**VALUING SUSTAINABLE AGRICULTURE PRACTICES**

By Robert Maggiani

NCAT Sustainable Agriculture Specialist

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**Abstract**

Planning the succession of a farm from one generation to the next is often a time-consuming, sometimes stressful, process, yet it is also an opportunity for everyone concerned to reflect on their vision for that land far into the future. It’s a chance to explore strategies for fostering sustainable agriculture practices and conservation on the land once the next generation takes over. The purpose of this publication is to help landowners, whether retiring farmers themselves or their heirs, examine the costs and benefits of implementing a variety of sustainable practices and evaluate whether the benefits warrant adjusting expectations for sale/rent/lease price on their land.

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**Introduction**

The term “sustainable agriculture” has been around for many years. But what, exactly, is it? You’re likely to get as many detailed definitions of “sustainable agriculture” as the number of experts you ask. But, basically, sustainable agriculture is about growing crops and managing livestock in ways that meet three objectives at the same time:

* Environmental conservation of natural resources
* Improved quality of life for the producers and their communities
* Profit for the producer

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For a more detailed description of sustainable agriculture, see the ATTRA publications *Applying the Principles of Sustainable Farming*, and *Sustainable Agriculture: An Introduction*. They are available at the National Center for Appropriate Technology’s ATTRA website [www.attra.ncat.org](http://www.attra.ncat.org).

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If you share these core values of sustainable agriculture, you might be wondering how to include them as you plan the transition of your farming operation — to a new farmer, a new landowner, or a new farm operator (if you’re not currently farming).

Of course, there are as many unique circumstances of land ownership, farm operation, family decision-making, and inheritance as there are farms. Even so, every piece of agricultural land has the potential for sustainable practices — *if* the land’s owners and operators make the choices that allow those practices to happen on the land.

Choices that will foster sustainable agriculture practices might be different from the choices that have been made over the past several years, or several decades. Making those new choices could mean considering practices that have never before been done on that land. In other cases, the choices might have to do with a family planning its finances in a way that will allow existing sustainable practices to continue.

It can be a stressful time when a farmer retires or a landowner transfers land to her heirs — but it also can be an opportunity for everyone concerned to think about the legacy they want to leave on the land and what their hopes for that land are far into the future.

What could sustainable agriculture look like for the next generation of farmers taking care of your property? Here are just a few examples:

* A new person taking over a cattle ranch might divide pastures into smaller paddocks within a rotational grazing system. These rotational grazing systems are good ways to manage water resources and soil fertility.
* A new farmer taking over a successful corn and soybean operation might shift to a three-year crop rotation and include cover crops such as alfalfa and rye for weed suppression and soil fertility. This would reduce the need for purchased fertilizer and pesticides.
* A large acreage might have a couple of smaller, 5- to 10-acre parcels split out for specialty-crop production, such as market-vegetable or fruit production.
* The new farmers taking over the land could establish windbreak plantings in strategic locations — along fence lines or around the farmstead buildings. The trees and shrubs in the windbreak could include fruit and nut-producing varieties that would provide a cash crop in future years.
* A new farmer on your land might pursue certification for organic production. This is a three-year process that, once complete, would make the farm’s products eligible for price premiums in the marketplace.

In some cases, the sustainable farming practices we will discuss result directly in a crop that can be sold. The profits from that salable crop may be competitive with cash grain (corn and soybean) sales, or the profit potential may be lower than that of cash grains. In cases where profit potential is lower, you should also look at the other, long-term financial or nonmonetary benefits from that practice. Is the practice something you want to foster through your financial and estate-planning decisions and through your expectations for the sale, rental, or lease price of your land?

In other cases, the sustainable farming practices discussed below do not directly result in a cash crop. Some of the practices may have an indirect monetary benefit in terms of lowering the cost of purchased inputs or in terms of improving overall soil quality, which could improve crop yields or lower the risk of reduced yields from poor soils in the future. Some of the practices may not have either a direct or an indirect monetary benefit, but they have an aesthetic benefit or benefits to society in terms of pollinator habitat, wildlife habitat, and water quality. There are state, Federal, and private programs available to help finance some of these practices that return environmental, rather than monetary, benefits.

Farmers and landowners have a great deal of power in their hands to choose sustainable practices for their land. The information that follows will provide you with the background you need on the costs and potential benefits of a variety of sustainable practices. With that background, you can start to make the financial plans and decisions that will enable the farmers on your property in the future to implement the practices you want to foster and encourage.

We will take a look at 10 possible strategies and provide some examples of how to evaluate their costs and benefits as well as consider their implications for your future plans:

* Crop rotation
* Soil-fertility management
* Cover crops
* Trees (agroforestry)
* Water-quality management
* Alternative crops
* Perennial forages/grazing
* Pollinator/beneficial insect habitats
* Wildlife-habitat management
* Organic certification

It’s important to note that, as we will see, many of these practices naturally overlap. For example, a purposeful system of crop rotations will almost always involve using cover crops. Similarly, soil-fertility management and water-quality management almost always go hand in hand.

Nevertheless, we will discuss each of the practices in order and discuss how to start evaluating whether they fit your vision for the future. And once you determine which practices could be both useful and valuable, you will be in the position to start researching how to set up financing and take other steps to encourage the new generation of farmers to adopt the practices.

**Crop Rotation**

Crop rotation is simply a matter of planting a predetermined sequence of crops in a given field. We’re starting with this practice because it is well known in the Midwest: it’s standard practice for most growers to practice crop rotation by alternating corn and soybeans in a given field each year.

In order to make this practice more valuable, it is necessary to go to a crop-rotation sequence that is longer than two years; many crop-rotation variants have been researched.

For example, a recent project done at the Marsden Research Farm by Iowa State Extension specialists compared two-, three-, and four-year rotations in the following order: corn/soybeans; corn/soybeans/oats; and corn/soybeans/oats/alfalfa. It looked at how much energy was used and the economic returns to the producer under each rotation sequence.

The results? The two-year rotation used more than twice as much energy in the form of fossil fuel annually as the three- and four-year rotations. In terms of economic returns per acre, the three-year crop rotation produced the highest returns because of increased yields and lower inputs.

Specifically, the return was $188 per acre for the two-year rotation; $194 for the three-year rotation; and $171 for the four-year rotation. To read the entire study, go to the Iowa State Extension website at [www.extension.iastate.edu/agdm/crops/pdf/a1-90.pdf](http://www.extension.iastate.edu/agdm/crops/pdf/a1-90.pdf).

It’s important for you and anyone who may be farming your land in the future to realize that this study and most other academic studies do not take into account government payments to producers. But producers do get direct payments every year for growing corn and soybeans. That means a producer who adopted a three- or four-year rotation would not get those payments for one or two years respectively for the acres with no corn or soybeans during the rotation.

This fact tends to prompt most producers to opt out of longer rotations that could help reduce the soil erosion on their farms. And that is a shame because saving one ton of soil is worth about $2.10 per year in fertilizer costs alone. In the Midwest, where there is an average of five tons of soil lost due to erosion per acre per year, the loss is about $10 per acre per year.

In addition to saving soil on your farm, crop rotations can provide some other tangible benefits to you or the potential operators of your farm. For example, pressure from insects and the diseases they bring can be lessened by breaking their breeding cycles. Including legumes in the crop rotation scheme can create the conditions that lead to improved soil structure and fertility, which should lead to increased crop yields. Having a more diverse list of crops within your chosen crop rotation scheme will help you spread out your financial risk because a single crop failure will not be so disastrous.

For the longer crop rotations, you may need access to equipment appropriate to work oats and alfalfa. The cost of the equipment, of course, varies depending on what you need. It’s also a good idea to investigate whether renting the equipment would make more sense financially for a new crop rotation strategy.**\***

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It’s very important to be able to estimate the potential loss of net income from a cash crop when you are considering a crop-rotation strategy. Farmers often have developed specific knowledge of their operations that they can offer as they and the next generation make their choices; they may have in-depth knowledge, for example, of which acreages are the most productive.

There also are tools available to help estimate what cash crop losses might be. The Extension Service in your state is a good place to start. For example, Iowa Extensions offers an online tool called the Ag Decision Maker on its website. It contains a Crops Page with average yields, prices, and costs for corn and soybeans in the state over the past 30 to 40 years.

In 2012, the average yield of 168 bushels and the average prices received of $6.67 per bushel would bring a total revenue estimate of $1,121 per acre. The total cost estimate of $831 per acre (a corn crop following a corn crops) leaves an estimated return of $290 per acre. Of course, the return varies each year and by state.

The link to the Iowa Ag Decision Maker is [www.extension.iastate.edu/agdm/](http://www.extension.iastate.edu/agdm/)

Links to similar sites with information for other Midwestern states can be found in Appendix 1 below.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Crop Rotation | Lowers risk of disease, insect, and weed problemsImproves soil structure and fertilityLessens soil erosionSpreads out workloadSpreads out financial risk | Equipment**\***Management efforts of $60 per acre per year (3)Loss of income from cash crop approximately $300/acre/year. Refer to the text box on **page ?** | $6/acre/year more than traditional 2-year rotation of corn/soybeans (1)$12/acre/year saved by halving herbicide usage (1)$2.10 per ton of soil loss saved per year by reducing soil erosion (2) |  |

Further Resources

**(1) Energy and Economic Returns by Crop Rotation:** Iowa State Extension [www.extension.iastate.edu/agdm/crops/html/a1-90.html](http://www.extension.iastate.edu/agdm/crops/html/a1-90.html)

*This study focuses on the energy use and economic returns of three different crop rotations. The choice of rotation depends on many factors. When considering profitability and energy consumption, including a third or fourth crop may be a viable option for some operations. Other benefits might include an outlet for excess manure, reduced erosion, increased soil health, and improved pest management.*

 **(2) Economic Measures of Soil Conservation Benefits: Regional Values for Policy Assessments,** USDA/ERS

[www.ers.usda.gov/media/196118/tb1922.pdf](http://www.ers.usda.gov/media/196118/tb1922.pdf)

*This report describes data and methodologies that the Economic Research Service uses to apply monetary values to changes in soil erosion. Values and methodology are clearly described so that analysts can apply the data to specific soil conservation projects.*

**(3) Management Estimate Per Acre**: Iowa State Extension Service

*From a conversation with ISES staff in May 2013.*

**Organic Risk Management: Rotation:** University of Minnesota

 [www.organicriskmanagement.umn.edu/rotation2.html](http://www.organicriskmanagement.umn.edu/rotation2.html)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**Value of Soil Erosion to the Land Owner:** Iowa State University Extension

[www.extension.iastate.edu/agdm/crops/html/a1-75.html](http://www.extension.iastate.edu/agdm/crops/html/a1-75.html)

*Erosion represents costs to the farmers. These costs include lost fertilizer and soil carbon. Erosion also produces costs to society borne by taxpayers. These costs are “external“ to the decisions made by the farmer. This paper estimates the costs of erosion to the land owner.*

**Soil-Fertility Management**

Adding livestock manure, either from animals on the farm or purchased nearby, is a common practice on fields in the Midwest. It helps increase the soil organic matter (SOM) content of the soil. That’s an important consideration because maintaining good SOM levels is key to growing healthy plants and high-yielding crops that are good at tolerating drought and resisting insects and diseases.

Healthy SOM levels also allow less use of fertilizer and other amendments. And increasing SOM content is the best way to decrease soil erosion; you might say it keeps the soil’s productivity from going down the drain. Keeping soil in place and adding cover crops and appropriate crop rotations also can increase the soil’s water-holding capacity and reduce sediment runoff from fields.

It does make a difference whether manure or synthetic fertilizers are used to manage soil fertility. Manure is a biologically active substance; synthetic fertilizers are not. Since soil is a living system itself, with millions of living organisms in each spoonful, it will react better to manure than to synthetic fertilizers.\*

Adding manures to the soils on your farm is one way to add organic material, which over time becomes SOM. One reason this is important is that organic matter absorbs up to six times its weight in water. You are making your ground behave like a sponge.

It is possible to add too much manure to a field over too short a time. Manure that is applied incorrectly can become a breeding ground for flies and other bugs and can contribute to water pollution. So as with other soil amendments, if you or the new operators of your farmland are going to use manures, it’s important to be prepared to do so appropriately. Your county agents and your state’s university Extension staff can be good resources.

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Increasing the SOM in a typical acre by 1% can increase its worth by $680. But it does take time. A typical soil, down to six inches, weighs about 2 million pounds per acre. That means that an increase of 1% SOM amounts to about 20,000 pounds. It takes about 10 pounds of added organic material to eventually become one pound of organic matter: 200,000 pounds of organic material would be necessary for this typical acre of soil to eventually get another 20,000 pounds of organic matter, raising the SOM by 1%. If manure were the only organic material added to this soil, and 10 tons were added each year (20,000 pounds), it would take 10 years to raise the SOM from 1% to 2%. This increase could happen faster if the crop residues were incorporated back into the soil, but even then, it would a number of years.

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| Sustainable or Conservation Ag Practice | Qualitative Benefits | Cost of Implementation of the Practice | Monetary Benefits Per Acre | Your Judgment: Value Per Acre of This Practice on Your Land  |
| Manure Management | Improves profitability by providing needed nutrients to cash crop. Crops react to biologically active manure differently than they to do fertilizer. \*Reduces fertilizer inputs  | Management efforts of $60 per acre per yearPossible equipment costs (manure spreaders can cost $15,000-$75,000) $40-$50/acre/year application costs (2) | $680/acre for each 1% increase of soil organic matter; $500 for nitrogen; $70 for phosphorus; $40 for potassium; $50 for sulfur; and $20 for carbon (1)$10/acre/year saved by reducing soil erosion with EQIP practices (5 tons of soil saved from erosion, each worth $2.10 in fertilizer value) (1)  |  |

Further Resources:

**(1) Understanding Soil Microbes and Nutrient Recycling:** North Central SARE [www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling](http://www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling)

*This fact sheet, produced by North Central Region-SARE, provides information about soil microbes, nutrient recycling, and microbial soil organic matter decomposition. It was produced in conjunction with the Midwest Cover Crops Council (MCCC).*

**(2) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(3) Management Estimate Per Acre**: Iowa State Extension Service

*From a conversation with ISES staff in May 2013.*

**Sustainable Soil Management:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=183>

*This publication covers basic soil properties and management steps toward building and maintaining healthy soils. It contains answers to why soil organisms and organic matter are important.*

**Drought Resistant Soil:** ATTRA

 <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=118>

*To minimize the impact of drought, soil needs to capture the rainwater that falls on it, store as much of that water as possible, and allow for plant roots to penetrate and proliferate. These conditions can be achieved through management of organic matter.*

**Soil Health, Organic Risk Management:** University of Minnesota [www.organicriskmanagement.umn.edu/soil\_health.pdf](http://www.organicriskmanagement.umn.edu/soil_health.pdf)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**Soil Fertility, Organic Risk Management:** University of Minnesota [www.organicriskmanagement.umn.edu/soil\_fertility.pdf](http://www.organicriskmanagement.umn.edu/soil_fertility.pdf)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**The Cost of Soil Erosion: Iowa Learning Farms** [www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Cost\_of\_Eroded\_Soil.pdf](http://www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Cost_of_Eroded_Soil.pdf)

*Erosion costs the landowner because of lost farmland productivity and potentially decreased land sales price. This study is done by the Iowa Learning Farms, which is a joint project by many of the agricultural organizations in Iowa, including Iowa State University, the Leopold Center, and the Iowa Department of Agriculture.*

**Cover Crops**

Ninety percent of grain growers use crop rotations, according to the USDA Economic Research Service, but fewer than 7% use cover crops in their rotations.

Most cover crops planted by Midwest farmers are not harvested and sold. Rather, they are planted and then chopped, mowed, or plowed down. This practice returns the nutrients and organic matter held in the crop to the soil and helps the grower reduce fertilizer costs, reduce the need for herbicides and pesticides, improve soil health, prevent soil erosion, and protect water quality. Eventually, those benefits will improve the yields of the grower’s cash crops.

Different cover crops provide different benefits; no single cover crop can provide them all. Growers, whether they have decades of experience or are the new generation on the land, must pick the benefits they most need and then choose the appropriate cover crops. The eventual improvement in cash-crop yield happens over time as the cover crops help the soils avoid erosion and build SOM.

Cover crops help build SOM by scavenging nitrogen left in the soil and converting it into food for the billions of tiny critters that live in the soil. These critters then break down the unharvested parts – stems and roots – from the previous cash crop, converting those “residues” into food for the *next* cash crop.

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As mentioned before, the soils on your farm are alive. There are more living organisms in a shovelful of soil than there are people on the Earth! These living organisms include bacteria, fungi, nematodes, earthworms and small insects. They often feed on each other, but they also work together to help build the SOM of the soil through four processes: controlling diseases, helping with plant growth, improving soil structure and recycling nutrients. The activity levels of these organisms constantly change with changes in temperature, pH, moisture and other factors. Ideally these microbes will tie up the nitrogen and other nutrients in the root zone when the plants are not growing and then mineralize the nitrogen when the plants are growing. They are the most important livestock you could ever have on your farm!

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Thus the biological, chemical, and physical properties of the soil under the cover crop all improve at the same time. Cover crops are a long-term investment similar to putting money in a mutual fund. Dramatic effects may not happen in a year or two, but over time, they will.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Cover Crops | Conserves soil moistureProtects water qualityImproves yields from enhanced soil qualityMay improve wildlife habitatHelps reduce weeds by discouraging germinationAdds valuable nutrients to the soil | Management effortsCosts of planting ($100/acre/year) and termination ($50/acre/year) (3)Possible increased risk of disease Loss of income from cash crop approximately $300/acre/yearRefer to the text box on **page ?** | $10/acre/year saved by reducing soil erosion with EQIP practices (5 tons of soil saved from erosion, each worth $2.10 in fertilizer value) (2) $38/acre/year saved by halving nitrogen fertilizer usage (1)$12/acre/year saved by halving herbicide usage (1) |  |

Further Resources:

**(1) Energy and Economic Returns by Crop Rotation:** Iowa State Extension [www.extension.iastate.edu/agdm/crops/html/a1-90.html](http://www.extension.iastate.edu/agdm/crops/html/a1-90.html)

*This study focuses on the energy use and economic returns of three different crop rotations. The choice of rotation depends on many factors. When considering profitability and energy consumption, including a third or fourth crop may be a viable option for some operations. Other benefits might include an outlet for excess manure, reduced erosion, increased soil health, and improved pest management.*

**(2) Understanding Soil Microbes and Nutrient Recycling:** North Central SARE [www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling](http://www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling)

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**(3) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**Cover Crop Decision Tools**: Midwest Cover Crops Council

 <http://www.mccc.msu.edu/selectorINTRO.html>

*This online resource has cover crops information specific to seven states and the province of Ontario.*

**Managing Cover Crops Profitably:** North Central SARE

 [www.northcentralsare.org/Educational-Resources/Books/Managing-Cover-Crops-Profitably-3rd-Edition](http://www.northcentralsare.org/Educational-Resources/Books/Managing-Cover-Crops-Profitably-3rd-Edition)

*This publication explores how and why cover crops work and provides all the information needed to build cover crops into any farming operation.*

**Using Cover Crops to Improve Soil and Water Quality:** Ohio State Extension

<http://mercer.osu.edu/topics/agriculture-and-natural-resources/Using%20Cover%20crops%20SAG%2008%2009.pdf>

*The four-page publication summarizes of all the ways cover crops help farmers improve their soil and water quality with cover crops. It presents advantages and disadvantages of cover crops and lists the different effects of cover cropping on soil and water quality.*

**Soil Fertility, Organic Risk Management:** University of Minnesota

 [www.organicriskmanagement.umn.edu/soil\_fertility.pdf](http://www.organicriskmanagement.umn.edu/soil_fertility.pdf)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers*.

**While Crop Rotations are Common, Cover Crops Remain Rare:** USDA/ERS

[www.ers.usda.gov/amber-waves/2013-march/while-crop-rotations-are-common,-cover-crops-remain-rare.aspx](http://www.ers.usda.gov/amber-waves/2013-march/while-crop-rotations-are-common%2C-cover-crops-remain-rare.aspx)

*This article from “Amber Waves,” the monthly newsletter of the USDA/ERS, presents reasons why cover cropping is somewhat rare in the Midwest and gives some suggestions about how and why to increase the use of cover crops.*

**Trees (Agroforestry)**

The kinds of trees we are going to talk about are called “working trees” by the NRCS, which defines them as “trees intentionally established in a given landscape to achieve specific functions.” These functions can include helping farmers maintain air, water, and soil quality; diversify income sources; conserve energy; improve wildlife habitats; and improve productivity.

The technical term for using trees in these ways is *agroforestry*, which is a type of production that is both forestry and agriculture at the same time. There are several ways to use these practices in a farming operation:

● Silvopasture: Picture an orchard of high-value trees where the understory — the small trees, shrubs, and other plants that grow under the tall trees — is specifically managed to produce forage that supports livestock grazing. The trees might be Christmas trees or hazelnut trees or even fruit trees, as well as trees grown for the value of their wood.

● Alley cropping: An agricultural crop that produces annual income grown in the alleys between widely space rows of trees, while the trees themselves are an investment that will produce revenue from such products as lumber and firewood as well as nuts, fruits and other crops.

● Windbreaks: Using rows of trees strategically to block wind can help reduce environmental stress on livestock and bring a farm household energy savings of $100 to $250 a year.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Agroforestry | Helps landowner diversify income sources through sales of nuts, wood, fruit, biofuels, etc.Windbreak trees can enhance the productivity of crops and livestock by providing shade during summer and protection from harsh winds in the winter (4)Enhances wildlife habitatCan help protect water quality and air quality by absorbing CO2 and releasing oxygenCan help water quality by trapping sediment before it reaches a water source | Additional management efforts Land preparation and planting costs can be $150 per acre (2)Planting costs can vary from $1,000/acre to $6,000/acre (1)Loss of income from cash crop approximately $300/acre/year.Refer to the text box on **page ?**  | Silvopasture operations can have net incomes of $150-$500 per acre per year (3)Alley cropping operations can have net incomes of $100-$2,000 per acre per year (1)Windbreaks can improve yields of protected crops by 14% as compared to unprotected crops (4)  |  |

Further Resources:

**(1) USDA National Agroforestry Center**

<http://nac.unl.edu/Working_Trees/index.htm>

*The National Agroforestry Center's popular series of* ”Working Tree” *brochures serves as an introduction to agroforestry. These color publications each illustrate various agroforestry practices that landowners can apply to help meet their production and conservation objectives.*

**(2) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(3)Profitable Farms and Woodlands:** USDA National Agroforestry Center and Tennessee State University, 2012.

*One hundred and eight page manual to help landowners develop best management technologies in managing agroforestry projects. Natural Resources Conservation Service, US Forest Service, and six other state land grant universities also were involved in developing this manual.*

**(4) Windbreak Economics:** Presentation by Larry Godsey at Greatplains Windbreak Innovation and Innovation Conference, July 2012.

**Agroforestry: An Overview:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=62>

*Integrating trees and shrubs with other enterprises on a farm can create additional sources of income, spread farm labor throughout the year, and increase the productivity of those other enterprises — all while protecting soil, water, and wildlife. This publication presents an overview of common agroforestry practices, evaluating and planning considerations, marketing opportunities, several case studies, and an extensive list of further resources.*

**Mid-American Agroforestry Working Group (MAAWG)**

<http://midamericanagroforestry.net/>

*The purpose of the Mid-American Agroforestry Working Group (MAAWG) is to provide an organization for advancing the science, practice, and adoption of agroforestry by landowners and natural resource managers in the Midwest region of the U.S. Its goals are to identify core issues for advancing the adoption of agroforestry as a cornerstone of productive land use in the Midwest and then to initiate and coordinate actions to address and resolve the core issues.*

**Working Trees: Silvopasture**: USDA National Agroforestry Center

<http://nac.unl.edu/documents/workingtrees/brochures/wts.pdf>

*A discussion of silvopasture, including components, planning, design, and management.*

**Tree as a Crop: Rodale Center**

 <http://rodaleinstitute.org/our-work/tree-as-a-crop/tree-as-a-crop-how-it-works/>

*A major project of this well-known research center, “Tree as a Crop” offers a way to put trees to work to improve ecosystems while helping to create a healthy prosperity for farmers and small forest landowners. “Tree as a Crop” shows farmers and other landowners how to maximize the potential of trees to improve biodiversity on forested and agricultural land, to capture carbon and to provide a diversified income stream for landowners.*

**Water-Quality Management**

There are sustainable agriculture practices that will go a long way toward guaranteeing that clean water is available for farm families, their livestock, and their communities.

In fact, practices we discuss in other contexts in this publication are key to maintaining or improving a farm’s water quality.

● Cover crops help hold nutrients, pesticides, and soil particles in place. They do so by cushioning the impact of raindrops and slowing down water runoff. It’s hard to overestimate how important that runoff can be: if the velocity of runoff water is cut in half, its capacity for hauling off sediment and nutrients is reduced by a *factor of 64.*

● Cover crops also can help reduce herbicide use, which will automatically improve a farm’s water quality.

● Crop rotations can help cut down nitrogen applications, reducing nitrogen runoff.

● Using gates on drainage tiles is a simple idea for reducing nitrogen runoff into streams. Such controlled drainage can reduce nitrate losses by 30%.

[INSERT GRAPHIC]



**Wetland Restoration**

Developing “targeted wetland restoration” projects is another idea to consider. They typically are put in place on areas of a farm that are not very good for growing corn or soybeans — producing yields of half or less of the farm’s average — and can reduce nitrate losses by 40% to 70%.

If such wetlands are correctly sited and designed, they can actually serve as water-quality buffers for more than one farm. In fact, the Natural Resources Conservation Service has estimated that such wetland restoration projects can save $42 per acre in “societal costs” as they eliminate soil erosion. That can make them a good way for neighbors to work together.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Wetland Restoration | Lessens nitrogen in surface runoffLessens sediment runoffMay improve wildlife habitat | Management efforts Loss of income from cash crop approximately $300/acre/year, less if using marginal cropland.Refer to the text box on **page ?**    | Savings of $42/acre in water quality improvement costs with EQIP practices. These are costs to society, not direct costs to the landowner. (1)  |  |

Further Resources:

**(1) Economic Measures of Soil Conservation Benefits: Regional Values for Policy Assessments,** USDA/ERS

[www.ers.usda.gov/media/196118/tb1922.pdf](http://www.ers.usda.gov/media/196118/tb1922.pdf)

*This report describes data and methodologies that the Economic Research Service uses to apply monetary values to changes in soil erosion. Values and methodology are clearly described so that analysts can apply the data to specific soil conservation projects.*

**Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

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[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**Practices to Improve Water Quality:** Leopold Center for Sustainable Agriculture

[www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-06-practices-improve-water-quality.pdf](http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-06-practices-improve-water-quality.pdf)

*This publication presents a brief introduction to nine practices that farmers and ranchers can use to help maintain or improve the water quality on their property. A discussion of the mechanisms of each practice is also included in this online publication.*

**Agricultural Nitrogen Management for Water Quality Protection in the Midwest:** Heartland Regional Water Coordination Initiative

[www.ksre.ksu.edu/waterquality/nitrogen%20pub.pdf](http://www.ksre.ksu.edu/waterquality/nitrogen%20pub.pdf)

*This publication provides an overview of factors influencing nitrogen loss to ground and surface waters in the four-state Heartland region of Iowa, Kansas, Missouri, and Nebraska. The Initiative is a joint project of the land grant college in each of those four states in conjunction with USDA Cooperative State Research, Education and Extension Service (now NIFA).*

**Information and video presentations of Practical Farmers of Iowa annual conference:** <http://practicalfarmers.org/events/annual-conference.html>

**Managed Grazing in Riparian Areas:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=116>

*This publication is designed to help farmers and ranchers identify and use locally appropriate grazing practices to protect riparian resources. Methods include keeping livestock from stream banks, properly resting pastures to restore degraded land, and determining the proper duration and season for grazing pastures.*

**The Cost of Soil Erosion:** Iowa Learning Farms

[www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Cost\_of\_Eroded\_Soil.pdf](http://www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Cost_of_Eroded_Soil.pdf)

*This online document provides an overview of estimated costs of soil erosion.*

**Protecting Riparian Areas, Farmland Management Strategies:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=115>

*This publication is designed to help farmers, watershed managers, and environmentalists understand what healthy riparian areas look like, how they operate, and why they are important for the environment and society. It also provides information on the costs and benefits of riparian management.*

**Protecting Water Quality on Organic Farms:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=114>

*This publication deals with environmental concerns related to organic farming in the areas of the transition period from conventional to organic, nutrient management planning practices, and improper storage of manure or compost materials. It discusses strategies for preventing water pollution by addressing those concerns.*

**Alternative Crops**

For growers in the Midwest, anything other than corn and soybeans could be considered an alternative crop. The list, not surprisingly, is almost endless. So why consider growing alternative crops in the first place? Several reasons come to mind.

● Income: This is the reason most growers decide to plant alternative crops. Growing specialty fresh fruits and vegetables, for example, can return $2,000 in income per acre if it is done correctly. These operations do not require much acreage; 100 acres would be considered a large vegetable farm in the Midwest. To run a direct marketing operation, where the new operators would sell directly to the public, typically involves less than 30 acres. These fresh produce operations are riskier than cash grain operations and require much more hired labor. If you are interested in having part of your land dedicated to fresh produce, you probably should talk to the vegetable specialists at the land grant college in your state.

● Forages and feed. Alternative crops can provide both for livestock on the farm. Adding grazing operations can also help you provide wildlife habitat.

● Soil improvement. Some crops that can be sold — such as alfalfa, peas, and snap beans — also will improve the farm’s soil.

 Alternative crops also can help reduce disease and insect problems, as well as diversify a farming operation to spread income out more evenly during the year.

New generations of farmers may have crops in mind that have never been grown on the land before. Without the experience of the retiring farmer to rely on, how can the potential for alternative crops be evaluated? It takes a plan. Preferably, the retiring farmer and the new farmer can work together on the plan, but it should contain specific steps:

* Reasons, expressed as goals for the operation, to consider specific crops
* An evaluation of the resources they will need to produce these specific crops. For example, a small tractor may be required for growing vegetables
* A list of experienced farmers, Extension offices, and trade associations that can help with production or marketing issues
* An assessment of whether the scale of the proposed operations line up with the experience of the new farmers. For example, if they have never grown vegetables, it might be unreasonable for them to assume that they will be able to handle growing 20 acres or more of vegetables to start out.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Alternative Crops | May reduce pesticide useImproves soil and water qualityEnhances wildlife habitat and diversity | Capital Investment in equipmentManagement effortsHired laborWorking capital requirements | Specialty fruits and vegetables have net income up to $2,000/acre/year(1)Dry peas and beans have net income up to $300/acre/year (2)Sunflowers, millet, amaranth and other specialty grains have net incomes up to $300/acre/year (2) |  |

Further Resources:

**(1) Ag Decision Maker, Iowa Fruit and Vegetable Production Budgets:** Iowa State University Extension

 [www.extension.iastate.edu/agdm/crops/html/a1-17.html](http://www.extension.iastate.edu/agdm/crops/html/a1-17.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(2) Minnesota Specialty Crops, An Analysis of Profitability and Performance:** Minnesota Department of Agriculture

[www.mda.state.mn.us/~/media/Files/food/organicgrowing/specialtycrop2012.ashx](http://www.mda.state.mn.us/~/media/Files/food/organicgrowing/specialtycrop2012.ashx)

*This study was done for the Minnesota Department of Agriculture and contains the financial summaries from 47 Minnesota farms. It is intended to give growers (and potential growers) some of the hard data they need to help decide which fruits and vegetables might fit their operations. Existing growers can also use this data to compare their returns to the averages generated by the growers in the study.*

**Crop Insurance Options for Specialty, Diversified and Organic Farmers:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=413>

*This publication reviews federally subsidized crop insurance, with special attention to options available to specialty, diversified, and organic farmers. It gives special attention to understanding whole-farm revenue insurance options, which may be of particular interest to growers of diverse specialty and organic crops and livestock.*

**Alternative Agronomic Crops:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=84>

*This publication provides an overview of the considerations involved in selecting, cultivating, and marketing alternative agronomic crops. Many additional resources for alternative crop information are referenced in this publication.*

**Horticulture Crops as Alternative Crops:** ATTRA

<https://attra.ncat.org/horticultural.html>

*This series of six publications offers detailed information on production of specific horticultural crops, focusing on sustainable and organic production methods for traditional produce and also introducing a range of alternative crops and enterprises. It includes information on strategies for more sustainable greenhouse and field production of everything from lettuce to trees.*

**Organic Risk Management:** University of Minnesota

[www.organicriskmanagement.umn.edu/alternative\_crops.pdf](http://www.organicriskmanagement.umn.edu/alternative_crops.pdf)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**Perennial Forages/Grazing**

Operations that include livestock likely have pastures for grazing and hay fields for baling, and there are practices that could improve their productivity. Alfalfa, for example, can be grown as a perennial crop rather than just in rotation with corn and soybeans. It is the most widely used perennial forage legume in the Midwest region and can be grazed or baled for hay.

You may be passing on land that, like many operations, produces grains with no animals on the farm. Perennial forages and grazing are sustainable practices can still work within a total farm plan, and you may want to look into ways to make that happen on your farm when it comes time to transition to new owners.

There are a number of programs operated by the Natural Resources Conservation Service that could provide some incentives to help make the shift to more conservation minded practices such as perennial pastures. Some examples include the Conservation Reserve Enhancement Program (CREP), the Conservation Reserve Program (CRP), the Conservation Stewardship Program (CSP) and the Grassland Reserve Program (GRP). Your local NRCS office can help you or the land’s new owners determine which programs might work for your land.

While changing the use of the land on your operation may affect its future sale or rental value, including perennial forages in place of cash grains will not represent a complete loss of income for the new owners — particularly when the acreage shifted to forage is marginal corn or soybean land.

Rather than producing poor grain or soybean yields, such land potentially could generate income from these perennial crops. Selling high-quality alfalfa hay to dairy farmers or horse owners can be very profitable, for example. Even simple contracts for grazing a neighbor’s cattle could increase net income by $100 to $150 per acre per year.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Perennial Forage/Grazing | Increases soil fertility with legumes, which take nitrogen from the air into the soil where it is used by the cash cropEnhances soil quality and fertility because less tillage means better soil structure along with less loss of carbon and nitrogen Reduces weed pressure because less weed seed will germinateEnhances water filtration because of better soil structure and tilthLessens erosion because the roots hold the soil in place | Management effortsLoss of net income from cash crop up to $300/acre/yearRefer to the text box on **page ?**Up to $ 150/acre for establishment (2) | Grazing land lease of $100-$150 per acre per year (3)Hay production up to $300/acre/year (3)$10/acre/year saved by reducing soil erosion with EQIP practices (5 tons of soil saved from erosion, each worth $2.10 in fertilizer value) (1) |  |

Further Resources:

**(1) Understanding Soil Microbes and Nutrient Recycling:** North Central SARE [www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling](http://www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling)

*This fact sheet, produced by North Central Region-SARE, provides information about soil microbes, nutrient recycling, and microbial soil organic matter decomposition. It was produced in conjunction with the Midwest Cover Crops Council (MCCC).*

**(2) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(3) Ag Decision Maker, Crops-Costs and Returns:** Iowa State Extension [www.extension.iastate.edu/agdm/cdcostsreturns.html](http://www.extension.iastate.edu/agdm/cdcostsreturns.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**Organic Risk Management, Forages:** University of Minnesota [www.organicriskmanagement.umn.edu/forages.pdf](http://www.organicriskmanagement.umn.edu/forages.pdf)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**Pasture and Rangeland Management During Drought:** ATTRA <https://attra.ncat.org/downloads/water_quality/drought_mgmt.pdf#search=forages>

*This PowerPoint presentation illustrates some common-sense guidelines on how to manage livestock during a drought. It also talks about strategies that can be implemented before a drought starts that could make life easier for a rancher when the eventual drought conditions do begin.*

**Pollinator/Beneficial Insect Habitats**

One of the biggest stories in the agricultural press during the last several years has been the decline of domesticated honey bee populations all over the United States. There are some disagreements about the reasons for these declines, but there is no disagreement that they are happening. One of the strategies to counter such declines is to increase the populations of wild bees. One way to do so is to plant and maintain habitats that promote and protect wild bees by providing nectar and pollen.

These habitats can be created by using marginal or poor cropland, so the loss of income from corn or soybeans will not cost much in comparison to the benefits. The habitats will attract and promote not only wild bees; they will do the same for other beneficial insect species. These beneficial species include many different wasps, beetles, lacewings, predatory mites, flies, and just plain bugs. Keeping these bugs around can help reduce pesticide applications.

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| **Sustainable or Conservation** **Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Pollinator/Beneficial Insect Habitat | Pollinators are critical to productivity of many fruit, vegetable, seed, and nut cropsBeneficial insects provide pollination and prey on other harmful insectsBeneficial-insect habitat can improve productivity of nearby crops and reduce problems from insect pests | Loss of income from cash crop approximately $300/acre/year, possibly less if using marginal cropland Refer to the text box on **page ?**One-time costs of establishing habitat up to $150/acre (1) | Reduces costs of insecticide applications up to $50/acre/year (1) $29/acre from pollination This is not a monetary value that accrues to the landowner. Instead it is a societal benefit, estimated from pollinator services from all farms in the US. (2)  |  |

Further Resources:

**(1) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(2) Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregrate Data for the Period 1992-2009:** Public Library of Science (PLOS), May, 2012.

*This study was funded by the National Honey Board and gives an in-depth analysis of the directly pollinated and indirectly pollinated crops in the U.S., with detailed financial estimates of both.*

**Alternative Pollinators: Native Bees**: ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=75>

*This publication provides information and resources on how to plan for, protect and create habitat for native bees in agricultural settings.*

**Using Farm Bill Programs for Pollinator Conservation, Technical Note No. 78:** The Xerces Society

[www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf](http://www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf)

*More than 30 percent of our food relies on insect pollination, which is overwhelmingly provided by bees.*

*Native bees have declined due to habitat loss and the careless use of pesticides, and managed colonies of European honey bees have suffered a 50 percent decline in recent decades. This publication offers ideas for farmers about using NRCS programs to help abate this staggering loss of bees.*

**Wildlife-Habitat Management**

Many of the principles for managing habitats for beneficial insects and for perennial forages also apply to this sustainable agriculture practice.

For example, should you as a retiring farmer or the new owners or operators of your farm convert poor or marginal crop land to wildlife habitat, it will not completely eliminate their sources of income from those acres.

Even before turning the land over to the new generation, you can start by doing such things as establishing native grasslands to provide water, cover, food, and space for whatever wildlife species you want to encourage, for example, quail, pheasants, grouse, ducks, geese, or deer. Or you might plant certain trees in specific areas to encourage bird migration – not only game birds – to your place.

The local NRCS office can be really helpful in this process by providing maps of your farm that will help in deciding which acres to convert and how to convert them. They also have conservation programs you might want to investigate.

As with habitat for beneficial insects, establishing wildlife habitat could affect your land’s future rental or sale value, so careful planning is essential. But if such habitat is part of the legacy you would like to leave as a good steward of the land who is concerned with benefitting the local community, starting the process can set the stage for the new owners or operators to have the option of possible leasing land for hunting or bird watching or eco tourism as new sources of income.

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| **Sustainable or Conservation** **Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Wildlife Habitat | Can help reduce erosionCan help reduce nitrogen and phosphorus runoff, which will help water qualityProvides habitat for pollinator insectsCan increase land’s economic potential as site for hunting and bird watching | Up to $100/acre for prairie seed mix (3)Up to $50/acre for disking and planting (2)$32-$50/acre/year in maintenance costs (2)Loss of income from cash crop approximately $300/acre/year, possibly less if using marginal cropland  Refer to the text box on **page ?** | Hunting lease income of $100/acre/year of enough acres are available (4)$10/acre/year saved by reducing soil erosion with EQIP practices (5 tons of soil saved from erosion, each worth $2.10 in fertilizer value) (1) |  |

Further Resources:

**(1) Understanding Soil Microbes and Nutrient Recycling:** North Central SARE [www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling](http://www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling)

*This fact sheet, produced by North Central Region-SARE, provides information about soil microbes, nutrient recycling, and microbial soil organic matter decomposition. It was produced in conjunction with the Midwest Cover Crops Council (MCCC).*

**(2) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(3) Using Farm Bill Programs for Pollinator Conservation, Technical Note No. 78:** The Xerces Society

[www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf](http://www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf)

*More than 30 percent of our food relies on insect pollination, which is overwhelmingly provided by bees.*

*Native bees have declined due to habitat loss and the careless use of pesticides, and managed colonies of European honey bees have suffered a 50 percent decline in recent decades. This publication offers ideas for farmers about using NRCS programs to help abate this staggering loss of bees.*

**(4) Integrating Hunting and Grazing:** Leopold Center for Sustainable Agriculture [www.leopold.iastate.edu/grants/2003-e6](http://www.leopold.iastate.edu/grants/2003-e6)

*Land resources in Iowa are limited, yet there is increased interest in both improved wildlife habitat and hunter access to these lands. The study looks at ways to achieve these goals without shortchanging area farmers.*

**A Landowner’s Guide to Prairie Conservation Strips:** Leopold Center for Sustainable Agriculture [www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-08-landowners-guide-prairie-conservation-strips.pdf](http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-08-landowners-guide-prairie-conservation-strips.pdf)

*Prairie conservation strips are a tool for improving the function and integrity of row-cropped farms. Strategically planting small patches and strips of native prairie in farmland provides multifunctional benefits disproportional to the amount of land converted. In other words, small patches make a big difference.*

**Farmlands and Wildlife:** Penn State College of Agricultural Sciences <http://pubs.cas.psu.edu/FreePubs/pdfs/agrs104.pdf>

*This manual is written to emphasize the importance of agriculture in maintaining habitat for wildlife. It is also meant as a guide to farmland wildlife, habitat management methods and their benefits, methods of wildlife damage control, sources of financial assistance for habitat projects, and additional educational resources.*

**Organic Certification**

Any – or all – of the practices in this publication can be part of an organic farm operation. The important aspects of crop rotations, soil-fertility management, cover crops, and water-quality management are all mandatory for an organic farmer.

What makes a farm organic – and allows the farmer to receive price premiums (sometimes substantial) for goods in the marketplace – is the use of production practices specified by the requirements of the USDA’s National Organic Program. By following these regulations and then undergoing an annual inspection by a certified inspector, farmers can receive organic certification.

A new farmer may be excited about the possibility of creating a certified organic operation, but certification brings investments and regulations as well as rewards.

One of the most daunting is the three-year transition period usually required by the regulations before the land can be certified. The transition period is probably is the most difficult time for a producer to be profitable because she has to spend a lot time creating a land-use plan and interacting with the certifying agency. And then she has to execute her plan on farmland that may react to the new land usage techniques in unexpected ways.

It might be part of the legacy you would like to leave that the land, which may have been in your family for many years and could soon belong to someone else, will become more fertile and more environmentally friendly. But you probably also want to know that the land will stay in agricultural production and that it will be profitable for the new owners or farmers.

The transition to organic production is a serious commitment, however, and it would be helpful for you to investigate further what it entails so you can evaluate how important it is to your farm-transfer plan.

If you are transferring your family land to a new operator and are interested seeing it farmed in a way that could allow it to get certified, you might consider a farm-transfer plan that starts with lower payments for the new owner. That way she would have more financial breathing room and more of an opportunity to make the investments required to become certified.

Many farms have successfully made the transition – almost 18,000 farming operations in the United States are currently certified organic. Wisconsin is home to more than 1,000 certified organic producers. Minnesota, Iowa, and Ohio each have nearly as many. It can be done.

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| **Sustainable or Conservation Ag Practice** | **Qualitative** **Benefits** | **Cost of Implementation of the Practice** | **Monetary Benefits Per Acre** | **Your Judgment: Value Per Acre of This Practice on Your Land**  |
| Organic Certification | Reduces pesticide and herbicide use (5)Improves water and soil quality (5)Reduces soil erosion (5)Reduces nitrogen and phosphorus runoff (5)Improves wildlife habitats (5) | Management effortsOrganic certification costs of $750-$2,000 depending on certifying agency (4)Costs for certified seeds and fertilizers can be double those of conventional products (4)Plowdowns of cover crops can cost $ 50 per acre per year (3)Loss of income from cash crop approximately $300/acre/year, possibly less depending on profit from organic crop. Refer to the text box on **page ?** | Price premiums for all crops sold vary between 20% and 100% (4)$10/acre/year for reducing soil erosion (5 tons of soil saved from erosion, each worth $2.10 in fertilizer value) (2)Avoided costs of synthetic fertilizers and pesticides up to $140 per acre per year (1) |  |

Further Resources:

**(1) Energy and Economic Returns by Crop Rotation:** Iowa State Extension [www.extension.iastate.edu/agdm/crops/html/a1-90.html](http://www.extension.iastate.edu/agdm/crops/html/a1-90.html)

*This study focuses on the energy use and economic returns of three different crop rotations. The choice of rotation depends on many factors. When considering profitability and energy consumption, including a third or fourth crop may be a viable option for some operations. Other benefits might include an outlet for excess manure, reduced erosion, increased soil health, and improved pest management.*

**(2) Understanding Soil Microbes and Nutrient Recycling:** North Central SARE [www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling](http://www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling)

*This fact sheet, produced by North Central Region-SARE, provides information about soil microbes, nutrient recycling, and microbial soil organic matter decomposition. It was produced in conjunction with the Midwest Cover Crops Council (MCCC).*

**(3) Ag Decision Maker, Whole Farm Decision Tools:** Iowa State Extension

[www.extension.iastate.edu/agdm/decisionaids.html](http://www.extension.iastate.edu/agdm/decisionaids.html)

*This online toolbox created by Iowa State Extension helps farmers answer hundreds of “what if” questions about their operations and about possible new enterprises. Worksheets are available to evaluate production decisions, marketing decisions, machinery questions, etc.*

**(4) Guide for Organic Crop Producers: ATTRA and USDA NOP**

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=67>

*New farmers, as well as farmers experienced in conventional agriculture, often find that obtaining organic certification for their crops is quite challenging. This guide is intended to help lead farmers through the organic certification process.*

**(5) Organic Risk Management: Rotation:** University of Minnesota

 [www.organicriskmanagement.umn.edu/rotation2.html](http://www.organicriskmanagement.umn.edu/rotation2.html)

*This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. This manual covers a wide range of production topics that are relevant to organic farmers.*

**Guide for Organic Livestock Producers**

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=154>

*This guide is an overview of the process of becoming certified organic. It is designed to explain the USDA organic regulations as they apply to livestock producers.*

**Organic System Plan Template for Crops and Livestock:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=359>

*The forms in this package are provided as tools that farmers can use for documenting practices, inputs, and activities to demonstrate compliance with regulations or to assist in other aspects of farm record keeping.*

**Organic Crop Production Overview:** ATTRA

 <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=66>

*This guide provides an overview of the key concepts and practices of certified organic crop production. It also presents perspectives on many of the notions, myths, and issues that have become associated with organic agriculture over time. A guide to useful ATTRA resources and to several non-ATTRA publications is provided.*

**Nutrient Management in Organic Small Grains:** ATTRA

 <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=384>

*This publication provides information on sources of fertility for organic small grains that are acceptable according to the National Organic Program standards.*

**Soil Management: National Organic Program Regulations:** ATTRA

<https://attra.ncat.org/attra-pub/summaries/summary.php?pub=180>

*The National Organic Program Rule, §205.203, Soil Fertility and Crop Nutrient Management Practice Standard, does not define specific land practices that producers must use. But it does identify general soil management and environmental protection objectives. This publication provides management guidelines for meeting, and measurable parameters for monitoring, these objectives.*

**USDA National Organics Program**

[www.ams.usda.gov/AMSv1.0/NOPNationalOrganicProgramHome](http://www.ams.usda.gov/AMSv1.0/NOPNationalOrganicProgramHome)

*The internal pages of the National Organics Program website give detailed descriptions of every aspect of the Program. Most sections have a FAQ sheet and there are numerous Fact Sheets that address specific topics about the NOP.*

**Conclusion**

All these sustainable practices overlap and can become parts of one overall farm-management philosophy. These practices come together to help optimize the health of soils, water resources, crops, animals, farm families, and communities. And this includes the *economic* health of farm families and their communities.

Even though you may no longer be farming in the near future, you can help guarantee that the new operators will be successful financially while incorporating sustainable agriculture practices into their operation. You may need to consider creative financing options like variable rent payments to allow for reduced incomes in the first years of transition to the new operators.

You may want to investigate some of the options mentioned in this publication’s companion piece “Conservation Financing,” such as deed restrictions and covenants, agricultural conservation easements and irrevocable trusts. But if you are truly interested in promoting sustainable agriculture and land conservation as your operation changes hands, you probably need to talk to other landowners and legal advisors about finance. There are many ways to leave your legacy of being a great steward of your land to the next generation, whether the new owners are part of your family or not. You can do this.

[START TEXT BOX]

USDA conservation programs are administered by the Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS) which are accessible throughout the nation in county and regional field offices called USDA Service Centers. Find the USDA Service Center nearest to you at<http://offices.sc.egov.usda.gov/locator/app>

USDA Natural Resource Conservation Service conservation programs:

* + Wetland Reserve Program [www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/)
	+ Grasslands Reserve Program [www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/grassland/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/grassland/)
	+ Healthy Forests Reserve Program[www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/)
	+ Farm and Ranch Lands Protection Program[www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/farmranch/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/farmranch/)
	+ Environmental Quality Incentive Program [www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/)
	+ Conservation Stewardship Program[www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/)

USDA Farm Service Agency conservation programs:

* + Conservation Reserve Program[www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp](https://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp)
	+ Transition Incentive program[www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=tipr](http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=tipr)

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**APPENDIX 1: Sources of Enterprise Budgets for Midwestern States**

Illinois

<http://web.extension.illinois.edu/iidea/resource/financing.htm>

Indiana

<https://ag.purdue.edu/agecon/Pages/default.aspx>

Iowa

[www.extension.iastate.edu/agdm/cdfirst.html](http://www.extension.iastate.edu/agdm/cdfirst.html)

Kansas <http://search.ksre.ksu.edu/index.htm?qt=CORN+ENTERPRISE+BUDGETS&site=http%3A%2F%2Fwww.ksre.ksu.edu%2Fp.aspx%3Ftabid%3D124>

Michigan

<http://fieldcrop.msu.edu/>

Minnesota

[www1.extension.umn.edu/agriculture/corn/](http://www1.extension.umn.edu/agriculture/corn/)

[www.soybeans.umn.edu/home.htm](http://www.soybeans.umn.edu/home.htm)

Missouri

[www.fapri.missouri.edu/farmers\_corner/budgets/](http://www.fapri.missouri.edu/farmers_corner/budgets/)

Nebraska

<http://www1.unl.edu/search/?q=enterprise+budgets&submit=Go&u=http%3A%2F%2Fwww.extension.unl.edu%2F>

North Dakota

[www.ag.ndsu.edu/ndsuag/gsearch?cx=018281009562415871852%3Ajpqauwrs0sa&cof=FORID%3A10&ie=UTF-8&q=enterprise+budgets&sa=+&siteurl=www.ag.ndsu.edu%2Fndsuag%2Fcrops%2Feconomics&ref=www.ag.ndsu.edu%2Fndsuag%2Fcrops&ss=176j30976j2](http://www.ag.ndsu.edu/ndsuag/gsearch?cx=018281009562415871852%3Ajpqauwrs0sa&cof=FORID%3A10&ie=UTF-8&q=enterprise+budgets&sa=+&siteurl=www.ag.ndsu.edu%2Fndsuag%2Fcrops%2Feconomics&ref=www.ag.ndsu.edu%2Fndsuag%2Fcrops&ss=176j30976j2)

Ohio

<http://aede.osu.edu/research/osu-farm-management/enterprise-budgets>

South Dakota

[http://igrow.org/search/CORN+PROFITABILITY/?q=CORN+PROFITABILITY](http://igrow.org/search/CORN%2BPROFITABILITY/?q=CORN+PROFITABILITY)

Wisconsin

<http://corn.agronomy.wisc.edu/Season/DSS.aspx>

 **Worksheet options:**

**PUTTING IT ALL TOGETHER!**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sustainable Practice** | **Acreage estimated for this practice (refer to map)** | **Annual net benefit or net cost due to this practice, per acre** | **Acres x Net Value (or Cost) from practice** | **Total whole-farm net value (or cost) of implementing the practice** |
| Crop Rotation |  |  |  |  |
| Manure Application |  |  |  |  |
| Cover Crops |  |  |  |  |
| Trees (agroforestry) |  |  |  |  |
| Wetland Restoration |  |  |  |  |
| Alternative Crops |  |  |  |  |
| Perennial forages/grazing |  |  |  |  |
| Pollinator/beneficial insect habitat |  |  |  |  |
| Wildlife habitat mgmt. |  |  |  |  |
| Organic Certification |  |  |  |  |
| TOTALS |  |  |  |  |

|  |
| --- |
| **Sustainable Practice \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
| Practice and location on land | Individual Monetary Costs | Total Monetary Costs | Individual Monetary Benefits | Total Monetary Benefits |
|  | Year 1Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 1 | Year 1Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 1 |
|  | Year 2Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 2 | Year 2Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 2 |
|  | Year 5Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 5 | Year 5Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  | Year 5 |
|  | Year 10Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Cost \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 10 | Year 10Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Benefit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  | Year 10 |
| By subtracting the annual costs from the annual benefits, the operator can track the monetary effect of each sustainable practice.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Anticipated Non-Monetary Benefits to Land and Operation After 10 Years: |

|  |
| --- |
| **Sustainable Agriculture Practice:** |
| Added Income Practice Would Bring  | Added Costs Practice Would Bring |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Reduced Costs Practice Would Bring | Reduced Income Practice Would Bring |
|  |  |
|  |  |
|  |  |
|  |  |
| Subtotal | Subtotal |
| Net Change: (Subtract subtotal of right-hand column from subtotal of left-hand column |
| Anticipated Non-Monetary Benefits to Land and Operation After 10 Years: |