Economic Based Decision Support for Sustainable Horse Drawn Farming Enterprises

Final Report for GNC14-183

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Grant Recipient: Purdue University
Region: North Central
State: Indiana
Graduate Student:

Elizabeth Byrd

Faculty Advisor:

Nicole Olynk Widmar
Purdue University

Project Information

Summary:

This project addresses horse drawn farming as a sustainable form of agricultural production and agro tourism in the North Central region. The Horse Drawn Farming Readiness Assessment Tool is an interactive, qualitative tool to help individuals considering horse drawn farming decide whether it is right for their current level of knowledge about horses, lifestyle goals, and farming style. An enterprise budget for horse drawn farming will help both beginning and continuing farmers accurately account for the cost of production with horses and/or tractors.

Introduction:

This project addresses the lack of research-based information available about the economics of horse drawn farming as a viable option for a sustainable form of agricultural production and agro tourism in the North Central region. Information used to construct a qualitative assessment tool and a horse drawn farming enterprise budget was provided by a working farms Indiana and through a review of available literature. This project will contribute to improved profitability of farmers and ranchers by helping them make sound financial decisions when adopting horse drawn farming, which can be an economically and environmentally sound and sustainable practice. Improving profitability and contributing to economic and environmental sustainability will improve the quality of life for farmers and ranchers as well as those they serve with their production and/or agro tourism services. By contributing to the profitability of farms and agricultural businesses, working to preserve and improve the natural resources and environmental qualities on which agriculture depends, and enhancing the quality of life for the farmers themselves, as well as rural communities, this project contributes directly to the broad-based

outcomes of SARE in the North Central Region.

SARE has funded only one other grant related to horse drawn farming; that study concluded in 1999 by D. Stinner and focused on the quality of life of Amish farmers and the efficiency of nutrient cycling on Amish farms (Integrating Quality of Life, Economic, and Environmental Issues: Agroecosystem Analysis of Amish Farming). The proposed project differs substantially in its design and products. While that study focused specifically on Amish Farmers, the proposed project seeks to create workable tools for horse drawn farming that is applicable to anyone who is considering the financial ramifications of horse drawn farming. In the Journal of Extension in 2007 another Amish-focused study was published establishing a series of enterprise budgets for Amish farms. While not directly applicable to all farming situations, the available literature, especially that focused on the development of enterprise budgets, will be leveraged in this proposed work.

Beyond Amish-focused studies, several trade press articles have been focused on horse powered farming in recent years, as the topic is one of increasing interest. Notably, Anne and Eric Nordell (2012) addressed the lack of sound models for the use of horses in farming in a publication in The Small Farmer's Journal: "Thanks to the many apprenticeship programs, field days, conferences, websites and publications available in the new millennium, it is relatively easy for new and transitioning farmers to learn the business of small-scale organic vegetable production. Economic models of horse-powered market gardens, however, are still few and far between." Four farms were studied in depth by Nordell (2012) to develop a model of the costs of farming with horses, however a more in-depth analysis which utilized the expertise of Purdue University and the Extension and outreach network in place there would serve to leverage previous findings, such as these from The Small Farmer's Journal to reach larger numbers of interested farmers.

This project is important and timely because an increasing number of both established and beginning farmers are seeking alternative methods of power for agricultural production due to increasing input prices and/or environmental concerns. In fact, it is estimated that approximately 400,000 operations in North America utilize draft horses in some capacity (Raver, 2013). Likewise, an increasing number of individuals are choosing small farms as part of their lifestyle. Regardless of size or intended purpose of the farm, sound financial decisions are needed to ensure the ongoing success of the operation and quality of life of the farmer or rancher. However, there is a lack of university-developed, peer-reviewed research for those considering horse drawn farming to rely on to make decisions. Furthermore, there is limited availability of sound information and decision support for on-farm decisions incorporating sustainability in an economic, social, and environmental sense when it comes to animal-powered farming.

Literature Cited:

James, R. 2007. "Horse and Human Labor Estimates for Amish Farms." The Journal of Extension. 45:1.

Nordell, Anne and Eric. 2012. "The Cost of Working Horses." The Small Farmer's Journal. http://smallfarmersjournal.com/the-cost-of-working-horses/

Raver, Anne. 2013. "Farm Equipment That Runs on Oats" The New York Times. http://www.nytimes.com/2013/05/16/garden/farm-equipment-that-runs-on-oats.html?pagewanted=all&_r=1

Stinner, D. 1999. "Integrating Quality of Life, Economic, and Environmental Issues: Agroecosystem Analysis of Amish Farming." SARE Research and Education Project.

Project Objectives:

Several short term outcomes and outputs were identified in the proposal based on initial meetings with farmer participants and a literature review. Institutional Review Board (IRB) approval was sought for a series of questions that would be asked of farmer participants. The IRB at Purdue University determined that IRB Review was not required in a response issued 10-7-14. The questionnaire was emailed to farmer participants to facilitate discussion at meetings and collection of data from farmer participants. The PI, Elizabeth Byrd, in a series of visits to a working farm utilizing horse power, participated in all aspects of the operation. This included learning about horse drawn implements and farm equipment, caring for draft horses, harness horses, safely hitching horses to equipment, driving horses, and operating several different implements. Elizabeth was able to drive horses single, in a team, and four abreast. Finally, Elizabeth was able to learn about conditioning of work horses and monitoring their exertion during work. This in depth experience, along with her previous knowledge of riding horses, provided valuable insight into the basics of farming with horses and the needs and desires of the farmers and ranchers interested in horse powered farming. Elizabeth was able to learn the basic practices of farming with draft horses while interacting with others interested in horse drawn farming who would be the same clientele interested in the outcomes and deliverables of this project. Information learned during the training along with an initial literature review provided the framework for information products included with this report.

In terms of intermediate outputs, an interactive qualitative decision support tool, the Horse Drawn Farming Readiness Assessment Tool (HDFRA), was conceived of based on interactions with farmer participants and clinic participants, literature review, and field visits. An important aspect of Elizabeth’s experience during farm visits and interacting with other interested parties was the role of horse drawn farming in the lifestyle of the owner/teamster and the farming or operational style best suited to farming with horses. The HDFRA provides insight for the decision to pursue horse drawn farming based on what resources the farmer has, preferred lifestyle, farming operational style, and alignment with values.

Adaptations of enterprise budgets were also an output of this project. Numerous enterprise budgets for various crops are available from universities in the North Central Region and in other regions. A document explaining how to adapt existing budgets, for example a corn enterprise budget using conventional tractor power, to one using horse drawn power by utilizing information collected from farmer participants, the horse drawn farming clinic, a literature review, and existing equine enterprise budgets for other types of horse businesses. This facilitates producers making decisions between horses and tractors for their given operation. Likewise, it givens those considering utilizing horse power a tool to calculate and understand the costs of keeping horses.

This project research was accepted and presented as a poster at the 2015 Indiana Small Farms Conference where the poster was on display for conference participants and PI interacted directly with interested participants during the poster sessions. Feedback on the information products was solicited from farmer participants. Then, peer review of the information products for extension publications was sought through the Department of Agricultural Economics at Purdue University. The information products will be made public through the Education Store at Purdue University upon final editing and formatting through the Department of Agricultural Communications at Purdue University.

Cooperators

- Dris Abraham

  rxacresbelgians@aol.com

  Farmer

  RX Acres Belgians

  8957 S. 300 E.
  Brookston, IN 47923

  (765) 479-0369 (office)

- Melissa Brown

  agmanager@prophetstown.org

  Breeding Manager

  The Farm at Prophetstown

  8957 S. 300 E.
  Brookston, IN 47923

  (765) 479-0367 (office)

- Greg Schneider

  gschneider@swjcs.us

  Farmer

  Cave Springs Farm

  7398 W Chicken Run Rd
  Madison, IN 47520

  (812) 866-3831 (office)

Research

Materials and methods:

Information gathered during farm visits and from the literature review was organized into the qualitative Horse Drawn Farming Readiness Assessment Tool (HDFRA) to help those interested in horse drawn farming assess their readiness for the operation based on horse knowledge, farming style, lifestyle goals, and available resources. Questionnaires, clinic participation by the PI, and farm visits were used to gather information about other factors, beyond economic and financial concerns, that potentially impact the success of a horse-drawn farming operation. This information, along with a review of relevant literature, provided guidance in developing the HDFRA.

Budgets are a valuable tool for any farm business whether horse-powered or not.

Farm businesses could use budgets to help estimate or project how profitable an enterprise they are considering starting may be or to evaluate the profitability of existing enterprises on the farm. Enterprise budgets are usually developed on a per-acre, or per-unit of production basis, facilitating interpretation for on-farm decision making. Enterprise budgets can be helpful to a farm business by organizing and itemizing the receipts or income for an enterprise alongside the inputs and resources employed in that enterprise. Thus, beyond the calculation of total profit generated by the enterprise, the exercise of creating and analyzing enterprise budgets can provide valuable insights. Existing enterprise budgets can easily be adapted for horse drawn farming. This allows farmers to evaluate whether horse drawn power, either complete or in conjunction with tractors, makes financial sense for their operation. Thus, the document “Enterprise Budgeting and Considering Horse-Drawn Power in Farming” was created to assist those utilizing or considering horse power in adapting existing enterprise budgets, available from several university Extension websites and publications, to using horse power. A careful consideration of how costs and revenues may change when utilizing horse power will assist farmers in making the decision whether to transition to horse power from tractor power. Enterprise budgets are designed with an assumed set of operating decisions and prices. However, budgets allow users to customize the tool to their operation to yield more realistic results to guide their decisions. Thus, this information product assists users in adapting existing enterprise budgets for use with complete or partial horse power on their farms.

Research results and discussion:

This project consisted of three primary outputs: The Horse Drawn Farming Readiness Assessment Tool with an accompanying document “Is Horse Drawn Farming for Me?” to help users explore their level of knowledge, fit with operational style and lifestyle, and available resources. Finally, the adaptation of existing Enterprise Budgets to horse drawn farming is discussed in "Enterprise Budgeting and Considering Horse-Drawn Power in Farming." Together these tools provide those interested in horse drawn farming and those already involved both qualitative and quantitative tools to make informed, economical decisions about adopting or improving their use of horses as a means of on farm power.

Horse Drawn Farming Readiness Assessment Tool (HDFRA)

The Horse Drawn Farming Readiness Assessment Tool (HDFRA) is an interactive tool designed to assist users in evaluating some of the qualitative aspects of the decision to adopt horse drawn farming. The HDFRA incorporates individual parameters in the form of self-assigned scores in the areas of current horse knowledge (both horse care and horse riding/driving experience), knowledge about the revenue generating portion of your business, alignment with lifestyle/values, alignment with operational style (diversified vs. monoculture farm), and available resources (time, money, pasture, buildings, etc.). These elements are combined to make a personalized recommendation about whether horse-drawn farming is a good choice for the user and their operation. A further benefit of the tool is that it will help to identify areas where users may benefit from additional learning, information, or consideration. The accompanying document ““Is Horse Drawn Farming for Me?” explains the use of the tool as well as several important considerations about horse drawn farming.

Adaptation of Enterprise Budgets

The document “Enterprise Budgeting and Considering Horse-Drawn Power in

Farming" was created to assist those utilizing or considering horse power in adapting existing enterprise budgets, available from several university Extension websites and publications, to using horse power. Budgets are a valuable tool for any farm business, or any business regardless of the industry they are involved in. Farm businesses could use budgets to help estimate or project how profitable an enterprise they are considering starting may be or to evaluate the profitability of existing enterprises on the farm. Enterprise budgets are usually developed on a per-acre, or per-unit of production basis, facilitating interpretation for on-farm decision making. Enterprise budgets can be helpful to a farm business by organizing and itemizing the receipts or income for an enterprise alongside the inputs and resources employed in that enterprise. Thus, beyond the calculation of total profit generated by the enterprise, the exercise of creating and analyzing enterprise budgets can provide valuable insights. Of particular importance when considering integrating horse-drawn power into your farm business, different types of technology can be evaluated in separate enterprise budgets to allow analysis to be conducted and better inform enterprise planning and on-farm decision making. For example, if a farm were considering using horses to farm a portion of their farm's acreage but would produce a crop with horses that was also produced using tractor or machinery power, two distinct enterprise budgets could (and perhaps, should) be created and analyzed to facilitate informed decision making. Enterprise budgets are designed with an assumed set of operating decisions and prices. However, budgets allow users to customize the tool to their operation to yield more realistic results to guide their decisions. Thus, this information product assists users in adapting existing enterprise budgets for use with complete or partial horse power on their farms.

Participation Summary

Educational & Outreach Activities

PARTICIPATION SUMMARY:

Education/outreach description:

This project was presented as a poster at the 2015 Indiana Small Farms Conference where the poster was available for viewing to all conference participants and the PI conversed with approximately 25 conference attendees regarding the project. The information products associated with this project have successfully undergone departmental extension peer review within the Department of Agricultural Economics at Purdue University and are in the process of being made publically available through the Education Store at Purdue University. Thus, all information products will be publically available. Additionally, information products have been submitted to the SARE database with the completion of this project.

Project Outcomes

Project outcomes:

This project research was accepted and presented as a poster at the 2015 Indiana

Small Farms Conference where the poster was on display for conference participants and PI interacted directly with interested participants during the poster sessions. Feedback on the information products was solicited from farmer participants. The information products will be made public through the Education Store at Purdue University upon final editing and formatting through the Department of Agricultural Communications at Purdue University. Farmer participants and others offering horse drawn farming clinics are expected to utilize and share these materials through field days, clinics, and demonstrations.

Economic Analysis

Enterprise budgets provide an estimate or best guess of projected revenue, estimated expenses, and expected profit from a single enterprise (Kay, Edwards and Duffy, 1994). Many budgets are available free from Extension websites for a variety of crops and livestock enterprises including equine enterprises. These can be customized to be a better fit for an individual operation. Once an enterprise budget is completed, it can be used to choose between enterprises based on which one is the most profitable or become part of a "whole farm plan" which contains multiple enterprises (Kay, Edwards and Duffy, 1994). Enterprise budgets are typically created for a one year time period and on a per unit basis such as per acre or per steer.

Enterprise budgets can be helpful to a farm business by organizing and itemizing the receipts or income for an enterprise alongside the inputs and resources employed in that enterprise. In addition, all costs are itemized, quantified, and accounted for on the same document. Thus, beyond the calculation of total profit generated by the enterprise, the exercise of creating and analyzing enterprise budgets can provide valuable insights. For example, enterprise budgets are valuable in completing breakeven analysis for prices and yields. The breakeven price is calculated as follows:

Breakeven price = total cost ÷ expected yield

The breakeven yield is calculated as follows:

Breakeven yield = total cost ÷ output price

Enterprise budgets can be created for each type of crop or livestock that is grown on farm. In addition, one could construct enterprise budgets for other more service-focused activities, such as an agritourism enterprise or other activity that your business may participate in. Enterprise budgets that are currently available typically deal with machinery related expenses (fuel, depreciation, interest). This project sought to provide those considering horse drawn farming with a way of adapting those budgets for use with horse drawn farming operations. This was accomplished with data from farm visits and a literature review.

In addition, enterprise budgets can be created for different levels of production of a single crop, such as a separate budget for high-yield versus low-yield corn. And, of particular importance when considering integrating horse-drawn power into your farm business, different types of technology can be evaluated in separate enterprise budgets to allow analysis to be conducted and better inform enterprise planning and on-farm decision making. For example, if a farm were considering using horses to farm a portion of their farm's acreage but would produce a crop with horses that was also produced using tractor or machinery power, two distinct enterprise budgets could (and perhaps, should) be created and analyzed to facilitate informed decision making.

Literature Cited:

Kay, R. D., Edwards, W. M., & Duffy, P. A. (1994). *Farm management* (pp. 281-299). New York: McGraw-Hill.

Farmer Adoption

Three farmers were directly involved in the conception, development and material review process. The poster presentation at the 2015 Indiana Small Farms Conference resulted in direct contact with an estimated 25 individuals and was available for all conference participants to view. Finally, all information products are being made publically available through both the SARE database with the completion of this report. Information products are also in the process of being made publicly available as peer-reviewed extension publications which can be downloaded from the Purdue Education Store. It is expected these materials will be used by farmer participants and others who operate horse drawn clinics as an educational tool.

Recommendations:

Areas needing additional study

The Horse Drawn Farming Readiness Assessment Tool provides a qualitative assessment of an individual's or operation's knowledge and skills as well as fit with lifestyle and operational style. This framework could also be utilized for any assortment of crop and/or livestock enterprises where lifestyle, sustainability, or agritourism are important considerations.

The adaptation of enterprise budgets to horse drawn farming included in this project necessarily rely on assumed prices for purchased inputs and farm outputs. While this research sought to provide a useful tool for those considering or already involved in horse drawn farming in the North Central region, prices are not expected to be homogeneous throughout the region. In particular, farmers who raise a great deal of their inputs, such as hay or grain, may have a more difficult time accurately accounting for the full cost of production. This study utilized nationally representative prices. However, the enterprise budgets were designed so that users could change prices to best represent their operations. This study endeavored to create enterprise budgets that were realistic and accurate but easy to use and customize with an operation's own data.

Information Products

- Enterprise Budgeting and Considering HorseDrawn Power in Farming (Bulletin)
- Is Horse Drawn Farming for Me (Bulletin)
- Horse Drawn Farming Readiness Assessment Tool (Decision-making Tool)

US Department of Agriculture

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