**VALUING SUSTAINABLE AGRICULTURE PRACTICES**

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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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So if that’s what sustainable agriculture is, now you might be wondering just what it looks like. Well, not every operation is the same; there are many ways farmers and ranchers can make it happen. Here are just a few examples.

● A cattle rancher might divide his pastures into paddocks within a rotational grazing system to better manage water resources and soil fertility.

● A corn and/or bean grower might use cover crops such as alfalfa and rye for weed suppression. And at the same time, she could start a 5-acre vegetable patch to sell produce directly to local consumers or to the local school district.

● Maybe they could plant trees as windbreaks or for wildlife habitat purposes.

● Or a farming operation might adopt similar practices and also get certification for organic production – thus becoming eligible for price premiums in the marketplace.

Every farm and ranch in the Midwest has the opportunity to adopt some, or many, sustainable agriculture practices. We will take a look at 10 possible strategies and some ideas about evaluating whether they will work on a given operation:

* 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 to use them in an operation. And once growers determine which practices could be both useful and valuable, they can begin researching exactly how to adopt them – or talking to family members about whether to adopt them.

Please read Hannah Lewis’s draft piece on Conservation Financing. I think that she hits exactly the right note in terms of audience.

**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 probably already second nature to anyone 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 annually, including diesel fuel, 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).

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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 problems  Improves soil structure and fertility  Lessens soil erosion  Spreads out workload  Spreads out financial risk | Possible additional equipment  Additional management efforts | $6/acre/year more than traditional 2-year rotation of corn/soybeans  $12 saved by halving herbicide usage |  |
| Further Resources:  **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)  **Organic Risk Management: Rotation**, University of Minnesota, [www.organicriskmanagement.umn.edu/rotation2.html](http://www.organicriskmanagement.umn.edu/rotation2.html) | | | | |

**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.

Good soil-testing procedures are necessary for guiding soil-improvement efforts. The soil in fields that are not producing as expected should be tested every year to see what nutrients are missing and to determine how efforts to build SOM levels are progressing. Fields that are producing well probably need soil testing only every two or three years. Soil-fertility management involves many specific sustainable-agriculture practices, and we look next at one of the most important – cover crops.

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| Soil-Fertility Management | Improves profitability by providing needed nutrients to cash crop  Reduces fertilizer and pesticide inputs  Lessens water runoff  Improves drought tolerance by cash crop  Reduces soil erosion | Additional management efforts  Possible additional equipment | $680/acre for each 1% increase of soil organic matter  $18/acre/year saved by reducing soil erosion with EQIP practices |  |
| Further Resources:  **Sustainable Soil Management**, ATTRA, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=183>  **Drought Resistant Soil**, ATTRA, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=118>  **Soil Health, Organic Risk Management**, University of Minnesota, [www.organicriskmanagement.umn.edu/soil\_health.pdf](http://www.organicriskmanagement.umn.edu/soil_health.pdf)  **Soil Fertility, Organic Risk Management**, University of Minnesota, [www.organicriskmanagement.umn.edu/soil\_fertility.pdf](http://www.organicriskmanagement.umn.edu/soil_fertility.pdf)  **Understanding Soil Microbes and Nutrient Recycling**, North Central SARE, 2010, [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)  **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) | | | | |

**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 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.

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 savings account. 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 | Reduces fertilizer costs  Reduces herbicide and pesticide inputs  Improves soil-erosion prevention  Conserves soil moisture  Protects water quality  Improves yields from enhanced soil quality  May improve wildlife habitat | Additional management efforts  Additional costs of planting and termination  Possible increased risk of disease | $18/acre/year saved by reducing soil erosion with EQIP practices  $38/acre/year saved by halving nitrogen fertilizer usage  $12/acre/year saved by halving herbicide usage |  |
| Further Resources:  Cover Crop Decision Tools, from the Midwest Cover Crops Council. Has cover crops information specific to seven states + province of Ontario. <http://www.mccc.msu.edu/selectorINTRO.html>  **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)  **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>  **Soil Fertility: Organic Risk Management**, University of Minnesota [www.organicriskmanagement.umn.edu/soil\_fertility.pdf](http://www.organicriskmanagement.umn.edu/soil_fertility.pdf)  **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,-cover-crops-remain-rare.aspx)  **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) | | | | |

**Trees (Agroforestry)**

Everybody loves trees. They look beautiful. They give us shade and provide homes for birds. And some of them give us good things to eat. 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 fancy 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 incorporate these practices into 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 grown in the alleys between widely-spaced rows of trees provides an annual income, while the trees themselves produce long-term revenues.

● Windbreaks. Using rows of trees strategically to block wind can help reduce environmental stress on livestock and help a farm household use less energy.

Who couldn’t use more trees on the farm? These are just a few of the many creative applications for trees on farms. A possible niche application, for example, is “forest farming” – growing trees for wood along with a specialty product such as ginseng or mushrooms on the forest floor.

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| Agroforestry | Helps landowner diversify income sources  Windbreak trees can enhance the productivity of crops and livestock  Enhances wildlife habitat  Can help protect water quality and air quality | Additional management efforts  Land preparation and planting costs  Possible loss of income | Up to $500/acre/year? depending on how trees are used (Windbreaks have minimal dollar value, while trees harvested for wood or used in alley cropping could generate net returns of $500/acre/year.) |  |
| Further Resources:  **Agroforestry: An Overview**, ATTRA, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=62>  **Mid-American Agroforestry Working Group**, <http://midamericanagroforestry.net/>  **USDA, National Agroforestry Center**, <http://nac.unl.edu/Working_Trees/index.htm>  **Working Trees: Silvopasture**, USDA, National Agroforestry Center, <http://nac.unl.edu/documents/workingtrees/brochures/wts.pdf>  **Trees as a Crop**, Rodale Institute, <http://rodaleinstitute.org/our-work/tree-as-a-crop/tree-as-a-crop-how-it-works/> | | | | |

**Water-Quality Management**

Everybody loves (and needs) good, clean water. 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%, according to Iowa State University Biosystems Engineering Department staff.

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 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. That can make them a good way for neighbors to work together.

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| Wetland Restoration | Lessens fertilizer use  Lessens nitrogen in surface runoff  Lessens sediment runoff  May improve wildlife habitat  Aesthetics |  | Savings of $42/acre in water quality improvement costs with EQIP practices (These are costs to society, not direct costs to the landowner.) |  |
| Further Resources:  **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)  **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)  **Managed Grazing in Riparian Areas**, ATTRA, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=116>  **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)  **Protecting Riparian Areas: Farmland Management Strategies**, ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=115>  **Protecting Water Quality on Organic Farms,** ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=114> | | | | |

**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.

● Extra income: This is the reason most growers decide to plant alternative crops. Growing specialty fresh fruits and vegetables, for example, can add $2,000 in income per acre if it is done correctly.

● Forages and feed. Alternative crops can provide both for livestock on the farm.

● 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.

All of these are valid reasons to consider alternative crops. Growing an alternative crop is by definition a new undertaking, at least initially. But growers should be cautious. First, they should identify goals as a guideline for choosing particular alternative crops. Then they should assess their resources to see what they need and how to get it. For example, a smaller tractor may be required for growing vegetables.

The next step is to make an effort to get connected, either in person or virtually, with others who have experience growing the same crops. This could be neighbors or a county extension agent or someone in a trade association. These contacts can help develop an estimated budget for production costs and crop yields.

The next step may be the most important: develop a marketing plan for the alternative crops. For example, it is true that growing fresh market vegetables can be lucrative, but only if they are sold in the right place at the right time. Even with today’s growing interest in local produce, beautiful tomatoes do not sell themselves on the farm.

Finally – and this cannot be overstated – start small. There’s no reason for growers to lose their shirts trying to diversify farm income. If this year’s alternative crop production goes well, there’s always next year to increase production.

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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 use  Improves soil and water quality  Enhances wildlife habitat and diversity  Spreads out work load  Spreads out financial risk | Additional equipment  Additional management efforts  Additional hired labor  Additional working capital requirements | Specialty fruits and vegetables have net income up to $2,000/acre/year  Dry peas and beans have net income up to $300/acre/year  Sunflowers, millet, amaranth and other specialty grains have net incomes up to $300/acre/year |  |
| Further Resources:  **Crop Insurance Options for Specialty, Diversified and Organic Farmers**, ATTRA, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=413>  **Alternative Agronomic Crops,** ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=84>  **Horticulture Crops as Alternative Crops**, ATTRA, <https://attra.ncat.org/horticultural.html>  **Organic Risk Management**, University of Minnesota, [www.organicriskmanagement.umn.edu/alternative\_crops.pdf](http://www.organicriskmanagement.umn.edu/alternative_crops.pdf)  **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)  **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) | | | | |

**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.

Many clovers can be used as alternatives to alfalfa on heavy soils that have a low pH. (Remember, accurate soil testing is always part of any sustainable agriculture practice.) Possibilities for grass pastures include reseeding them with clovers, vetches, or, in wet areas, birdsfoot trefoil. These legume-grass mixtures can help maximize how resources are utilized. Legumes have long taproots and are more drought tolerant than grasses. Legumes also fix nitrogen, and since grasses require nitrogen for better growth, they help each other in a mixed pasture. Also, animals that graze on a mixed pasture will have less of the bloating that can be caused by ruminants eating only legumes. Finally, mixtures can provide better weed control.

A good principle to stick with here is to start small and simple; growers should begin with a legume and a grass they know are the most productive in the area. For farms that don’t already have livestock, the idea of perennial forages for hay or grazing might really be something new. This is where growing forages for hay could be considered another alternative crop. Rather than producing poor grain or soybean yields, marginal or poor crop land could potentially generate more income from these perennial crops. Selling high-quality alfalfa hay to dairy farmers or horse owners can be very profitable. 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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| Perennial Forage/Grazing | Increases soil fertility with legumes  Enhances soil quality and fertility  Reduces weed pressure  Enhances water filtration  Lessens erosion | Additional management efforts  Possible additional equipment  Loss of net income from cash crop up to $400/acre/year  Up to $ 150/acre for establishment | Grazing land lease up to $120/acre/year  Hay production up to $300/acre/year  $ 18/acre/year saved by reducing soil erosion with EQIP practices |  |
| Further Resources:  **Organic Risk Management:** Forages, University of Minnesota, [www.organicriskmanagement.umn.edu/forages.pdf](http://www.organicriskmanagement.umn.edu/forages.pdf)  **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)  **Management During Drought**, ATTRA, <https://attra.ncat.org/downloads/water_quality/drought_mgmt.pdf#search=forages>  **Pasture Health and Drought Protection**, ATTRA, <https://attra.ncat.org/downloads/water_quality/healthy_pastures.pdf#search=forages> | | | | |

**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. The best way to do so is to plant and maintain habitats that promote and protect wild bees by providing nectar and pollen. Generally, the plants to select should be local ecotypes that bloom in the spring, summer, and fall. The plants species should not be overly aggressive, and the flowers of the plants should be of many shapes and sizes.

These habitats can be created by using marginal or poor cropland. They 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 crops  Beneficial insects provide pollination and prey on other harmful insects  Beneficial-insect habitat can improve productivity of nearby crops and reduce problems from insect pests | Loss of income from cash crop up to $300/acre/year  One-time costs of establishing habitat up to $150/acre | Reduces costs of insecticide applications up to $50/acre/year,  $29/acre from pollination |  |
| Further Resources:  Also include the Alternative Pollinators: Native Bees publication from ATTRA.  **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) | | | | |

**Wildlife-Habitat Management**

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

Preparing areas on your farm that create native grasslands is one of the best ways to provide effective habitat for farmland wildlife. Four ingredients are necessary to bring native wildlife to a farm: water, food, cover, and space. Water sources could be as simple as dew collecting on a pasture or native plants that produce berries. Maintaining the quality and flow of water through creeks and ponds, and even marshes, also is important. Food sources for wildlife could include insects, plants, seeds, and other animals. Wildlife needs cover for shelter, nesting, resting, and escaping predators. The animals also need space for feeding and mating.

Most farms probably already have many of the components needed for a good wildlife-management program. Determining the types of wildlife to promote and maintain is the first step in determining a plan. Over time it will be possible to manipulate the components of a farm to favor a particular species or type of animal.

It will be helpful to get or develop a property map to locate the component areas of the plan. Such maps are available from county water districts or local NRCS offices. With the map, planning can begin for such practices as delaying the mowing of pastures until late summer, establishing stands of both warm- and cool-season grasses, planting legumes, incorporating Integrated Pest Management strategies, and reducing the nutrient runoff from upland croplands, among others. Eventually, farms may even establish areas to lease out to hunters or birdwatchers as another source 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 erosion  Can help reduce nitrogen and phosphorus runoff, which will help water quality  Provides habitat for pollinator insects  Can increase land’s economic potential as site for hunting and bird watching  Aesthetics | Up to $100/acre for prairie seed mix  Up to $50/acre for disking and planting  $32-$50/acre/year in maintenance costs  Cost of taking land out of corn/soybean | Hunting-lease income of $100/acre/year if enough acres are available  $18/acre/year in soil-erosion reduction |  |
| Further Resources:  **Integrating Hunting and Grazing**, Leopold Center for Sustainable Agriculture, [www.leopold.iastate.edu/grants/2003-e6](http://www.leopold.iastate.edu/grants/2003-e6)    **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)  **Farmlands and Wildlife**, PennState College of Agricultural Sciences, <http://pubs.cas.psu.edu/FreePubs/pdfs/agrs104.pdf> | | | | |

**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. And a good soil-testing program is even more important for organic farmers.

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 USDAS National Organic Program. By following these regulations and then undergoing an annual inspection by a certified inspector, farmers can receive organic certification.

For farmers who make the choice to become certified organic producers, the required three-year transition period probably is the most difficult time. Because corn demands a high level of nutrients, most advisors will suggest starting the transition to organic with some other crop. For example, it’s probably a good idea to grow alfalfa or red clover for a couple of years before growing a corn crop. These crops decrease weed pressure and also will provide natural nitrogen for the corn crop that follows. According to researchers at Iowa State University, even soybeans can be grown during transition years without suffering yield losses.

The transition to organic production is a serious commitment, and farmers should carefully study what it entails. But 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  Improves water and soil quality  Reduces soil erosion  Reduces nitrogen and phosphorus runoff  Improves wildlife habitats | Additional management efforts  Organic certification costs | Price premiums for all crops sold vary between 20% and 100%  $18/acre/year for reducing soil erosion |  |
| Further Resources: We could probably save some space here by just directing people to the ATTRA landing page for organic ag.  **Guide for Organic Crop Producers,** ATTRA and USDA NOP, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=67>  **Guide for Organic Livestock Producers,** ATTRA and USDA NOP, <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=154>  **Organic System Plan Template for Crops and Livestock**, ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=359>  **Organic Crop Production Overview**, ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=66>  **Nutrient Management in Organic Small Grains**, ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=384>  **Soil Management: National Organic Program Regulations**, ATTRA,  <https://attra.ncat.org/attra-pub/summaries/summary.php?pub=180>  **Organic Risk Management**, University of Minnesota [www.organicriskmanagement.umn.edu/default.htm](http://www.organicriskmanagement.umn.edu/default.htm)  **USDA National Organics Program** [www.ams.usda.gov/AMSv1.0/NOPNationalOrganicProgramHome](http://www.ams.usda.gov/AMSv1.0/NOPNationalOrganicProgramHome) | | | | |

**Conclusion**

It’s easy to see how 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. Incorporating sustainable agriculture practices into a farm system is not intended to be a tradeoff: less money for cleaner air and other benefits. Rather, these practices can help growers make more money by farming in a different way.

It’s not necessary for farmers to stop growing corn and beans; they can add cover crops, longer crop rotations, and maybe even some perennial forages. They can stop buying so many off-farm inputs and keep fertilizers on the farm and in the crops, where they do the most good. They can grow some fruits and vegetables for sale in local and regional markets. It is possible to “do well by doing good” and be financially successful while helping make the local environment a better place.

**We weren’t sure what the worksheet should look like; here are a couple of options:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **AGROFORESTRY** | | | | |
| Practice and location on land | Individual Monetary Costs | Total Monetary Costs | Individual Monetary Benefits | Total Monetary Benefits |
|  | Year 1  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 1 | Year 1  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 1 |
|  | Year 2  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 2 | Year 2  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 2 |
|  | Year 5  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 5 | Year 5  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 5 |
|  | Year 10  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Cost \_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 10 | Year 10  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_  Benefit \_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Year 10 |
| 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: | |