combination of their farm resources, State Cost Share Funds, Federal Cost Share Funds, and funds from Shenandoah County. The total investment of State and Federal Cost Share Funds in the County Farm total $68.767. This does not include state and federal personnel time designing the structural improvements. The farmers investment includes funds for interior fence, land clearing, overseeding barren areas, spending time working with State and Federal Cost Share Programs, and following Best Management Practices in the day-to-day farming operations on the County Farm. The farmers cost has not been calculated because it would include all of their production practices on the farm. In addition to these installations, GG Farms is following a multitude of Best Management Practices during his day-to-day farming operations including no-till farming, installing cover crops, and following a Nutrient Management Plan.



Picture Above: Nicole Baker, a student at Central High School (center), displays her winning design with Extension Agent Bobby Clark and Valley Conservation Council Representative Joan Comanor.

Hay rides were provided to showcase the County Farm during the Extension Farm and Family Showcase.

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Water Quality Benefit

All of the Best Management Practices installed and practiced by the farmer have water quality benefits. We engaged the services of Water Stewardship to develop a "Continuous Improvement Plan" for the County Farm. Through this process we were able to determine the water quality benefit of these best management practices. These benefits become part of the Comonwealth's water quality improvement goals in the Chesapeake Bay.

Projected Water Quality Benefit of Installing These BMPs to the Chesapeake Bay

- **Nitrogen Reduction of 1,745 Pounds Per Year**
- **Phosphorus Reduction of 107 Pounds Per Year**
- **Sediment Reduction of 101 Tons Per Year**

Wildlife on the County Farm

Financial Outlook

One of the goals of this project was that the landowner be financially whole. Barring some unforeseen problem, we are on track for the landowner to come out financially whole. Table 2 gives an overview of the landowner's financial outlook. This financial outlook includes a projection that an additional $8,000 in building maintenance is needed. We know that there are two leaks on the main barn and a rusty roof on the machinery shed that need to be fixed.
The financial outlook below is not exact. For example, this table does not include the efforts of Shenandoah County Maintenance Personnel. County maintenance staff have done considerable work removing brush, fixing some problems with the barn, and ensuring the well does not freeze in the winter. Also approximately one-third of the perimeter fence was constructed to allocate about 10 acres of farmland to the County Park (but all of the fence construction cost is shown in this budget). In addition, the farm lost slightly less than an acre of land along Teaberry Road to accommodate the walking trail (a new fence was needed along Teaberry Road no matter where the fence was constructed).

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<u>Additional</u> Investment into the County Farm

The combined investment in Structural Best Management Practices on the County Farm Property (which includes the grassed waterways, interior fencing, watering systems, renovating overgrown pasture and brush removal) from the Lord Fairfax Soil and Water Conservation District, the USDA Natural Resources Conservation Service, GG Farms, and Valley Conservation Council is over $80,000.

Partnerships

This project is a collaborative effort of a multitude of groups.

Virginia Cooperative Extension
Virginia Tech • Virginia State University

Shenandoah Valley Battlefields Foundation

Water Stewardship
Improving Water Quality Sustaining Agriculture

LORD FAIRFAX SWCD
SOIL & WATER CONSERVATION DISTRICT
We work with the people who work the land.

Valley Conservation Council

Tuscarora Trail

Shenandoah County
Parks and Recreation Department

NRCS Natural Resources Conservation Service

GG Farms

A mix of Small Grain and Crimson Clover planted as cover crop on the County Farm.

Pasture Management and Excluding Livestock from Surface Water

All fencing and a watering system have been installed for both the managed grazing demonstration and the demonstration of reclaiming the overgrown pasture. This includes over 10,000 feet of fence and 2,000 feet of pipeline. Funding for this effort was a collaborative venture between Shenandoah County, the farmer leasing the land, and the Lord Fairfax Soil and Water Conservation District.

A water trough installed to provide water to livestock in lieu of using the pond or small stream.

Installing a water line to supply water for livestock.

Livestock were excluded from a pond and a small stream. The pond and a small portion of the pasture were subsequently allocated to the County Park. They have expanded the Disc Golf Course from a nine-hole course to an 18-hole course. The pond and surrounding area is also open to light recreation.

Picture Above Left: The pond on the Shenandoah County Farm prior to livestock exclusion.

Picture Above Right: Pond and a portion of farmland adjacent to the pond was made available to the County Park. It is being used for disc golf and other light recreation.

Perimeter Fence Construction

Shenandoah County paid for the construction of a new fence along a public road that adjoins the County Farm. This fence is part of the pasture system on the County Farm. This fence had become highly overgrown. Removing the fence and excess growth improved road safety and it improved the view of the County Farm. Also, the fence was set back from the road by 15 feet to allow better access to the park for the Tuscarora Trail.

Picture Top Left and Right: Fence along Teaberry Road prior to fence construction (Left) and after new fence construction (Right). Note the blue paint on the nearest post marking the Tuscarora Trail.

Picture Bottom Left and Right: The County Farm is the site of The Battle of Toms Brook in the Civil War. Removing the overgrown fence along Teaberry Road allows visitors to view the County Farm.

Clearing trees and fence construction along Teaberry Road.

There were two miles of interior fence constructed on the County Farm.

Grassed Waterways

Grassed waterways are installed on farmland to prevent soil erosion in areas where surface runoff is inevitable. Approximately 2.8 acres of grassed waterways have been installed to date. An additional two acres will be installed in the future. The waterways are designed to allow surface water to exit the field without causing erosion. Also, the grass will filter sediment and nutrients that may run off of the cropland.

The installation of these grassed waterways was a collaborative effort between the USDA Natural Resources Conservation Service, the Lord Fairfax Soil and Water Conservation District; the farmer renting the land and Shenandoah County (all four paid a portion of the cost for installing these waterways).

Pictures to the Right and Below:
Before and after images of grassed waterways that were created on the County Farm.

Renovating Overgrown Pastures

Three different techniques have been used to remove some of the brush and invasive species. The costs of each has been documented. We conducted one educational meeting about brush control. Landowners and farmers will be able to visit the farm in the future so they can choose the method that is most appropriate for their farm.

This machine, equipped with a shear (hydraulic scissors) was used to remove about 140 Honey Locust from the County Farm.

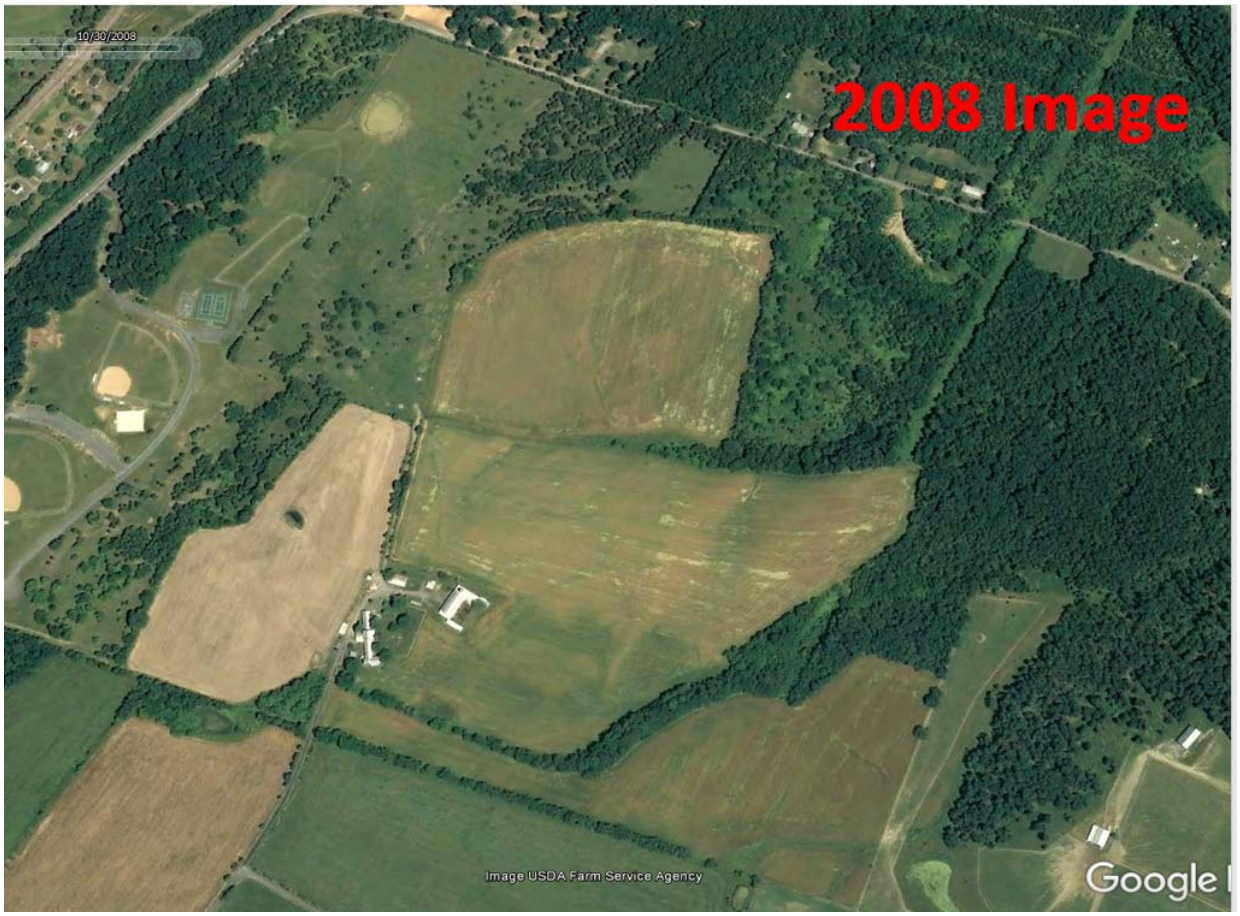
Often land that is rented in year-to-year lease arrangements become overgrown because neither the farmer or the landowner is willing to spend money or time removing small seedlings. Due to the long term lease, it was justifiable to complete this work.

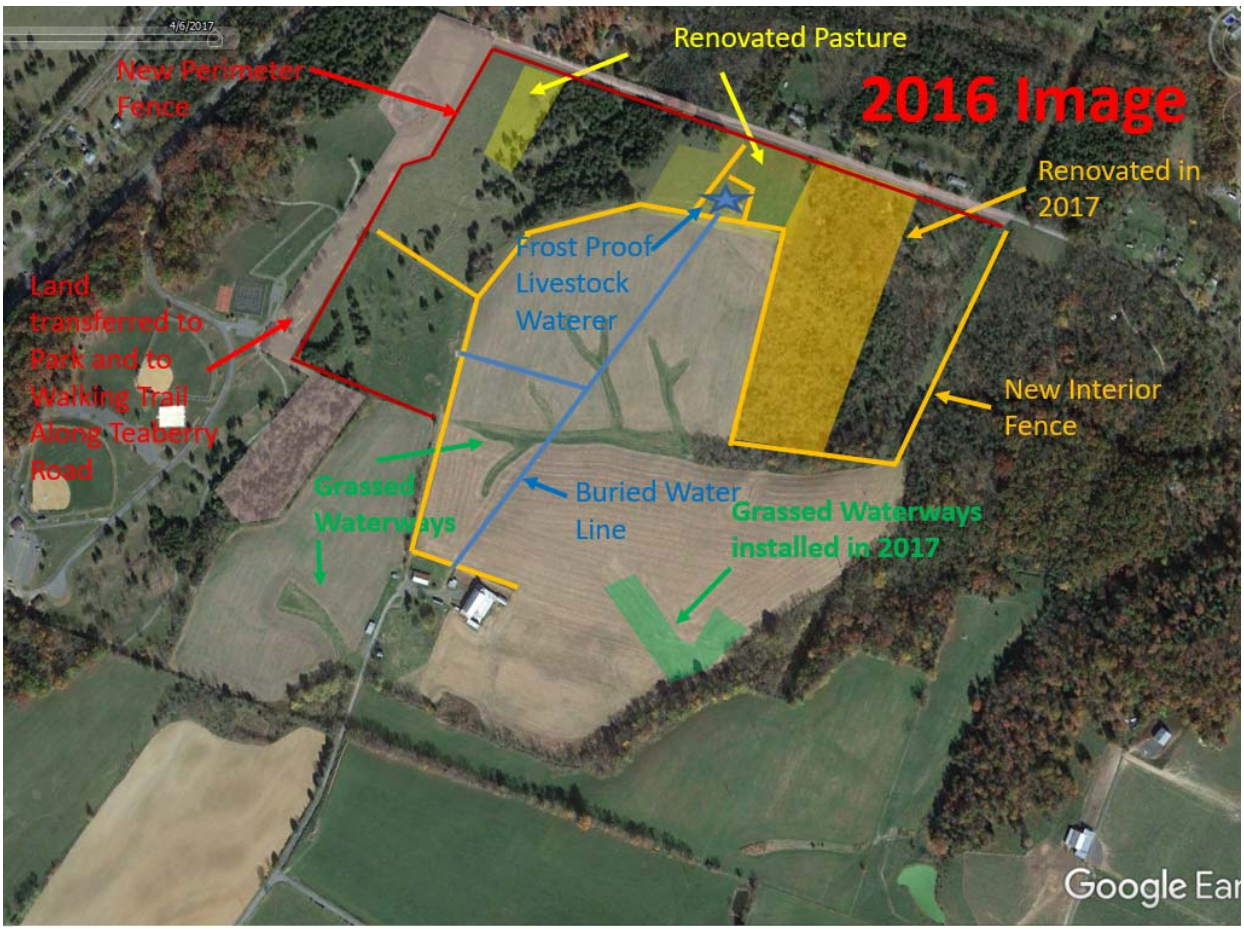
Above Picture and Picture to Right:
Clearing overgrown pasture on the County Farm and new grass established.

Building Maintenance

The barn, machinery shed, and pump house are an integral part of vibrant agriculture on the County Farm. In 2016 and 2017, significant effort was made to remove brush from around the buildings, replace guttering, and repair some of the siding.

Picture to the right shows the barn prior to removing brush and reinstalling guttering. The picture below shows the barn after completing the maintenance.


10/30/2008
2008 Image
Image USDA Farm Service Agency
Google


4/6/2017
Renovated Pasture
New Perimeter Fence
2016 Image
Renovated in 2017
Frost Proof Livestock Waterer
Land transferred to Park and to Walking Trail Along Teaberry Road
New Interior Fence
Grassed Waterways
Buried Water Line
Grassed Waterways installed in 2017
Google Ear

Community Wide Benefit of the Shenandoah County Sustainable Farm Demonstration

Each year Extension Agents in the Northern Shenandoah Valley likely meet with 20 to 30 landowners. These people are seeking guidance on how to lease their farmland to area farmers. Although there are a multitude of diverse goals, most of these landowners want the farms to be self-sufficient financially and they want to be protective of the environment. Farmers often seek guidance as to how they can structure leases that accommodate landowner goals while enabling them every chance to be profitable. The Shenandoah County Farm is serving as an example to show landowners that it is possible to sustain vibrant farmland without the net expenditure of funds, to farm in an environmentally-sound manner, and for farmers to have ample opportunity to be profitable. It is also helping farmers develop lease arrangements with landowners. Virginia Cooperative Extension will be highlighting the results of this demonstration in presentations to landowners and farmers throughout the Northern Shenandoah Valley. A web site has been created to make leasing information more readily available to both farmers and landowners.

https://shenandoah.ext.vt.edu/programs/sustainable-farm-demonstration.html

Turkey forage for food on a snowy day at the County Farm.