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Evaluating perennial crop options for inclusion in agroforestry systems

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Evaluating perennial crop options for inclusion in agroforestry systems

Abstract

The challenges and opportunities, including financial returns, were studied for six different perennial crops that can be used in agroforestry practices. Crops investigated were aronia berry, black walnut, chestnut, Christmas trees, elderberry and hazelnut.

Keywords

Agroforestry

Disciplines

Forest Management | Fruit Science | Horticulture



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Budget:
\$7,532 for year one

Q What crops have high potential as species for inclusion in agroforestry practices?

A This project showed that several of these identified crops can generate per acre returns greater than row crops over a projected 20-year time frame, although risk is generally higher. Barriers to wider adoption and marketing channels also were addressed in this study.



ECOLOGY

Background

Perennial crops such as trees and shrubs provide a wide range of environmental services and can be incorporated into various agroforestry systems. However, despite all the benefits they provide, they are not widely grown in Iowa. For this project, Trees Forever investigated six different perennial crops: aronia berry, black walnuts, chestnuts, Christmas trees, elderberries and hazelnuts. The premise of this study was that with the high price of commodity crops putting pressure on conservation acres and perennial cover, the financial benefits that these alternative crops can provide may persuade growers to convert a portion of their crop ground to production practices that have greater environmental benefit to the larger community. The study addressed the benefits and risks of growing these crops, as well as the potential financial value of production.

Approach and methods

At least three different growers (20 total) were interviewed in 2013 for their insights about each crop. Most were based in Iowa, but a few were out-of-state producers. Information about motivation, establishment, production data, pricing information, markets, challenges, failures and successes was solicited. Virtually all growers were very candid in their responses regarding the issues discussed. After the results from these interviews were reviewed, one grower of each crop was profiled in a case study to showcase the opportunity that can be realized by growing a perennial crop such as trees or shrubs.

An enterprise worksheet for each crop was developed based on feedback from growers. Estimated yields, pricing data, establishment, maintenance and harvest costs were calculated. Information from the worksheet, along with data from other sources, was used to construct a simple 20-year financial model for each type of crop. The model takes into account the large up-front establishment costs, as well as the time it takes before the crop generates income. Finally, the worksheets, financial models, and profiles of each crop were compiled in a landowners guide so that potential producers have a more complete picture of the realities associated with growing these perennial crops.



Grower Mark Clark's sign for his "real" Christmas trees.

Results and discussion

Based on the feedback received, chestnuts are the best perennial crop option with high-profit potential, relatively low risk and very strong demand. Chestnuts cannot be grown everywhere in Iowa, however, and are best suited for the southern counties.

Aronia and elderberry are the next best perennial crop options. They have high-profit potential but also carry higher risk, primarily due to limited and immature markets. Lack of an established market is the largest obstacle to wider adoption. Market aggregators (North America Aronia Cooperative and Minnesota Elderberry Cooperative) are starting to purchase berries from growers. When they are fully operational, they will represent the de facto market for growers in the Midwest who want to sell berries commercially.

Growing Christmas trees is a straightforward enterprise with low establishment costs and significant profit potential. However, virtually all profitable operations in Iowa sell trees directly from the farm to the consumer. This indicates that a successful Christmas tree enterprise is more akin to an agritourism operation than a commercial orchard. This marketing strategy, while necessary for profitability, limits wider adoption to growers willing to adopt the agritourism model of on-farm sales. Consumer preferences and market saturation also limit greater adoption.

Black walnuts are profitable, but to a lesser degree when compared to other options. A strong established market exists for improved cultivar black walnuts, so selling a crop is not a difficult matter. New varieties of black walnut mature more rapidly than older varieties that could take 12-15 years to reach maturity. Overall profitability is the main obstacle to wider adoption, along with disease and pest issues. Black walnuts require significant inputs to be grown profitably.

Hazelnuts are not profitable today, but future returns on investment are promising. The single greatest obstacle to wider adoption is the need for improved plant material. Without having more productive plants available, it will be challenging to create a viable industry. Lack of an established local market also is an obstacle. With continued research being conducted by groups such as the Hazelnut Consortium and Upper Midwest Hazelnut Development Initiative, it is expected that these challenges will be overcome in the years ahead.

Conclusions

This project shows that options exist for growing a perennial crop on acres that were formerly in row crops. These perennials have the potential for enhancing the sustainability of farming systems as well as improving water quality.

The main challenges associated with each crop are:

Aronia berry – novelty of the crop, limited market and lack of infrastructure to support an industry

Black walnuts – requires growing cultivars; i.e., named varieties such as “gala” apple or “Viking” aronia berry, and has a limited market



Young elderberry bushes in a row.

Chestnuts – somewhat labor intensive and still something of a “novelty” crop
Christmas trees – requires direct marketing from the farm and ability to grow the kind of trees customers want

Elderberries – novelty of crop, limited market, and limited infrastructure to support industry

Hazelnuts – lack of proven cultivars, limited market, and limited infrastructure to support industry

Information about how to grow perennial crops such as trees and shrubs needs to be more widely disseminated. The landowner’s guide document and corresponding case studies produced as part of this project will help in that effort by showing prospective new growers what is possible on their farms.

Impact of results

This project already has yielded positive impacts as potential growers have received the case study profiles at workshops coordinated by Trees Forever. Growers interested in diversifying their farms with an alternative to row crops frequently request financial information as well as basic production data. The PI hopes that seeing the results of this work will motivate landowners or farmers to do additional research on the opportunities available for their farms—perhaps they will seek out an existing grower to learn more—and eventually establish one of these crops.

Wider adoption of agroforestry practices and perennial crops will help improve water quality and ecological services by putting more roots in the ground. This work furthers that goal by helping inform landowners and farmers on the best strategies for adding trees or shrubs to their farm operations.

Education and outreach

Draft enterprise worksheets and financial models for black walnuts, chestnuts, and hazelnuts have been presented at the following meetings or workshops:

- Iowa Nut Growers Association (INGA) Annual Nut Evaluation in January 2014 (12 attendees), Ames, IA
- INGA 2014 Annual Meeting in April 2014 (23 attendees), Newton, IA
- Trees Forever Agroforestry Workshop, Villisca, IA, July 2014 (eight attendees)
- The hazelnut worksheet and financial model were presented at the 2014 Upper Midwest Hazelnut Growers Conference in March 2014 (37 attendees) in Gays Mills, Wisconsin. At least 75 individuals have been exposed to some of the opportunities available with perennial crop options.

For more information, contact:

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No additional funds were leveraged by this project.