Project Grass

Growing Greener Grant Report

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Introduction

The Southwest Project Grass Chapter is a grassroots organization that promotes rotational grazing throughout 14 counties in Southwestern Pennsylvania. Rotational grazing is an alternative management strategy that focuses on increasing forage species production in order to lower farm economic inputs. Increased net profit may result, as farmers are able to reduce acreage under cultivation, and thereby lower input expenses. Increased reliance on pasture production may eliminate tillage on acreage formerly needed for supplemental feed production; thereby reducing soil erosion, fossil fuel burning and commercial fertilizer application. Rotational grazing may reduce the need for costly manure storage facilities by allowing animals to evenly distribute manure over pasture areas. The distribution of manure in this manner may reduce odor problems where urban and agricultural communities co-exist, and reduce environmental damage from non-point source pollution. The benefits gained from a more widespread acceptance of rotational grazing include increased agricultural sustainability, reduced environmental degradation and improvement in the quality of both animal and human health.

Project Grass received a grant for $150,000 from the Department of Environmental Protection through the Pennsylvania Growing Greener Program. The purpose of the grant was to establish demonstration farms to promote rotational grazing as both a best management practice and as a nutrient management tool. This grant provided up to 75% of the cost to install fencing for rotational grazing systems. A total of $255,290.05 was spent on demonstration farms across the 14 county region including $150,000.00 provided by the grant and $105,290.05 in matching funds, with the majority supplied by farm owners. Other matching funds came from the Chesapeake Bay Program, the Western Pennsylvania Conservancy, Redstone Turnpike Mitigation project, Pheasants Forever, other Growing Greener Grants received by Centre County Conservation District, and the USDA CREP and EQIP Programs.

This report is a summary of the Growing Greener Grant that was made available to farmers for rotational grazing projects, included is an assessment of the benefits realized as a result of the implementation of the projects. Each of the demonstration farms was visited in order to document that rotational grazing is a best management practice and a nutrient management tool. The following information was collected from each demonstration farm:

Acres Fenced with Grant Money
Number and Type of Livestock
Watershed Location
Fuel Saved as a Result of Grazing
Oxides of Nitrogen not emitted to the Atmosphere Associated with Fuel Savings
Carbon Dioxide not emitted to the Atmosphere Associated with Fuel Savings
Soil Saved as a Result of Grazing
Stream bank Fencing Installed
Commercial Fertilizer Saved as a Result of Grazing
Days the Grazing Season has been extended
Money Saved per Animal

The above information collected from the 17 demonstration farms for each category appears in the report that follows. Additionally, it provides project averages and some explanation as to how the calculations were made. The raw data information collected is contained in the last three pages of the report.

Acres Fenced with Grant Money

This is the amount of land area, measured in acres, that has been fenced by the farm operator to be used in a rotational grazing system. Some of the projects are new grazing systems while others are expansions of existing grazing systems.

The total acreage fenced is 466 acres, goal was 600 acres. Because of the lag time between the grant application and the awarding of the grant several of the projects changed, therefore changing the acres. The average acreage per farm is 27.4 acres, with the range being from 5 acres to 64 acres.

Number and Type of Livestock

This is the number and type of animals reported to be grazing on the 466 acres. The farm census includes four animal species comprising the following categories; sheep, beef, dairy, and horses. The number of sheep is 134 with the farm count ranging from 34 sheep to 100 sheep. These numbers include ewes, rams, and lambs. The number of beef animals is 324 that range from 5 beef animals to 59 beef animals per farm. These numbers include brood cows, steers, stockers, bulls, and calves. The number of dairy animals is 20 all from one farm. These numbers include heifers, and calves. There are 44 horses included in the grant.

Watershed Location

This is the watershed where each farm is located. This has been determined using a topographic map.

Fuel Saved as a Result of Grazing

This is the amount of fuel saved as a result of converting farmland to pastureland with the introduction of a rotational grazing system. Fuel savings is listed because the animals are allowed to directly harvest their feed, eliminating the cost of harvesting and hauling feed to the animals. Calculations based on prior land use, show fuel saved as a result of adoption of a rotational grazing system. The spreadsheet in the appendix calculates this value using numbers representing the average amount of fuel used per acre to plant, maintain, and harvest a crop. For example, by inserting the acreage of corn planted for corn silage, the program calculates the amount of fuel used to produce that crop. The amount of fuel used to drag, clip, and/or fertilize pastures is then subtracted from the amount used for crop production in order to determine the fuel saved. Since a fuel usage rate in gallons per acre

was not available for all crops or processes, the following equation was developed to calculate fuel usage:
Fuel used (gallons)=0.05 gal/hp hr x tractor hp x tractor time (hr/acre) x total acres
hp = horsepower
hr = hour
gal = gallons
0.02 to 0.05 = constant (average based on fuel consumption of a tractor)

Calculations show that for the scope of this project, the total amount of fuel saved is 1,927 gallons per year. The average saving per farm is 113.4 gallons per year with a range being from 0.0 gallons per year to 393 gallons per year. Reducing fuel use has the potential to not only benefit the individual farm economy, but may also reduce environmental damage from emissions of oxides of nitrogen and carbon dioxide.

Oxides of Nitrogen not Emitted to the Atmosphere Associate with Fuel Savings

This is the amount of oxides of nitrogen not emitted to the atmosphere based on fuel savings. When one gallon of diesel fuel is combusted 0.004 pounds of oxides of nitrogen are emitted to the atmosphere. The total amount of oxides of nitrogen saved is 7.7 pounds per year. The average amount saved per farm is 0.5 pounds per year with a range being from 0.0 pounds per year to 1.6 pounds per year.

Carbon Dioxide not Emitted to the Atmosphere Associated with Fuel Savings

This is the amount of carbon dioxide not emitted to the atmosphere based on fuel savings. When one gallon of diesel fuel is combusted 16.6 pounds of carbon dioxide is emitted to the atmosphere. The total amount of carbon dioxide saved is 29,869 pounds per year. The average amount saved per farm is 1,757 pounds per year with a range being from 0.0 pounds per year to 6,527 pounds per year.

Soil Saved as a Result of Grazing

This is the amount of soil saved when farmers convert cropland, permanent pastureland, or other prior use land to a rotational grazing pasture system. Calculations for soil loss are made using RUSLE (revised universal soil loss equation) or in some cases USLE (universal soil loss equation). Soil savings result when the ground is covered with vegetation for a greater portion of the growing season, or when the density of vegetation increases. When managed correctly, a grass-based rotational grazing system develops a dense cover that minimizes erosion. The values derived in this section of the report measure the difference between the erosion loss calculation based on the prior use of the land and the subsequent calculation for rotational grazing. The total amount of soil saved is 541 tons per year. The average amount of soil saved per farm is 31.8 tons per year with the range being from 0.0 to 140 tons per year.

The saving of topsoil has a positive impact on farm economics by reducing the loss of the lighter more easily eroded nutrient rich organic particles. Additionally, the reduction in both nutrient and sediment loading of waterways may improve the environment and help to restore ecosystem function.

Stream bank Fencing Installed

This is the footage of installed stream bank fencing used for limiting stream access to livestock. The total amount of stream bank fencing is 31,600 feet, goal was 20,000 feet. The average amount of stream bank fencing installed per farm is 1,859 feet with a range being from 0.0 feet to 8,250 feet. In addition 16 stabilized stream crossings/ access points were installed, goal was 4 stream crossings. Stream bank fencing is important for improving water quality for both farm animals and aquatic ecosystems.

Commercial Fertilizer Saved as a Result of Grazing

No fertilizer savings were documented. All projects planned on fertilizing the pastures to maximize forage production based on soil test and nutrient balances or plans.

Days the Grazing Season has been Extended

This value represents the days of additional grazing due to the implementation of rotational grazing. If a farmer did not graze his livestock before participation in this grant program, then the number of days is the entire grazing season. The gain in additional days of grazing are because the grazing system is either larger or productivity has increased. Increases in production and efficiency of forage species result from a rotational grazing system because the physiological plant processes are placed in a more natural sequence. This increases overall productivity and allows the extension of the grazing season.

The grant project has helped to extend the grazing season by 1,474 days. The average time of extended grazing per farm is 87 days with a range being from 20 to 235 days. Extending the grazing season is economically advantageous because the farmer no longer has to supply stored feed. The farm participants listed in this report realized the greatest savings from feed saved as a result of the lengthened grazing season.

Money Saved per Animal

This is the amount of money saved per animal by converting to rotational grazing. For this study the savings accounted for are: fuel savings, commercial fertilizer savings, feed savings, and labor savings. Other information such as savings in veterinarian bills and

reduced equipment maintenance costs were not contemplated in these calculations. The average amount of money saved per beef animal was $140.77 per year. The average amount of money saved per sheep was $23.66 per year. The average amount of money saved per horse was $48.32 per year. The average amount of money saved per dairy heifer was $135.00 per year. One note regarding return on investment, Project Grass initially spent $150,000 in grant money. This money yielded a total annual savings for participating farmers of $555,200.56. However, the installed hardware should have a minimal useful life of ten years therefore that savings should accrue year after year throughout the useful life of the fence. Over the life of the best management practices this is a 3.7 to 1 benefit to cost ratio. Every grant dollar spent made the farmer over three dollars and seventy cents.

Summary

The information in this report overwhelmingly shows that rotational grazing is benefiting the farmers both economically and environmentally. Project Grass spent $150,000 in grant money on this project with matching funds totaling $105,290.05 for a project total of $255,290.05. The total annual savings for the participating farmers are $555,200.56. The value for dollars saved is a very conservative estimate because not all factors were considered and the calculation was a one time saving rather than a yearly saving over the useful life of the equipment. Considered over a ten-year life expectancy the best management practices should show a 3.7 to one cost benefit ratio. Grazing gives farmers a good return on their investment and is a low input method of reducing production costs in an environmentally sound manner.

Rotational grazing is a best management practice and a nutrient management tool that works and benefits the environment. Rotational grazing reduces erosion by encouraging permanent seeding of tillable cropland and protects of the atmosphere by reducing emissions from the burning of fossil fuels. It helps save natural resources and can help to improve water quality. Rotational grazing has been associated with improving livestock health, thereby reducing veterinary bills. When rotational grazing is correctly managed it has the potential to shift animal production to a system of farming that protects the environment, increases profitability using low input management decisions and sustains the future strength of American agriculture. These objectives will benefit everyone.

This report indicates that the individuals involved in this project are truly helping to sustain of one of our greatest strengths, that of a healthy and prospering farm community. Project Grass is changing the way farmers meet economic and environmental objectives in the fifteen counties it serves, but there is much more to do. If this work is to continue, additional funding is needed. I would like to thank all the farmers, Conservation Districts, USDA Agencies, DEP, and others who participated in this project.

Appendix

Borkowski, watering system in Washington County for beef cows.

Brachovich, fencing system for beef cows in Armstrong County.

Brown, fencing system for beef cows in Cambria County.

Misera, fencing system for beef in Butler County.

Sheppeck, watering facility for beef cattle.

Stiffler, fence system for beef cows and horses in Westmoreland County.

Truit, watering facility for beef cows in Armstrong County.

Wilson, watering and fencing system for beef cows in Fayette County.

Beegle, fence system for beef cows in Bedford County.


Fetteriof, fencing system for sheep in Allegheny County.

Patton, watering system for beef cows in Beaver County.

Mingle, streambank fence for beef cows in Blair County.