Farm Transitions Toolkit

September 2013

Land Stewardship Project
Minnesota Institute for Sustainable Agriculture
National Center for Appropriate Technology
Farmers' Legal Action Group

landstewardshipproject.org
www.misa.umn.edu
www.ncat.org
www.flaginc.org

Acknowledgements

AUTHORS
Jane Grimsbo Jewett, Minnesota Institute for Sustainable Agriculture
Hannah Lewis, National Center for Appropriate Technology
Alex Baumhardt, Land Stewardship Project
Farmers' Legal Action Group

CONTRIBUTORS
Robert Maggiani, National Center for Appropriate Technology
Rich Myers, National Center for Appropriate Technology

EDITORS
Brian DeVore, Land Stewardship Project
Jane Grimsbo Jewett, Minnesota Institute for Sustainable Agriculture
Karen Stettler, Land Stewardship Project
Cathy Svejkovsky, National Center for Appropriate Technology

PROJECT TEAM

Amy Bacigalupo	Land Stewardship Project
Terra Brockman	The Land Connection, Author, The Seasons on Henry's Farm
Gary Hachfeld	University of MN Extension
Dean Harrington	Foresight Bank, Plainview
Amanda Heyman	Fare Grange Law Office, LLC
Jan Joannides	Renewing the Countryside
Joy Kirkpatrick	University of Wisconsin Center for Dairy Profitability
LouAnne Kling	Farm Advocate; Farm Transitions Coach
Jack LaValla	Riverland Community College; Farm Business Management instructor
Bill McMillin	Grass-fed Beef Producer & Land Stewardship Project Member, Plainview
John Mesko	Sustainable Farming Association of Minnesota
Helene Murray	Minnesota Institute for Sustainable Agriculture
Brett Olson	Renewing the Countryside
Vicki Poier	Conventional Farmer; Land Stewardship Project Member, Montevideo area
Kent Solberg	Sustainable Farming Association, Livestock & Grazing Specialist
Susan Stokes	FLAG (Farmers Legal Action Group)

REVIEWERS
Craig Chase, Leopold Center for Sustainable Agriculture, Iowa State University
Helene Murray, Minnesota Institute for Sustainable Agriculture
Brian Schoenborn, Attorney, Leonard, Street and Deinard Law Firm
Audrey Arner, Moonstone Farm, Montevideo, MN
Carmen Fernholz, A-Frame Farm, Madison, MN
Ann Lemke, Fresh Air Farm, Watkins, MN
Helen Bettendorf, St. Cloud, MN

ADVISERS
John Baker, Iowa State University Beginning Farmer Center; Richard Cates, Center for Integrated Agricultural Systems, University of Wisconsin-Madison; Craig Chase, Iowa State University Extension and Outreach; Ed Cox, Drake Agricultural

Law Center, Drake University; Tim Delbridge, University of Minnesota; Gary Hachfeld, University of Minnesota Extension; Ann Johanns, Iowa State University Extension and Outreach; Rob King, University of Minnesota; Carl Little, National Center for Appropriate Technology; Jeri Neal, Leopold Center for Sustainable Agriculture, Iowa State University; Teresa Opheim, Practical Farmers of Iowa

Funding and staff support for this project was provided by Land Stewardship Project through a USDA Beginning Farmer and Rancher Development grant; the Minnesota Institute for Sustainable Agriculture; and the National Center for Appropriate Technology.

"This toolkit would not have been possible without the expertise and energy offered by Minnesota Institute for Sustainable Agriculture (MISA) staff Jane Grimsbo Jewett and Helene Murray. In addition, Jane's dedication to guiding the process of researching information, engaging writers and reviewers along with her own researching and writing has made this toolkit possible. Thank you, Jane and Helene.

"The topic of farm transitions is broad and complex. The advisory committee members and reviewers shared their expertise from diverse backgrounds and served a key role in guiding and reviewing the form and content of the toolkit. Thank you to all.

"This project was supported by the Beginning Farmer and Rancher Development Program of the National Institute of Food and Agriculture, USDA, Grant # 2010-03107. To find more resources and programs for beginning farmers and ranchers please visit www.Start2Farm.gov, a component of the Beginning Farmer and Rancher Development Program."

------ Karen Stettler, Land Stewardship Project, September 30, 2013.

Additional copies of this item may be ordered from the Minnesota Institute for Sustainable Agriculture, 411 Borlaug Hall, 1991 Upper Buford Circle, St. Paul, MN 55108, email: misamail@umn.edu, phone: 612-625-8235 or 800-909-6472. Also available in full text online at: landstewardshipproject.org/farmtransitionstoolkit.org .

Partial funding for this project provided by the Land Stewardship Project, National Center for Appropriate Technology, Minnesota Institute for Sustainable Agriculture and USDA-Risk Management Agency.

Table of Contents

Index of Valuing Sustainable Practices Text Boxes: Page

Index of Cost/Benefit Tables: Page

Perspectives from the Land Stewardship Project:

Since 2010, Land Stewardship Project (LSP) staff members have talked to hundreds of beginning and retiring farmers and professionals about transitioning land to the next generation of farmers. During these visits, a few questions consistently emerged:

- Retiring farmers were saying, "I know I should be doing some planning for the future; where do I start? Are there *really* beginning farmers who want to farm?"
- Both beginning and retiring farmers asked "How do we find each other?"
- Financial planners said, "I wish I had more tools for clients thinking about next steps with their land– what are people doing and what is working?"

In response to these questions, LSP envisioned this toolkit to share the best examples and resources available for farmers and landowners who are seeking to transition their land to a beginning farmer.

LSP continues to work to better understand what is needed for farmland to be transitioned to the next generation of farmers. There are many challenges facing farmers today. Some solutions can be found on an individual level, and others are deep societal problems that require collective organizing. Our work on both of these fronts is guided by a steering committee of beginning and retiring farmers.

In this introduction, we want to illustrate the importance of farm transitions, describe opportunities for beginning farmers, and detail next steps for you to consider while considering a transition.

The Need for Successful Farm Transitions

Healthy rural communities, strong farm businesses, continued land stewardship—all of these things result from successful farm transitions. These things benefit us all: the retiring farmer, the beginning farmer and the communities that surround them. With the percentage of older farmers on the rise, it is projected in the next 20 years 70 percent of ranchland and farmland will change hands (www.uvm.edu/farmlasts/projectexecutivesummary.pdf).

Without proactive planning by individuals and communities, the Midwest will lose the family farms that are the cornerstone of its economy and culture. Farmers are already seeing these alarming trends: mega-farms are gobbling up all available land and bulldozing the homestead, investors are padding their portfolios with farmland, and family farmers struggle to find available and affordable land.

These problems are deep and solving them will require equally deep structural change. At the same time, retiring farmers have an opportunity to determine the legacy of their farm by planning their farm transition and potentially providing a beginning farmer with a once-in-a-lifetime chance to start farming.

Opportunity for Beginning Farmers

Beginning farmers represent a lot of opportunity. They can operate strong businesses, care for the land and be an active part of vibrant rural communities. At a time when many small towns are experiencing a decline in population, these new communities members can contribute to schools, places of worship, and local government and organizations. In addition, good food, grown locally and sustainably by family farmers, is increasingly valued by eaters and businesses. These eaters are willing to pay organic premiums that provide a living wage for farmers, which in turn contribute to a vibrant Main Street. Established farmers and rural communities also have an opportunity. They can start TODAY by envisioning the future they desire for their farms and towns, and laying out a plan to establish that vision. What would it look like if a county supported three new farms each year? What if every farm had a transition plan in place? What is your vision for your farm, the land and your community?

Taking Action

It is never too early to determine your legacy and start planning for the future of your farm, whether you are a farmer, a landowner or someone with farmland in your family. This toolkit provides a starting point for this important process. It contains resources and links to services to help you establish a plan.

This toolkit also contains examples of successful farm transitions. It's important to share the creative and inspiring solutions farmers and landowners are using around the region. We would love to hear your farm transition story—please contact Karen Stettler (contact information below) to share!

Get Started

- Use this toolkit to start planning for the future of your farm.
- Give us feedback: let us how this toolkit helped you and what we should add.
- Tell *your* story: share your vision for your farm or transition experience with your neighbors, customers, faith community and more. If you want some help, please contact Karen Stettler (contact information below).
- **Join the Land Stewardship Project today.** A future for family farmers requires both individual and collective action. Our members throughout the Upper Midwest are organizing for a farming system that puts people and the land first—your

participation matters. Join by calling Karen Stettler or visit the LSP website and click on the “Join” button.

For more information, contact:

Karen Stettler
Land Stewardship Project organizer, Lewiston, MN
507-523-3366
stettler@landstewardshipproject.org

Farm Transitions Introduction

Welcome to the Farm Transitions Toolkit! A "farm transition" means that the responsibility for a piece of agricultural land is changing hands. Maybe the ownership of the land will change. Maybe that ownership will move from one generation to the next in the same family. Maybe ownership will move from one family to a different one. Maybe ownership of the land will stay the same, but different people will be in charge of operating the farm and making the day-to-day decisions. The transition might happen quickly, or it might happen gradually over a period of months or years.

Whatever the case, this *Farm Transitions Toolkit* offers information, advice, and help to plan those changes. It's a complex project that takes effort and communication from family members and others, but planning for the farm transition just might be the most important thing you can do for your land. What's it all about and how can this *Toolkit* help? We'll start with the basic "5W+H" questions: Who, What, When, Where, Why and How?

Who?

Who are you? Are you a:

- Retiring Farmer
- A farmer who isn't ready to retire yet
- Spouse of a farmer
- Child or other heir of a farmer
- Non-farming owner of agricultural land
- Spouse of a non-farming landowner
- Child or heir of a non-farming landowner
- Legal or financial adviser to a farmer or landowner

All of these kinds of people have a stake in the process of transitioning a farm into new hands. Any one of these folks can be the champion, or the "spark" that starts the process.

What?

What should you do?

Farmers and farmland owners should create a plan for the passing of farm property into new hands. The plan should ensure that both the elder generation and the heirs are treated fairly; that the new farmers starting out on the land have a reasonable chance to make it financially; and that the land will be cared for in the way that your family wants it to be cared for.

When?

When should you make a plan?

It's never too early to start educating yourself and family members about the options for farm transitions. Even if the family isn't ready, yet, to put a formal plan in place – even if no one else wants to talk about it – RIGHT NOW is a good time to start learning and laying some groundwork for future discussions. There is no time that's too early, but there are times that are too late. Some of our stories of farm transitions situations are cautionary tales about what can happen if planning is delayed too long.

Where?

Of course, your plan will focus on your family's farm property and wherever that happens to be located, but it's useful to take a look at that property through the lens of farm transition planning. Where does that property lie in relationship to major urban areas, to recreational areas, to farm infrastructure and services (such as co-ops and elevators), and to human services (such as schools, grocery stores, and hospitals)? All of these things have an impact on the value of the property, how interested a younger generation may be in carrying on the farm operation, and what sort of programs you can access to help with financing the farm transition.

Why?

Why go through sometimes difficult family conversations to try to put together a farm transition plan?

The more you can communicate with family members and with advisers (legal and financial), the more likely that the farm transition can be accomplished satisfactorily, without anyone being caught by surprise. Worthy goals like keeping the farm in the family, or keeping a lifetime of conservation practices intact when the farm changes hands, aren't likely to happen by accident. They take some work, and they take some level of agreement from all of the parties with an interest in the property, and in almost all cases they take some legal documents.

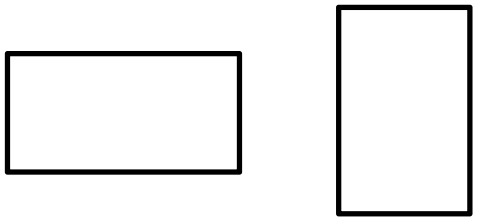
How?

How should you get started on your Farm Transitions plan?

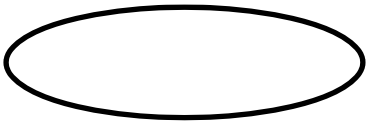
There's not really a wrong place to start. Every family is different. Take a look at the diagram on page 8, pick a question or an idea that seems like it would resonate with your

family, and start from there. You don't have to read this document straight through from start to finish. It's set up so that you can start in various places and jump around.

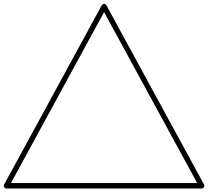
Key to the Graphic on page 8:



Rectangular boxes contain things that need to be discussed within families.



Ovals show resources that can help with your farm transition – human resources, and online and print sources of information.

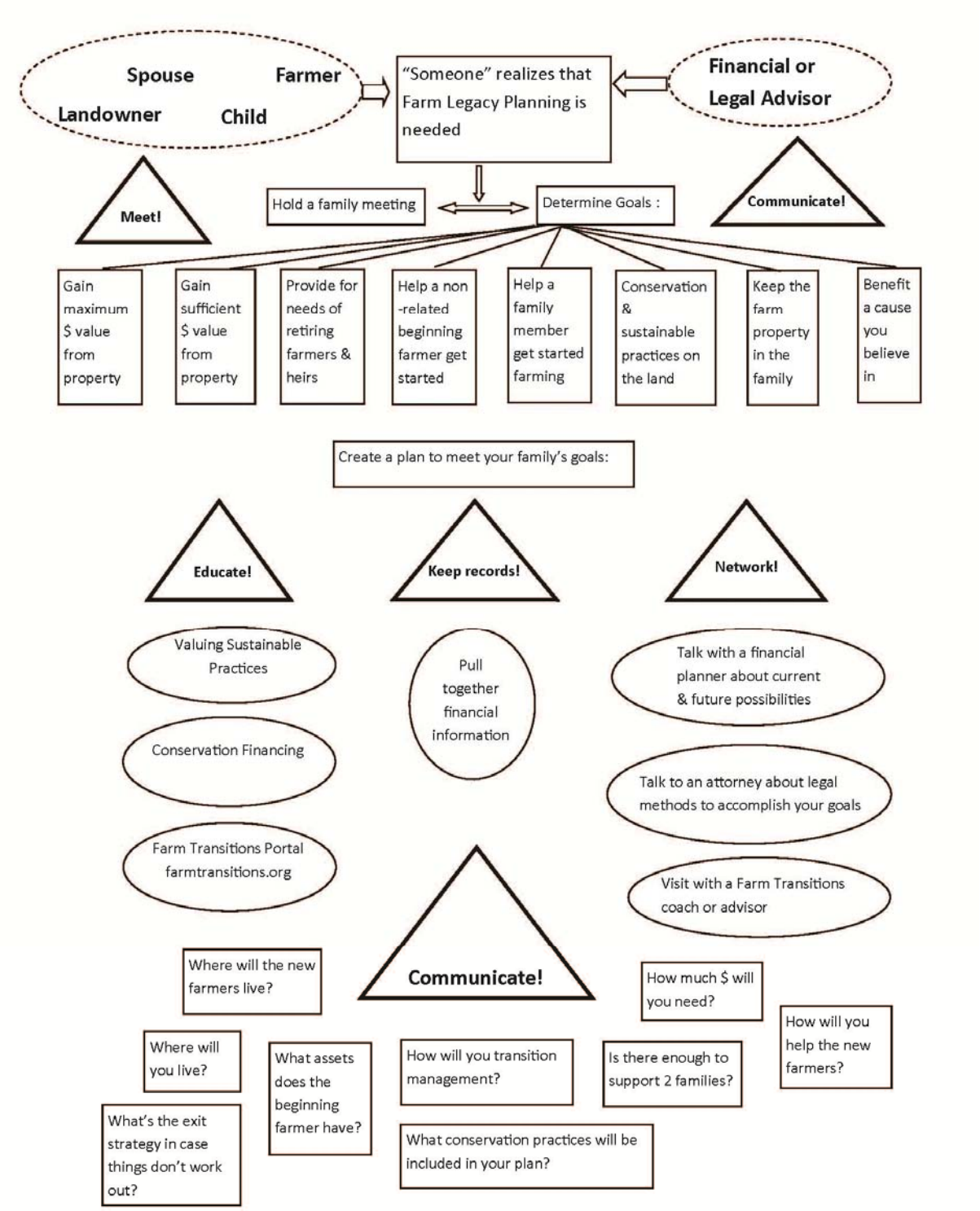


The triangles show things to especially attend to throughout your farm transition process. Failure to do them can slow down or stop the process.

Don't know where to start?

If you're feeling overwhelmed and need to talk to a real person instead of reading fact sheets and looking at charts, there's help available! Visit the Farm Transitions Portal at www.farmtransitions.org to find a list of farm transitions coaches and advisers.

Getting Started with Farm Transitions: Pick Any Place to Start Your Family's Discussion



Family Conversation Topics

The farm transitions conversations are difficult for a lot of families. One farm adviser recommends starting the conversation over Thanksgiving dinner: "Please pass the potatoes. What's your plan for passing on the farm?"

Here are some questions that need to be asked and answered during the process of planning a farm transition. They don't all have to be answered at once. Pick the one that seems easiest to your family, and start there.

Also see the Getting Started Diagram for more ideas about Farm Transitions starting points.

Where will you live?

Where will the new farmers live?

How much money will you need?

Is there enough to support two families?

How will you help the new farmers?

How will the new farmers help you?

What assets does the beginning farmer have?

What is the exit strategy in case things don't work out?

What conservation practices will be included in your plan?

How will you transition management of the farm operation?

Family Goals

Part of the family conversation should include a discussion of goals for the farm transition. Different family members are going to have different needs and desires. Whether your family makes decisions by consensus, or by a vote with input from all members, or by a decision of the senior generation; it is still important to understand the varying goals that family members may have.

Also see the Getting Started Diagram for more ideas about farm transition starting points.

Some possible farm transition goals:

- Gain maximum dollar value from the property
- Gain sufficient dollar value from the property
- Provide for needs of retiring farmers & heirs
- Help a family member get started farming
- Help a non-related beginning farmer get started
- Conservation and sustainable practices on the land
- Keep the farm property in the family
- Benefit a cause you believe in

Family goal-setting activity:

It can be hard to start up a family conversation about goals and have everyone comfortable about being honest. One fun and painless method to get started is to have people vote anonymously, using colored dot stickers.

Here's how:

At a family gathering --perhaps over the holidays -- print out these goals on sheets of paper. Put them someplace where people can get to them easily, perhaps on a bathroom wall, and give everyone a set of dot stickers. Ask your family members to "vote" by putting stickers on the goals of their choice.

Forming a Farm Transitions Plan

If your family's goal for your land includes some conservation practices, or some sustainable agriculture practices, then the rest of this publication will show and describe some tools that can help you put together a plan that will work.

Conservation Financing describes legal mechanisms and financial arrangements that will allow you to take your family's goals and ideas for their land, and turn those into reality.

FLAG Fact Sheets – from Farmers' Legal Action Group – provide details about two common legal methods for dealing with transfers of farmland and farm operations: contracts for deed and long-term leases.

Valuing Sustainable Practices provides detailed information and sample calculations on ten common conservation and sustainable agriculture practices. This background information will help you decide what practices make sense and are affordable for your situation. Worksheet tables in each section allow you to calculate the costs and benefits of each practice for your own land, which can create the basis for a fair farm transition plan that will meet your family's goals.

Farm Transitions Profiles are stories of beginning farmers and retiring farmers who found innovative ways to accomplish the transfer of land and farming operations.

All of the information in this publication is intended to support, not to replace, conversations that you need to have with professional legal and financial advisers. Use this Toolkit to learn about the tools that are available, to learn some of the language used by legal and financial advisers, and to develop the outlines of what you want to see happen with your land – but then take your plan to the professionals who can help you make it happen.

Contact the Land Stewardship Project for assistance in finding a legal adviser, financial adviser, or Farm Transitions Coach:

Karen Stettler
Land Stewardship Project organizer, Lewiston, MN
507-523-3366
stettler@landstewardshipproject.org

Conservation Financing

By Hannah Lewis
National Center for Appropriate Technology (NCAT) Agriculture Specialist
August 2013

Abstract

Farmland owners are in a wonderfully unique position to protect water, soil, and wildlife now and long into the future. The purpose of this publication is to offer guidance to farmland owners on the farm transfer process when conservation and sustainable agricultural practices are desired. A variety of farm-transfer tools that can help landowners achieve these conservation goals are discussed below.

This list of tools is not intended to be a complete or definitive list. Instead, this list identifies some of the most well-known and commonly used methods. Also, the information in this document is broad and general. You should consult directly with professionals in the field to get specific legal and financial advice for your own situation.

Contents

Introduction

Many landowners, whether retiring from a lifelong career of farming or inheriting land from parents who farmed, want to leave a legacy of conservation and sustainable agriculture. As a landowner, you may be looking for ways to pass on the farm to a farmer and/or new owner who shares this vision. For retiring farmers and off-farm landowners alike, there are many ways to do this, depending on the value and priorities of the particular landowner.

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

For instance, some landowners want to keep the farm in the family, while others hold this as a lower priority or perhaps don't have a family heir. Another consideration is the extent to which landowners want to stay connected to the land over time. Farmland transfer involves transferring equity, management, and income potential to the next generation. Some landowners are ready to part with all of these rights and responsibilities at once, while others prefer a more gradual process, or perhaps depend on the income from renting the land. Whether transferring the land by selling, leasing, gifting, willing it through an estate plan, or a combination of these methods, landowners can include provisions to encourage and/or ensure conservation practices.

Still another goal landowners may have—and one that may tie in nicely with the desire to promote sustainable agriculture—is to help a beginning farmer get started. While often a limiting factor for beginning farmers is lack of land and capital, they can in exchange offer: energy; time; a certain level of knowledge, skills, and experience; a shared commitment to sustainability and conservation in some cases; and access to USDA beginning farmer loans and related resources.

Indeed, a ground swell of support for local, sustainable agriculture has swept forward a variety of initiatives to support these farmers financially and otherwise. The Slow Money movement is an example of how beginning farmers can tap into a greater community commitment to sustainable agriculture. The basic concept that socially-minded individuals or groups can lend their money or invest it in sustainable farmers is taking shape in communities throughout the country. While landowners should be aware of these options as assets that the beginning farmer brings to the table, the remainder of this publication focuses on what the landowner can do to encourage sustainable agriculture in the process of farm transfer.

Methods of Farm Transfer				
	Sale	**Lease**	**Gift**	**Estate plan**
Mechanisms to Facilitate Conservation Outcomes	• Contract for deed • Deed restriction • Restrictive covenant • Agricultural conservation easement • Splitting land to sell part at market rate and part for conservation or alternative uses	• Long-term lease with conservation provisions • Conservation incentives through cost sharing and/or risk sharing • Option to buy and/or right of first refusal	• Gift of land to a land trust (estate tax burden lifted on that property)	• Revocable or irrevocable trust with provisions for conservation • Bequest to a land trust or nonprofit

Selling Land

Selling a farm outright may be the most limited option in terms of ensuring conservation stewardship since, unless otherwise specified in a deed restriction, you lose all interest and claim to the land once the sale is complete—even if it's to a family member. However, you do have control over how and to whom you advertise the sale. For instance, if you sell at auction, the land will simply go to the highest bidder. On the other hand, if you advertise it with a LandLink program or through a listing offered by a sustainable agriculture organization, you have an opportunity to attract conservation-minded farmers, especially if you already have features on the land such as organic certification, buffer strips, rotational grazing, etc. You could even interview potential buyers to get a feel for their vision for the land.

Further resources:

> **FarmLink** programs facilitate farm transfer by providing services to help connect retiring farmers or landowners with beginning farmers. Programs are listed by state. www.farmtransition.org/netwpart.html

Selling a Portion of the Land to a Sustainable Farmer

Depending on how much land you have and how it's configured, an option may be to

separate out a portion of the property with a greater conservation value to transfer to a sustainable farmer. Perhaps this portion would consist of a farmstead and surrounding land. This arrangement allows the flexibility to sell some land at top dollar on the open market in order to achieve financial objectives, while creating more favorable terms for a sustainable farmer on another part of land. If your successor is raising horticultural crops and/or small livestock, it's possible that he or she doesn't need or even want more than a couple dozen acres.

Contract for Deed

With a *contract for deed* sale, the landowner sells the land on contract over the course of several years to a beginning farmer, who makes periodic payments with interest over that period of time. The terms of the contract can include specific language about conservation standards and/or allowable agricultural practices, similar to provisions that might be spelled out in a long-term lease (see below). A contract for deed sale may be of interest to beginning farmers who are unable to obtain financing from more traditional sources. In addition, a seller/landowner could consider assisting a beginning farmer by offering more favorable terms than a bank, such as a lower interest rate or lower down payment. A potential financial benefit to the landowner is the ability to spread any capital gains tax from the sale out over many years.

A contract for deed arrangement tends to work best between a seller and buyer that have a solid and trusting relationship, since there are many risks involved for both parties, particularly the buyer. Title to the land is held by the landowner until the final payment is made, and none of the payments up to that point count toward equity in the farm for the purchaser; defaulting on the loan means forfeiting all previous payments. The USDA Farm Service Agency offers a Land Contract Guarantee Program. If the buyer misses payments, the seller is protected from loss. The program is intended to make landowners more willing to take the risk of selling their land to a beginning farmer.

Further resources:

Contract Land Sales. 2012. National Sustainable Agriculture Coalition http://sustainableagriculture.net/publications/grassrootsguide/farming-opportunities/contract-land-sales/

Frequently Asked Questions on Contracts for Deed in Minnesota. 2012. Farmers Legal Action Group (FLAG) www.flaginc.org

Installment Sale Contracts for Beginning Farmers. 2011. Partnership for America's New Farmers. Drake University and Drake University Law School. http://americasnewfarmers.org/installment-sale/

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

Land Contract Guarantee Program. Farm Service Agency, USDA www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=pfs&newstype=prfactsheet&type=detail&item=pf_20120120_farln_en_lcgrnt.html

Agricultural Conservation Easement

Owners of farmland near the edge of large metropolitan areas can consider getting an *agricultural easement* on their land before selling it. This would restrict current and future use to agriculture and potentially lower the purchase price for a beginning farmer. An easement reduces the market value of the land by preventing it from ever being developed for residential or commercial purposes.

Easements can serve a variety of conservation purposes, such as protecting farmland from urban sprawl, ensuring historic or cultural preservation, or creating permanent protection of wilderness or scenic areas. The conservation provisions of any given easement depend on the priorities of the landowner granting the easement as well as those of the organization or agency that will hold and enforce the easement. Therefore, an agricultural easement could specify the types of agricultural practices allowed on the land, such as organic production or particular conservation practices. Such provisions could be similar in language to the conservation provisions one might include in a long-term lease (see below).

But, unlike a long-term lease, since an easement is meant to last forever it should be created in a way that it can be interpreted and implemented over time, regardless of societal or environmental changes. Experts in the field recommend not requiring specific agricultural practices in the easement. The future is unpredictable—few in 1930 could have predicted what we can now do with electricity and computers, for instance—and getting too specific with requirements can lead to unnecessary burdens on future owners of the land. Instead, the easement should be viewed as your vision for what should happen with that land in fairly general terms that will allow future landowners to take advantage of new knowledge and new technologies that could help achieve that vision.

Where land prices are driven by agriculture (rather than development), agricultural easements do not necessarily lower the price and may therefore be less useful in facilitating transfer to a beginning farmer. Another caveat is that easements are not ubiquitously available since the eligible nonprofit organizations and government agencies that handle them are not evenly spread out across the country. Nor does every piece of land necessarily qualify for an easement. Often, the conservation value of the land is taken into consideration before a decision is made by an easement holder to accept a donation of an easement. Where an easement is an option for a landowner, a financial incentive to do so is a reduction in his or her estate tax.

Further resources:

Land Trust Alliance, a national conservation nonprofit organization, has an online database of state, local, and national land trusts operating throughout the United States. http://findalandtrust.org/

U.S. Department of Agriculture (USDA) has a variety of conservation easement programs that provide financial and technical assistance to landowners to restore and provide long-term protection to different types of agriculture lands. These include the Wetland Reserve Program (WRP), Grassland Reserve Program (GRP), Healthy Forest Reserve Program (HFRP), and the Farm and Ranch Land Protection Program (FRPP), all of which are listed at www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements .

Deed Restriction or Restrictive Covenant

Similar to an easement, a *deed restriction* limits how the land can be used by the subsequent owner. A deed restriction is easier to create than an easement, but it is not as enforceable and may not offer long-term protection. A *restrictive covenant* is a type of deed restriction (or it can be another form of written agreement) that applies to two or more people on neighboring land for their mutual benefit; these parties are also mutually responsible for enforcing the rules of the covenant. A restrictive covenant applies to current and future owners of the land, although some covenants are not perpetual.

A mutual covenant could potentially be a way to create a sustainable agriculture cluster or community by selling land to a group of owners who will hold each other accountable to upholding the terms of the covenant by using conservation and sustainable agricultural practices.

Further resources:

Conservation Easement vs. Deed Restriction. 2008. Land Trust Alliance Fact Sheet. www.landtrustalliance.org/conservation/documents/CE-deed-restriction.pdf

Long-Term Leases

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

Most landowners are familiar with an annual cash rent, which is appealing in that it's simple, familiar, requires little planning and offers flexibility to the landowner to adjust the rent annually. However, annual cash rent does little to build the long-term landlord-tenant relationships that are conducive to expanding conservation and sustainable farming practices on the land. With a little extra research and planning, even an off-farm landowner with little knowledge of farming can establish a *long-term lease*. Furthermore, you can gain the financial benefits of annual cash rent with a long-term lease by using a rent adjustment calculation that ties the annual rental rate to commodity prices and land values.

Establishing a long-term lease is a great way to facilitate conservation because it provides security to the farm operator that investments made in the soil today will benefit that same

operator in the future. Furthermore, for the farm operator to qualify for USDA's Conservation Stewardship Program (CSP), he or she must have control of the land for the full five years of a CSP contract. Farm operators must also demonstrate control of land for Environmental Quality Incentives Program (EQIP) contracts, which vary in length from one to 10 years.

For the retiring farmer/landowner, a long-term lease is a legal instrument for putting a vision for how the land should be managed into writing. This vision can be spelled out in the form of a comprehensive conservation plan accompanying the lease, with a provision requiring that the conservation plan be followed. Alternatively, a lease can include specific provisions related to crop rotation, pest-management practices, use of riparian buffers, etc.

Sample conservation provisions
(excerpted from Drake Agricultural Law Center's Sustainable Farm Lease, www.sustainablefarmlease.org)

- The Tenant will leave a vegetative buffer ___feet from any watercourse, stream, or river.
- A cover crop shall be seeded on corn ground harvested for silage.
- If any fieldwork is done in the fall, at least two-thirds of the soil will be left covered with crop residue.
- Tenant will figure credits for manure and previous legume crops before applying additional nutrients.
- Tenant agrees to minimize use of herbicides by employing integrated weed strategies as the primary means of weed control.
- Tenant agrees to minimize use of insecticides by employing pest-management strategies as primary means of pest control.
- Tenant agrees to implement a haying/grazing plan approved by NRCS or landowner.

To encourage adoption of sustainable practices, the lease can also include cost-sharing and/or risk-sharing terms for tenant and landlord to collaborate on in making these improvements. *Crop sharing*, wherein a portion of the harvested crop is paid as rent instead of cash, is a way to spread the risk of implementing new practices between landlord and tenant. *Flexible cash rent* is another way to share risk by tying the annual rental rate to the annual yield or total revenue. Landowners can also split costs with tenants for inputs such as cover crop seeds, certifications, or new equipment needed to implement sustainable practices.

Renting land is a good option for new farmers because it's more affordable and less risky than buying land, at least for the first few years of farming. In addition, landowners may choose to offer a graduated rent to help a cash-poor beginning farmer get started. This would involve discounting the rent in the first year and increasing it over the next few years to full market rate. Some Midwestern states (Iowa, Nebraska and Wisconsin, for example) offer tax credits to landowners who lease land to a beginning farmer, which could offset the cost to a landowner.

A lease can be a stepping stone in the farm-transition process, after which the beginning farmer is ready to buy the land. There are a few ways to prepare for an eventual sale coming out of a long- term lease. The lease agreement can include a *Purchase Option*, wherein the landowner and tenant set a purchase price up front and rent payments made over the course of the lease period can count toward a down payment. Alternatively, the lease can include a Right of First Refusal for the tenant, meaning the land can be sold to a third party only after the tenant has had a chance to purchase the land by matching that third party's offer.

Options for Setting the Rent

Rent-Setting Option	**Benefits**	**Drawbacks**
Annual Cash Rent	• Easy to understand and implement • Maximum $ each year to landowner • Maximum flexibility for landowner	• Discourages long-term land stewardship practices • May not be affordable for ***some*** conservation or alternative crop practices (on the other hand, it may be quite affordable for some practices) • Difficult for organic farmers to operate with annual cash rent • Prevents farmer's access to conservation programs that require minimum five-year contracts
Long-term lease with rent tied to commodity prices	• Maximum or near-maximum $ each year to landowner • Security of multi-year land use for the farm operator; stands to benefit from practices that may take longer than one growing season to provide a return on investment. • Access to conservation programs that require long-term control of the land	• May not be affordable for ***some*** conservation or alternative crop practices (on the other hand, it may be quite affordable for some practices) • Less year-to-year flexibility for landowner
Long-term lease with rent	• Accounts for year-to-year	• More complicated to

tied to yield or total farm revenue	weather variations and possibility of resulting reduced yields and/or incomes • Landowner and farm operator share risk • Access to conservation programs that require long-term control of the land	administer; careful recordkeeping required • Not maximum $ each year to landowner • Less year-to-year flexibility for landowner
Crop sharing	• Accounts for year-to-year weather variations and possibility of resulting reduced yields and/or incomes • Landowner and farm operator share risk • Can facilitate sustainable and conservation practices through agreements on what to plant on which acres	• More complicated to administer; careful record-keeping required • Not maximum $ each year to landowner • May be affected by timing of crop sale
Graduated or stepped rent	• Can facilitate start-up for beginning farmers • Can facilitate the three-year organic conversion process • May be a tax credit for the landowner	• Requires up-front work to set the terms, plus careful yearly recordkeeping • Not maximum $ each year to the landowner
Rent-to-Own	• May qualify for Federal Beginning Farmers and Ranchers program dollars • Allows a beginning farmer to build equity	• May not return maximum $ each year to the landowner • Risk of default and loss of equity to the beginning farmer
Hybrid system: Use a combination of different options on different acres depending on crop yield potential and conservation practice potential.		

Further resources:

Sustainable Farm Lease. 2011. A Project of the Sustainable Agricultural Land Tenure Initiative. Drake University and Drake University Law School. www.sustainablefarmlease.org

Frequently Asked Questions about Sustainable Long-Term Farm Leases. 2012. Farmers Legal Action Group (FLAG) www.flaginc.org

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

Revocable and Irrevocable Trusts

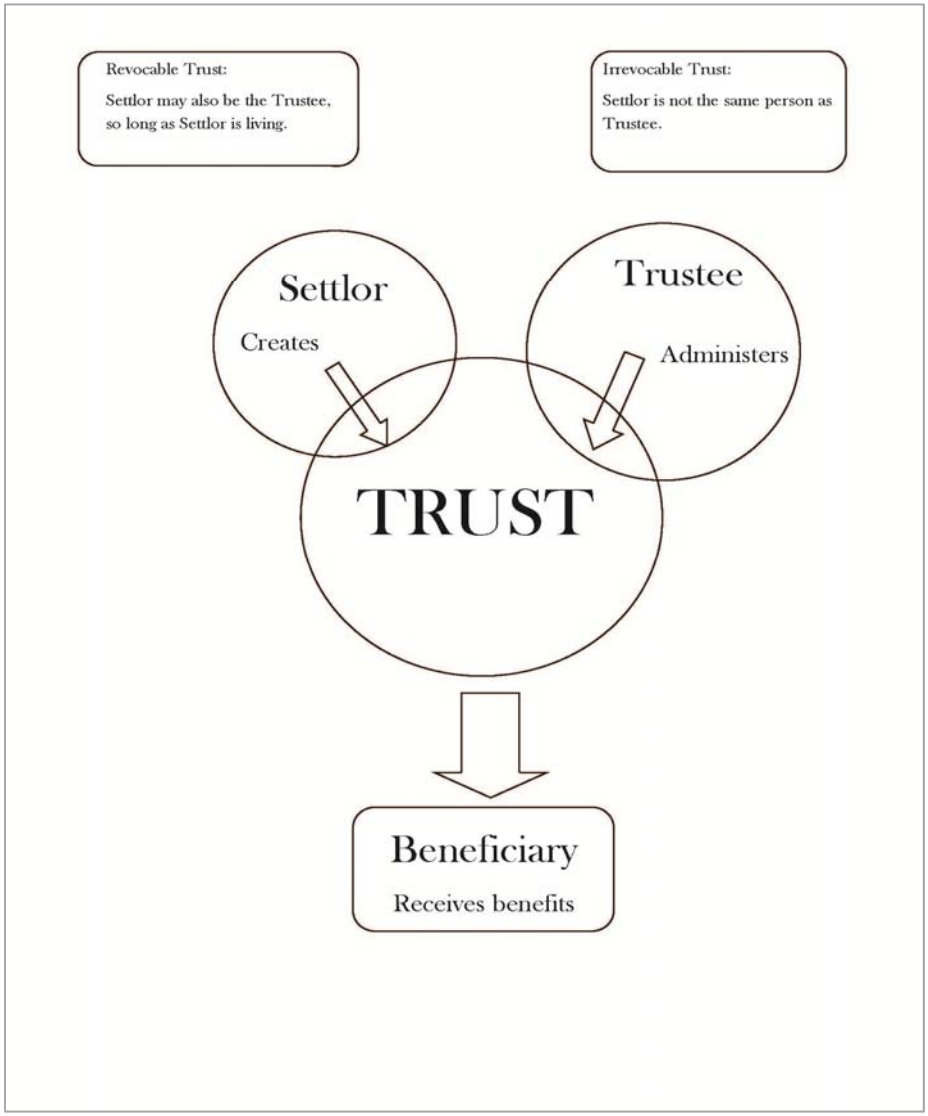
For landowners who want to keep the farm property in the family—whether or not a family member will farm it—putting the farm in *trust* offers a mechanism to encourage or require future operators to maintain conservation practices. Essentially, a trust establishes a legally binding management plan for a farm that will survive the settlor (the landowner who establishes the trust). As with an easement or a lease, the terms of a trust can include provisions requiring or encouraging conservation and sustainable agriculture practices. Moreover, a trust lends itself to the enforcement of a conservation ethic in the sense that good stewardship of the soil is essential for preserving the value of the estate for the beneficiaries.

Avoid Overly Restrictive Provisions in a Trust

What if a trust established in 1940 required that dairy cows on that farm would continue to be milked using the same procedures in place at the time that the trust was created? That era was pre-electricity for a lot of farms in this country. A provision like that would prevent future operators of that farm from being able to install a bulk tank and surge system and achieve Grade A status, and would thus virtually guarantee that dairy production would not continue at all on that farm – not at all the intent of the people who created the trust.

Two basic types of trusts can be established by a landowner during his or her lifetime – revocable and irrevocable. An *irrevocable trust* cannot be destroyed or altered, not even by the person who created it. A *revocable trust*, on the other hand, allows for the settlor to manage the trust, to receive benefits from it even though he or she no longer owns the property, and to change the terms of the trust or destroy it. However, after the settlor is no longer living, a revocable living trust becomes irrevocable, or permanent. In some states, a trust can be carried on from one generation to the next in perpetuity. Other states have a rule against perpetuities, requiring that a trust be dissolved 21 years after the death of the youngest generation alive when the trust is created.

A trust is governed by a designated trustee according to rules created by the settlor, on behalf of one or more designated beneficiaries (often the children or grandchildren), who share the benefit of rental income from the land. In a revocable trust, the settlor may also be the trustee as long as the settlor is living and competent. The settlor must designate someone else to become the trustee once the settlor is no longer able. This type of land transfer is a good way to distribute benefits to multiple heirs, while also guaranteeing access to the land for an operator willing to farm in a way that aligns with the goals of the trust. In fact, a specific operator could be named in the terms of the trust, and/or a long-term lease could be included as well. This arrangement can benefit the tenant operator by ensuring long-term access to the land while avoiding debt.



Finally, as with an easement, a note of caution should be observed when considering conservation provisions to include in the terms of a trust. Since a trust can last 100 years or longer, it's important to provide flexibility for the current operator at any given time to respond to societal or environmental changes not foreseen when the trust was created. The terms of a trust should be viewed as the vision for the land, stated in fairly general terms. The specific requirements for agricultural practices can be spelled out in shorter-term lease agreements, which can be re-negotiated from time to time.

Further resources:

Trusts as an Estate Planning Tool. 2012. Melissa O'Rourke and Kelvin Leibold**.** Ag Decision Maker. Iowa State University (ISU) Extension and Outreach. www.extension.iastate.edu/agdm/wholefarm/html/c4-59.html

Preparing to Transfer the Farm Business. 2013. Gary A. Hachfeld, David B. Bau, & C. Robert Holcomb. Transferring the Farm Series #1. University of Minnesota Extension. www.cffm.umn.edu/publications/pubs/farmmgttopics/transferringthefarmseries.pdf

Forming a Business Entity to Facilitate Farm Transfer

Formation of a business entity such as a *limited partnership* or *Limited Liability Company (LLC)* can be a useful tool for transferring a farm to the next generation. While transferring a farm owned as a sole proprietorship would entail a cumbersome re-titling of each asset to the next generation, a business partnership allows multiple business owners to own shares in the farm business, which can be sold, gifted, or passed through the estate from one owner to another. Furthermore, a limited partnership and an LLC allow for some owners to be managers, while others are simply members. This offers non-farm heirs the chance to own the farm business even though they are not managers.

Forming a business partnership allows family members to take ownership of the property and carry on many of the sustainable and conservation practices that the original owners had incorporated, even if they are not the farm operators of the land but instead the landlords. It is also a way for the subsequent generation (grandchildren) to still have the possibility of access to the land in the hopes of farming.

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

Further resources:

Farm Business Transfer Strategies. 2009. Gary A. Hachfeld, David B. Bau, C. Robert Holcomb, & James N. Kurtz. Transferring the Farm Series #2. University of Minnesota Extension. www.extension.umn.edu/distribution/businessmanagement/components/M1177-2.pdf

Using Partnerships & Corporations to Transfer Farm Assets. 2009. Gary A. Hachfeld, David B. Bau, C. Robert Holcomb, & James N. Kurtz. Transferring the Farm Series #3. University of Minnesota Extension. www.extension.umn.edu/distribution/businessmanagement/components/M1177-3.pdf

A Bequest: Frantzen Farm Example

Tom and Irene Frantzen are conservation-minded farmers in Iowa who are also long-time members of Practical Farmers of Iowa (PFI), a farmer-led nonprofit dedicated to on-farm research and education in sustainable agriculture practices. After careful consideration of a succession plan for their 300-acre farm, the Frantzens decided to bequeath the land to PFI. The bequest specifies that the farm should never be divided or sold and that Tom and Irene's son James should be the preferred tenant. The core vision is that the farm should always remain intact as a working farm with significant conservation features and that it should remain available as such for generation after generation of farmers, long after even their own son has retired from farming.

In light of steep appreciation of farmland values in the Midwest in recent years, this arrangement makes financial sense for the Frantzen family in several ways. For James, renting land from PFI is more affordable than buying out his two sisters' inheritances would be. It also provides assurance of long-term access to the land to make a living. As a bequest, this mechanism allows Tom and Irene to continue to own and earn income from the land throughout their retirement. Finally, Tom and Irene's non-farming daughters will receive their parents' life insurance proceeds. For all three children, the bequest allows them to avoid estate and inheritance tax on the land.

The Frantzens' situation may be unique because of their long and trusting relationship with PFI. However, landowners can use similar opportunities to donate or bequeath land to a state or local agency or a land-trust organization or conservancy.

More about the Frantzen story:
"**Family bequeaths farm to PFI**." March 5, 2013. Jean Caspers-Simmet. *Agri News*. www.agrinews.com/family/bequeaths/farm/to/pfi/story-5166.html (accessed 6/06/13).

Creating an Educational Farm

Some farm families or farmland owners have a strong desire to leave a legacy of education tied to their land. This takes a high level of commitment and significant endowment funds to ensure that the property can be operated as an educational endeavor, but it is by no means impossible for those with the resources and will to do it. Sometimes the endowment must come from the resources of the property owners. If the property is desirable to an institution or adds value to the mission of an existing nonprofit organization, the funds for operating the educational farm may come through that institution or organization. The following list includes examples of teaching farms that have been established through various methods. Many of the tools described elsewhere in this document can be applied to the goal of turning a farm into an educational resource.

Educational Farm Examples

This publication is offered as educational information. It does not offer legal advice. If you have questions on this information, contact an attorney.

1. Farm supported by endowment fund with connection to local school district:

   Henderson County Education Foundation, Inc.
   Johnson Farm Endowment Fund www.hcef.info/?p=517

   Excerpts from website:
   Established in 2007, the Johnson Farm Endowment Fund is used for maintaining and operating the farm, for ensuring the farm will operate in future generations, and to support educational projects and scholarships of interest to the late Leander and Vernon Johnson.

2. Farm donated to University with operating and program funds coming through a University-run endowment:

   Howling Cow Dairy Farm. North Carolina State University.
   www.ncsu.edu/foodscience/dairy/howlingcow/farm.html

   Excerpts from website:
   The farm evolved from the consolidation of four dairy units — the most recent being the Randleigh Farms, a gift from the Kenan family. The 389-acre operation supports a herd of 245 registered Holsteins and 55 registered Jerseys, an ideal mix to support dairy teaching, research and production.

3. Farm donated to University with some program funds coming from outside sources:

   Opportunities Farm. South Dakota State University.
   www.opportunitiesfarm.com/

   Excerpts from website:
   The Opportunities Farm is a gift received by the SDSU Foundation in the spring of 2001 [from benefactor LeRoy Poppens.] A grant from the state of South Dakota in 2003 and an investment by the SDSU Foundation enabled the Opportunities Farm to construct three types of feedlot systems. Valued at $1.6 million, the 1,120 acres of land and feedlot facilities provide an outstanding opportunity to conduct research and education for SDSU students.

4. Farm's original educational purpose restored through organization created by descendants of the founders:

   Shelburne Farms.
   www.shelburnefarms.org/about/history

Excerpts from website:
In 1886, Dr. William Seward and Lila Vanderbilt Webb began acquiring farmland on the shores of Lake Champlain to create a model agricultural estate. Subsequent generations struggled to find a workable future for this singular farm. Shelburne Farms began a rebirth in 1972, when family descendants founded a nonprofit organization of the same name, dedicated to conservation education.

5. Farm created by land purchase through a farmland preservation organization:

   White Oak Farm.
   www.whiteoakfarmcsa.org/about/

   Excerpts from website:
   In partnership with the Equity Trust, a national farmland preservation organization, White Oak Farm purchased 62 acres of farm and forest land in Williams, Oregon during the Fall of 2002. Our vision is to create a farm that is an ecologically sound and economically viable center dedicated to teaching, cultivating an ecological agriculture and distributing its bounty, and preserving and propagating a wide diversity of edible, medicinal, and wildlife plants.

6. Farm established through combination of protection from commercial development, purchase by city, and support by outside group:

   Zenger Farm: A Century-Old Working Urban Farm.
   http://zengerfarm.org/about-the-farm

   Excerpts from website:
   Ulrich Zenger Jr., with great fondness for the place that had been his home, had the foresight and determination to protect the land from commercial development and preserve its integrity as a farm. The land was purchased by the City of Portland's Bureau of Environmental Services (BES) in 1994, five years after his death. In 1995 the land was leased to Urban Bounty Farm, which formed partnerships with the Environmental Middle School and the Portland State University Capstone Program, among others, to broaden the farm's availability as an open-air classroom. In 1999, the Friends of Zenger Farm was assembled. They authored the Zenger Farm Master Plan, obtained the City's approval of the Conditional Use Master Plan, and partnered with BES to secure a 50-year lease of the property.

USDA Conservation Programs

The USDA has a variety of conservation programs that farmland owners can initiate on their land and later transfer through sale or lease to a new owner. This includes the Conservation Reserve Program (CRP), which provides rental payments to farmers for the number of acres of environmentally sensitive land they plant into a long-term (10 to15 years) cover to improve soil, prevent erosion and provide wildlife habitat. In fact, the Farm Service Agency (FSA) Transition Incentive Program actually encourages the transfer of conservation program land to a beginning farmer by allowing landowners to receive two additional years of CRP payments if they lease the land to a beginning farmer who grazes livestock and uses conservation practices.

Conservation Programs

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/
- Grasslands Reserve Program
  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/
- Farm and Ranch Lands Protection Program
  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/
- Conservation Stewardship Program
  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
- Transition Incentive Program
  www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=tipr

Conclusion

Considering that 65 years and older is the fastest-growing age bracket for American farmers, a lot of land is now changing hands. Huge numbers of landowners, whether the retiring farmers themselves or their heirs, are facing big decisions and many are asking how to promote sustainable agriculture through farmland transfer. Wielding the tools described above to promote conservation may be relatively new territory and may take persistence on the part of landowners. This overview is intended to offer a framework for discussing such options with a legal adviser, financial adviser, family members, agricultural educators, farmers and other landowners.

Further Resources on Farmland Transfer and Conservation

Minnesota and Midwest resources:

University of Minnesota Extension offers a 10-part online guide to farm business transfer called the Transferring the Farm Series.
www.extension.umn.edu/distribution/businessmanagement/M1177.html

Land Stewardship Project assists beginning farmers in developing viable business plans and connecting with established and retiring farmers to access land and mentorship opportunities.
http://landstewardshipproject.org/morefarmers

Renewing the Countryside offers a variety of information sources on farm succession (monthly radio program, bimonthly newsletter, downloadable publications, case studies), as well as individual assessment and coaching to landowners on the farm-transfer process.
www.farmtransitions.org

Farmers' Legal Action Group provides legal advice and guidance to farmers on estate planning and related matters.
www.flaginc.org

Beginning Farmer Center of Iowa State University offers guidance to farm families on farm succession planning and manages a LandLink matchmaking service to pair aspiring farmers in search of land with retiring farmers.
www.extension.iastate.edu/bfc/publications-and-webinars

Women Food and Agriculture Network's Women Caring for the Land Program provides guidance to women landowners throughout the Midwest to help them develop and implement their conservation goals.
www.wfan.org/our-programs/women-caring-for-the-landsm/

Farm Commons provides legal advice to farmers and landowners through one-on-one assistance, and also links farmers and farm attorneys with information on succession planning and other legal matters.
www.farmcommons.org

National resources:

Land Trust Alliance helps landowners identify strategies for conserving their land, including connecting with a local land trust.
www.landtrustalliance.org/conservation/landowners

American Farmland Trust conducts research, advocacy, and education related to farmland protection.
www.farmland.org

Land for Good serves farmers and landowners in New England on issues related to farmland access and succession planning, and offers a variety of online resources relevant nationwide.
www.landforgood.org/resources.html

Planning the Future of Your Farm: A Workbook Supporting Farm Transfer Decisions. 2012. Andrew Branan, attorney. Virginia Cooperative Extension.
http://pubs.ext.vt.edu/446/446-610/446-610.html

6 West Fifth Street Suite 650
Saint Paul, Minnesota 55102-1404

Phone: 651 223.5400
Fax: 651 223.5335

Internet:
lawyers@flaginc.org

Web site:
www.flaginc.org

Frequently Asked Questions on Contracts for Deed in Minnesota

Q: What is a contract for deed?

A: A contract for deed lets buyers purchase land without a mortgage loan. When a buyer and seller sign a contract for deed or contract for sale, the buyer agrees to pay the sale price to the seller in installments. Unlike when a loan with a mortgage agreement is used to purchase land, the seller retains the deed—the document that transfers title ownership—until the buyer has fulfilled the contract by making the final payment. Contracts for deed are chiefly used for sales between family members or private individuals.

Farmers use both contracts for deed and mortgage loans to buy farmland. However, when a lender is involved (such as a bank or a government agency), mortgage loans are usually used instead of contracts for deed.

Q: Is buying farmland with a contract for deed the same as buying farmland by getting a mortgage loan from the bank or the USDA Farm Service Agency (FSA)?

A: No. Contracts for deed are private agreements between two parties. For example, a beginning farmer (the buyer) and a transitioning farmer (the seller) could enter into a contract for deed agreement. Generally, there is no bank or government agency involved in a contract for deed. Instead, the buyer makes regular payments directly to the seller according to the contract.

One important feature of contracts for deed is that the **seller keeps legal title** to the land until the full contract for deed price is paid. Since most contracts for deed require regular payments over many years, **contract for deed buyers will not actually own the property until many years after signing the contract for deed**.

Unlike with contracts for deed, when a mortgage loan is involved **the buyer acquires legal title to the land immediately:** the buyer borrows money from a lender, such as a bank or FSA, and ownership of the land is transferred to the buyer when the loan proceeds are used to pay the seller.

Q: Why would a <u>beginning farmer</u> want to <u>buy</u> farmland via a contract for deed?

A: A contract for deed may be cheaper or more accessible for a beginning farmer. In fact, some beginning farmers may not qualify for a mortgage loan through a bank or FSA, making a contract for deed one of their only options for purchasing farmland.

Also, down payments and interest rates for contracts for deed may be lower than for mortgage loans because contracts for deed offer certain tax advantages for the seller (see below). In addition, contract for deed sellers don't charge the mortgage origination fees and application costs that lenders often charge.

Q: Why would a <u>transitioning farmer</u> want to <u>sell</u> farmland via a contract for deed?

A: From a financial perspective, contracts for deed offer potential tax advantages. Although the effect on any individual's taxes can vary greatly, many sellers can gain a significant tax advantage because the income from the land sale is spread out over time rather than coming in one lump sum (as it would when the sale is made using a mortgage loan).

From an altruistic and/or stewardship perspective, contracts for deed can offer transitioning farmers the opportunity to help a beginning farmer acquire farmland that the beginning farmer otherwise couldn't access due to lack of capital or poor credit. That beginning farmer might be a family member, a family friend, or simply someone who shares a transitioning farmer's views on land stewardship.

Additionally, contracts for deed can be simpler for transitioning farmer sellers. There would likely be no need for a realtor, no wait for mortgage approval, and possibly no need for a formal appraisal. On the flip side, however, contracts for deed create ongoing responsibilities for sellers (see below).

Q: What are some risks associated with contracts for deed?

A: For **buyers**, a major risk is the risk of **losing money already paid if a contract for deed is canceled**—for failure to make payments or for any other reason. If these payments had been in the form of mortgage payments to a lender, such as a bank or FSA, the value of these payments may be recoverable in the form of equity if the buyer is able to sell all or part of the property before a mortgage foreclosure occurs, or if the lender is able to sell the property for more than what is currently owed on the mortgage during a foreclosure sale. In a contract for deed scenario, on the other hand, cancellation could mean the buyer loses all of the money paid through the date of cancellation (almost as if the buyer had been making rent payments instead of contract for deed payments). This is a big risk, especially in a long-term situation where a contract for deed buyer could have been making

payments for 25 years on a 30-year contract for deed, and suddenly the buyer is left with no equity in the land after making payments for a quarter century.

Note that there are some potential legal avenues for recovering the value of contract for deed payments under Minnesota law, but these avenues are less straightforward than a mortgage situation and would almost certainly require a buyer to hire and pay an attorney. Note also that buyers can preserve their contract for deed rights after a default for failure to make payments as scheduled by bringing payments current within the time period provided by state law. Under Minnesota law, for contracts for deed executed after July 31, 1985, buyers have 60 days to eliminate the default and reinstate the contract.

A second risk for buyers is that a contract for deed can be canceled more quickly than a mortgage can be foreclosed. The buyer may only have 60 days from the notice of cancellation of a contract for deed to reinstate the contract and stop the cancellation.

In addition, contract for deed buyers are not covered by certain statutory protections provided to mortgage purchasers, such as a right of redemption. Under Minnesota law, a farmer would generally have either 6 or 12 months after a mortgage foreclosure sale to "redeem"—repurchase—the property by paying the foreclosure sale price, plus interest, and certain expenses. During this redemption period the farmer can continue to use the land. This right of redemption is not available to farmers whose contracts for deed are canceled. Additionally, the right of first refusal—which gives some farmers another chance to buy or rent their farm after it has been lost to a creditor—does not apply when a contract for deed is canceled by a private individual.

From a seller's perspective, contracts for deed can be risky because they require ongoing responsibilities. In contrast, mortgage-financed sales give sellers finality; the seller is usually completely finished with the sale transaction when the mortgage loan is made. If a mortgage buyer eventually has problems making payments, it is the lender—not the seller—who must take action. With a contract for deed, however, the seller is responsible for taking action if the buyer cannot pay or in some other way defaults on the contract. This could place a transitioning farmer in the difficult position of kicking a beginning farmer off the farm property, and could also result in lawsuits or other types of extended negotiations. Additionally, if a buyer defaults on a contract for deed, the seller would have to sell the property all over again.

Q: Should farmers buy or sell farmland using contracts for deed?

A: The answer is different for every farmer, depending on each farmer's ability to tolerate risk, obtain loans, and manage private agreements over time.

In all cases, though, it is smart for both transitioning and beginning farmers to obtain legal counsel prior to entering into a contract for deed arrangement. At the very least, an attorney can review a contract for deed and identify potential risks and

opportunities. This information can allow farmers to make informed decisions about whether a contract for deed is the right vehicle for buying or selling farmland.

6 West Fifth Street Suite 650
Saint Paul, Minnesota 55102-1404

Phone: 651 223.5400
Fax: 651 223.5335

Internet:
lawyers@flaginc.org

Web site:
www.flaginc.org

Frequently Asked Questions on Sustainable & Long-Term Leases in Minnesota

Q: Should my lease be in writing?

A: The answer is almost always yes. A written agreement can act as a roadmap for the landlord-tenant relationship, especially if a dispute arises. Also, real estate (land) leases for **more than one year must** be in writing. If a lease for over one year is not in writing, it will generally not be enforceable in court.

If your lease is for **exactly one year**, or **less than one year**, the law does not require it to be put in writing. A lease for less than one year can be orally agreed to between a landlord and tenant (often called a "handshake" agreement), as long as the landlord and tenant agree on basic terms (see below). However, if you end up in a dispute without a written lease, it is hard to prove what the terms are because it can become a "he said-she said" situation. Also, note that the term "year" refers to a calendar year of 12 months, not a crop year.

Finally, remember that if your lease is in writing, any verbal agreements that are not included in the written lease will not be enforceable.

Q: What should my lease look like?

A: Written leases do not have to be formal, but a lease should contain at least the following **basic terms** in order to be legally enforceable:

- Landlord and tenant names
- Description of the land to be rented
- Rent amount ($)
- Usually, signatures of both the landlord and tenant

An easy way to create a written lease is to send the landlord a letter confirming the terms of an oral agreement. In the letter, ask the landlord to respond within 10 days with any objections. Also, **any changes to a lease should also be put in writing**. Oral changes to a written lease are generally not enforceable in court.

Q: What are the benefits to the landlord of a long-term lease?

A: The benefits are many. They include:

- Reduced transaction costs, since the lease need not be renegotiated every year.
- Improved tenant security, which encourages tenants to make investments that will add value to the property.

Q: What are the disadvantages to the landlord of a long-term lease?

A: Disadvantages include:

- External factors, such as market prices or natural disasters, may cause the landlord to wish to change the terms of the initial agreement.
- It could lower the market value of the land if the landlord decides to sell the land, as the lease would be binding on new owners.
- The landlord may not want to be bound to a long-term relationship with a tenant he or she does not know.

Q: How long should a sustainable farm lease last?

A: It depends on the parties' needs and goals. Most leases run from year to year. However, a longer term lease (for example, three years or more) allows a tenant to invest in sustainable practices, which in turn can lead to increased soil health, higher crop yields, and added value to farmland. Also, tenant farmers new to a particular piece of land will often need a few seasons to determine how to coax the best yields from their unique location. Higher yields can translate into increased profit for both landlords and tenants via flexible rent provisions (see below).

Landlords and tenants can also use an automatic renewal clause to help encourage a long-term relationship. Finally, note that the Minnesota Constitution limits the length of farm leases to 21 years, so a lease for an indefinite period of time would likely not be enforceable in court.

Q: What are some types of leases to consider?

A: There are generally three types of leases: cash rent leases, crop-share leases, or flexible leases. Cash leases, where the tenant pays a fixed price for the rental of the land, are the most common, and typically are for only one season. Crop-share leases allow the landlord and the tenant to share in the risk and the benefits, with both contributing to input costs and both receiving a share of the crop. Flexible leases

provide landlords and tenants with some additional tools that can incorporate sustainability provisions.

Q: Are there leasing tools that can be used to incorporate rent flexibility and risk sharing to encourage longer-term leases and investment in sustainable practices?

A: Yes. There are many options, but here are some common types of lease provisions that can encourage longer leases by allowing the rent to change based on land values, crop yields, input prices, or other factors. Adding rent flexibility can help encourage a landlord to sign a longer-term lease by ensuring the landlord doesn't get locked into a lease that does not reflect the value of the property if land value, yields, or crop prices increase. Similarly, flexibility based on yield and revenue can make a tenant feel more comfortable about making a substantial financial commitment in a risky, weather-based, and market-dependent farm operation.

- **Flexibility options for cash leases:**
  - **Rent Adjustment Index.** This is typically used with cash leases, to encourage a long-term lease while addressing concerns about not being stuck with a fixed rent price when external factors that affect the rent change. The rent changes (annually or otherwise) based on agreed-upon factors (e.g., the consumer price index or a formula which could include commodity prices, land values, and input prices). It is important to agree in writing about what factors will be used to adjust the rent, as well as **how** (what market) and **when** (exact date) the prices or values will be calculated.
  - **Cost-Sharing Via Rent**: This could include "graduated rent," where rent rises each year as the tenant gets to know the land and increases soil health. Rent could also be reduced just for the first year or so, or it could be reduced to reward specific practices—such as organic certification or soil erosion practices.
- **Crop-Share Lease:** This is a traditional method of sharing risk. Rent is a specified share of the crop, which takes both farm yield and market price into account. **Input costs are usually shared as well.**
- **Flexible Leases:** These can be structured any number of ways, including a base rent plus a bonus, based on crop yields (county yield average, last year's yield, actual yield), crop prices, or farm revenue (a combination of yield and price). Again, it is important to agree in writing how these variables will affect the rent. Using farm revenue as the flexibility factor is probably the safest route for a tenant.

Each of these flexibility options can be individualized to fit a particular landlord-tenant relationship. As the details will matter immensely, it is best to have these types of flexibility provisions **in writing**.

Note also that basing rent on actual yield and/or entering into a crop-share lease can have an impact on USDA farm program payments because the landlord could be viewed as a part-operator. This could also cause the landlord to be viewed as self-employed, which has tax, estate planning, and Social Security payment implications. Be sure to consult with the USDA Farm Service Agency and an attorney before using those mechanisms to adjust rent.

Q: How can a lease encourage sustainable practices?

A: A landlord can agree to reimburse a tenant for the cost of improvements required for sustainable practices, could agree to share the cost of improvements, or could reimburse the tenant for any unused portion of the improvements at the end of a lease. Legally, the term "improvements" usually refers to permanent structures built on the land (such as a house, barn, or certain types of fencing) that generally become the landlord's property after the lease is over. Sharing the cost of improvements protects the tenant against losing the capital and effort invested after the lease ends. Landlords can also include a lease provision requiring approval prior to any construction.

Landlords can also agree to share the cost of implementing sustainable practices, which can make tenants more willing to try alternative methods. Additionally, provisions requiring periodic communication (letters, emails, phone calls) or tenant reporting (sending copies of new Organic Systems Plans, FSA reports) can help solidify a landlord-tenant relationship and assure the landlord that the land is being properly managed.

Q: Can a tenant enroll in conservation programs?

A: Generally yes, although the tenant's participation may be limited by the lease terms. For example, a tenant cannot enroll rented land in any program that imposes permanent easements, such as the Wetlands Preserve Program. But if a program requires participation for a certain number of years and the lease is for at least that long, generally a tenant can enroll the land in the conservation program—with the consent of the landlord.

Q: Can a landlord require a tenant to use sustainable practices?

A: Yes. For example, a conservation plan developed with the USDA Natural Resources Conservation Service (NRCS) could be incorporated into the lease, requiring both landlord and tenant to comply with the plan. Additionally, threshold and monitoring provisions could also be included in the lease to provide sustainability standards, such as acceptable levels of soil erosion. Provisions can also be included to address other concerns and practices, such as the removal (and ownership) of crop residue, conditions for manure spreading, and compliance with environmental laws and regulations. Tenants and landlords may also wish to include an agreed-upon statement of purpose stating that the purpose of the lease is to encourage good stewardship of the land.

From the tenant perspective, it may be wiser to agree to a lease that requires certain practices instead of specific results because circumstances beyond a tenant's control could make certain results (such as soil erosion levels) impossible to meet.

Some typical conservation provisions can be found at: http://sustainableaglandtenure.com/2010/10/key-considerations-for-a-sustainable-farm-lease-agreement/.

Q: What is a ground lease?

A: A ground lease is a long-term arrangement (typically more than 10 years) where a tenant owns "permanent improvements" on the farm property, such as a house, barn, or fencing—but rents the land. Sometimes a tenant might also own a small amount of land, such as the yard in front of a house. At the end of a ground lease, the improvements are sold back to the landlord leasing the land, or to the next tenant. This kind of lease allows a tenant to gain some equity, while not requiring a financial investment that a tenant cannot afford.

Q: What else should be considered when making a lease agreement?

A: It is impossible, in this short document, to include everything that landlords and tenants should think about, but other important items include:

- How to get out of the lease if circumstances make it difficult for either the landlord or tenant to continue with the lease arrangement.
- What happens if the landlord goes into bankruptcy. Generally, federal law allows tenants to remain on a bankrupt landowners' property until the end of a lease agreement, even if the land is sold. However, it is best to put this in writing in case a tenant is forced to assert his or her rights during a landlord bankruptcy.
- Whether there are any zoning or easement restrictions on the property.

- Whether it makes sense to invest in hiring a lawyer to draft or review a lease. Legal counsel is often a worthwhile investment for landlords and tenants entering a long, complicated, and potentially life-altering agreement.

The most important factor in a successful leasing relationship is clear communication of both the landlord's and the tenant's expectations.

Q: Do you have a standard form lease I can use?

A: Because each piece of land is different and the expectations of the landlord and tenant are different in each situation, there is no one-size-fits-all lease. It is critically important that you discuss your expectations before entering into a lease and incorporate those expectations into your lease. That said, there are some sample leases you can review for ideas at: http://sustainableaglandtenure.com/2010/06/form-leases/.

ADDITIONAL RESOURCES

See the Sustainable Farm Leasing Quick Reference Guide and www.sustainablefarmlease.org (a project of the Sustainable Agricultural Land Tenure Initiative) for more information and ideas on rent flexibility, risk sharing, and encouraging sustainable practices.

- **Sustainable Ag Land Tenure (SALT) Initiative**
  sustainablefarmlease.org, Sustainable Farm Lease Guide
- **Iowa State Extension Ag Decision Maker**
  Sample leases, extension.iastate.edu/agdm
- **Ag Lease 101 – North Central Farm Management Extension Committee: *http://www.aglease101.org/***
- **The Land Connection, thelandconnection.org**
  Guide for Land Seekers (resource list)
- **California Farm Link, californiafarmlink.org**
  A Farmers' Guide to Securing Land
- **Land For Good, landforgood.org (sample lease)**
- **Farmers' Legal Action Group, 651-223-5400**
- **Farm Transitions Toolkit.**
  landstewardshipproject.org/farmtransitionstoolkit

Valuing Sustainable Practices

By Jane Grimsbo Jewett, Minnesota Institute for Sustainable Agriculture
With contributions from Robert Maggiani, National Center for Appropriate Technology
September 2013

Introduction

You want to be a good steward of your land, and you want the people who come after you – family members or not – to practice good stewardship, too. What will it take to really make that kind of legacy happen? The following sections detail 10 common sustainable agriculture and conservation practices. We discuss some scientific background and reasons for the practices, estimated costs and benefits of each one, some of the barriers that new farmers may face in implementing them, and suggestions for rent, lease, or sale terms that can facilitate these practices. Each section includes a worksheet that allows you, a decision-maker for a piece of agricultural property, to calculate expected costs and benefits of the practice. This analysis will help you decide whether to take steps in your farm transition plan to ensure that the practice will happen on your land in the future.

It is important to recognize that the numbers presented in this publication are broad estimates that are calculated from national or regional averages over many farms. The numbers shown in the worksheets in each section are a starting point to illustrate possibilities, but they will not apply to every farm. You should collect as much information as you can about your own land and adjust the numbers to reflect your particular situation.

Contents

Crop Rotation

Crop rotation means changing the crop planted in a field from year to year. In the U.S. Midwest, it is common for grain growers to practice a two-year crop rotation by alternating between corn and soybeans in a given field each year.

In order to gain maximum benefits from crop rotation, you need a rotation sequence that is longer than two years. Multi-year rotations break up weed cycles as well as insect life cycles and certain disease cycles, reducing the damage these cause to crops. Including legumes in the rotation can create the conditions that lead to improved soil structure and fertility, which over the long term leads to increased crop yields with fewer purchased inputs. Growing a more diverse array of crops spreads out financial risk because a single crop failure will not be so disastrous (1). These benefits are seen by organic farmers who are required to use multi-year crop rotations, but the same benefits also happen on non-organic farms that use long crop rotations.

In spite of the fact that longer rotations can have net returns per acre as high or even higher than two-year rotations, the vast majority of agricultural acres in the Midwest are in a two-year rotation. Part of the reason is

2-year, 3-year, and 4-year crop rotations

Research at Iowa State University's Marsden Research Farm compared two-, three-, and four-year rotations: corn/soybeans (CS); corn/soybeans/oats (CSO); and corn/soybeans/oats+alfalfa/alfalfa (CSOA).

Fossil fuel use in diesel fuel equivalents:

- Two-year CS: 25 gallons/acre
- Three-year CSO: 10 gallons/acre
- Four-year CSOA: 11 gallons/acre

Corn yield comparison:

- Two-year CS: 194 bushels/acre
- Three-year CSO: 199 bushels/acre
- Four-year CSOA: 202 bushels/acre

Soybean yield comparison:

- Two-year CS: 50 bushels/acre
- Three-year CSO: 55 bushels/acre
- Four-year CSOA: 57 bushels/acre

Profitability, as % of net return to management for the two-year CS system:

- Two-year CS: 100%
- Three-year CSO: 103%
- Four-year CSOA: 91%

Reference:

Energy and Economic Returns by Crop Rotation. September 2012. Ann M. Johanns, Craig Chase, and Matt Liebmann. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-90.html (accessed 8/12/13).

that in two-year rotations, fossil fuel inputs substitute for the higher labor inputs required for the three- and four-year rotations (2). Lots of farmers choose the two-year rotation and accept the relatively small reduction in net return per acre in order to operate many more acres with less labor.

How can a landowner make it possible for the future land owners or operators to use a three- or four-year crop rotation? Beyond the higher labor requirement, there are costs in the form of background management and machinery ownership to deal with a complex multi-crop system *(see Complexity Costs text box)*. Retiring farmers or landowners could consider giving the future farm operator a credit for all or part of the higher management costs he or she will have from using a long rotation. The choice to include a longer rotation partly comes down to the determination of the landowner and farm operator. Long rotations that reduce fertilizer and pesticide expenses are an easier decision to make in years when grain prices are low. It takes a stronger commitment to stick to it in years when grain prices are high, when it's really tempting to let go of the long rotation in favor of a large profit from planting all acres to corn *(see Corn & Soybean Profitability text box)*.

If the future operator will not own the land, you should consider a long-term lease arrangement to ensure that the farm operator can maintain a three- to four-year crop rotation system. You can specify

Complexity Costs

Calculations of costs of operating an organic farming system show an estimated $117/acre higher cost for background management + dealing with system complexity + machinery ownership + other factors, as compared to a conventional corn and soybean system *(see Organic Costs text box in the Organic Certification section)*. We'll call this total cost the "complexity" cost.

Some of that complexity cost has to do with management time and labor spent in dealing with organic certification requirements, but a portion of the complexity cost has to do with managing a larger variety of crops and owning or hiring the different types of machinery to deal with those crops (Delbridge et al.). Those costs for crop rotation management and machinery ownership would also apply to a conventional farm with a rotation longer than two years.

If we estimate that 50% of the total complexity cost for an organic system would apply to a non-organic four-year rotation:

$117/acre total complexity cost /2 = $58.50/acre in complexity cost for non-organic four-year rotation.

(Round to $59/acre)

Reference:

A whole-farm profitability analysis of organic and conventional cropping. 2013. Timothy A. Delbridge, Carmen Fernholz, Robert P. King, William Lazarus. *Agricultural Systems*. http://dx.doi.org/10.1016/j.agsy.2013.07.007

multi-year rotations in the terms of a lease. Use land rental rates that are in line with typical rates in your area, that reflect the crop production potential of your soil, and that give the farmer sufficient profit potential so that she or he will be able to stick to the longer rotation in good years and bad years. Your local NRCS office can help you find those appropriate rates. If the future operator will also be the owner, you can use deed restrictions or covenants to ensure that the land will be treated the way you want. See Conservation Financing for more details about these tools for farm transitions.

Crop Rotation			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Lowers risk of disease, insect, and weed problems Improves soil structure and fertility Increases species diversity Spreads out workload Spreads out financial risk Reduces purchased synthetic fertilizer inputs **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Cost of dealing with the complexity of a long crop rotation system: $59/acre *(See Complexity Cost text box in this section)*	$6/acre/year average greater net return for 3-year rotation than for 2-year rotation (1) Plow-down value of alfalfa in providing nitrogen to the next cash crop: $96/acre of alfalfa that will be followed by corn *(See Alfalfa Nitrogen Credit text box in Perennial Forage section)* Plow-down value of alfalfa in providing nitrogen to the second-year cash crop: $30/acre of corn or small grain in second year following alfalfa *(See Alfalfa Nitrogen Credit text box in Perennial Forage section)* $8.60/acre/year gain in fertilizer value of soil by saving 4.1 tons/acre/year from soil erosion; cumulative over years *(See Value of Saving Soil text box in this section)* Benefit to society: approximately $20/acre/year gain in water quality value of soil by saving 4.1 tons/acre/year of soil from erosion *(See Value of Saving Soil text box in this section)*	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **Rotation.** In *Organic Risk Management: Tools for Managing Pest and Environmental Risks to Organic Crops in the Upper Midwest*. 2010. Editors: Kristine M. Moncada and Craig C. Sheaffer. www.organicriskmanagement.umn.edu/ (accessed 8/27/13)

(2) **Energy and Economic Returns by Crop Rotation.** September 2012. Ann M. Johanns, Craig Chase, and Matt Liebmann. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-90.html (accessed 8/12/13).

Further Resources:

Ag Decision Maker, Whole Farm Decision Tools. Iowa State University Extension and Outreach. 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.

Value of Saving Soil

Soil lost due to erosion in the Corn Belt of the U.S. Midwest (2007 average numbers):

Water erosion = 3.9 tons/acre/year (1)
Wind erosion = 0.2 tons/acre/year (2)
Total erosion = 4.1 tons/acre/year

The loss rate on your land may be lower or higher, depending on how steep the slopes of the fields are, the cropping system, soil type, and various other factors. To find out the expected rate of soil erosion on your land, contact your local Natural Resources Conservation Service (NRCS) office to ask them for an estimate. Find your local NRCS office: http://offices.sc.egov.usda.gov/locator/app?agency=nrcs

Plant nutrient value of saving soil:

The value of the plant nutrients nitrogen (N), phosphorus (P), and potassium (K) provided by one ton of soil is equal to about $2.10 of purchased fertilizers, in 2012 dollars (3).

If good soil conservation practices are followed:
4.1 tons/acre/year of soil saved x $2.10/ton = about $8.60/acre/year in plant nutrients.

A couple of things to note:
- This is a cumulative savings over years because those tons of soil provide those nutrients *every* year. As minerals and organic matter in the soil gradually break down, the nutrients contained in them become available to plants.
- This calculation only accounts for major nutrients: nitrogen, phosphorus, and potassium. Soil also provides minor, but important, nutrients like sulfur, magnesium, calcium, boron, and others.

Water quality improvement value of saving soil:

The Natural Resources Conservation Service estimates that compliance with conservation standards results in $4.96 in off-farm water quality benefits for every ton of soil saved, in 2007 dollars (4).

continued on next page …

Value of Saving Soil, continued: (pg. 2)

If good soil conservation practices are followed:
$4.96/ton in benefits x 4.1 tons/acre/year saved = $20.34/acre/year in water quality benefits (Round to $20/acre/year)

References

(1) **Water Erosion on Cropland, by Region and Year.** NRCS. In *2007 National Resources Inventory, Soil Erosion.* www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/nra/nri/?cid=nrcs143_013656

(2) **Wind Erosion on Cropland, by Region and Year.** NRCS. In *2007 National Resources Inventory, Soil Erosion.* www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/nra/nri/?cid=nrcs143_013655

(3) **Value of Soil Erosion to the Land Owner.** August, 2012. Mike Duffy, Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-75.html (accessed 6/11/13)

(4) **Interim Final Benefit-Cost Analysis for the Environmental Quality Incentives Program (EQIP)**. January 2009. USDA Natural Resources Conservation Service. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_007977.pdf

Corn & Soybean Profitability

When making decisions about future land use, it's important to get the full picture of what the costs and the benefits of those decisions will be. One important number to estimate is the potential loss of net income per acre from a cash grain crop if something other than cash grain will be grown.

There are many tools available to help estimate what cash crop values might be. Grain prices change over time, so you can't know future prices for sure; but you can use past averages to make your estimate. Because corn, soybean, and other grains are handled as commodities in the stock market, the prices of these tend to be similar all over the country at any given time. Production costs and typical yields change a lot from place to place, though, so profitability is not the same all over. The Economic Research Service (ERS), part of the USDA, is a good source of average data on costs of production and profits from crops (1,2).

If you want a quick and easy estimate of profit per acre from a grain crop, open the ERS report for your crop (1); find the column for your region of the country (2); and use the "Value of production less total costs listed" number. That's the average amount of profit per acre from that crop after production costs, labor, and farm overhead costs are subtracted from the total value of the grain. You should look at more than one year, because crop yields and prices can change greatly from year to year.

- ERS estimated 2011 profit from Heartland CORN: $247.50/acre/year
- ERS estimated 2012 profit from Heartland CORN: $146.87/acre/year
- Average of 2011 and 2012 CORN: $197.20/acre/year

- ERS estimated 2011 profit from Heartland SOYBEAN: $206.12/acre/year
- ERS estimated 2012 profit from Heartland SOYBEAN: $216.75/acre/year
- Average of 2011 and 2012 SOYBEAN: $211.44 /acre/year

You can calculate a specific estimate of crop prices, production costs, and profits for your own land. A retiring farmer will most likely know what current grain prices are, the long-term average yields for any field, and may have a fairly good estimate of production costs per acre. If those numbers are not known, though, here are some places to look up average numbers:

continued on next page ….

Corn & Soybean Profitability, continued (pg 2)

Yields:

National Agricultural Statistics Service, Statisics by State: www.nass.usda.gov/Statistics_by_State/ (3)

Click on your state. On your state's page, click on "County Estimates." Then choose a crop report. You will get a table of information on that crop's acreage and yield by county.

It can be easy to get lost in the NASS web site, though. If you have trouble, contact your local Natural Resources Conservation Service (NRCS) office to ask about average crop yields for your county. Find your local NRCS office: http://offices.sc.egov.usda.gov/locator/app?agency=nrcs

Grain Prices:

The Department of Agricultural and Applied Economics at the University of Wisconsin-Madison has a nice, accessible web page that lets you find prices for a variety of crop and livestock products, by month and by year (4). You may want to use an average of several years, since prices change a lot from year-to-year.

Production costs:

Use the "Total Costs Listed" number for the crop from the same ERS tables mentioned above (1).

Example Corn & Soybean Profit Calculations:

Note: The following corn and soybean calculation examples use 2011 numbers for Chickasaw County, Iowa (3). The grain prices in 2011 were significantly higher than the average prices of the previous 5 years, and yields were good in 2011, so profits from corn were very high. You would not expect to see this same level of profit every year, but it's an example of why farmers can be very tempted to break away from a longer rotation in favor of growing corn.

continued on next page …

Corn & Soybean Profitability, continued (pg 3)

Example of profit per acre calculation for corn:

- 2011 corn yield: 188.8 bushels/acre (3)
- December 2011 corn price: $5.86 / bushel (4)
- Production Costs in 2011 for Heartland corn: $636.39 /acre (1)
- Calculate: (Yield x Price) – Production Cost = Profit
- 188.8 bu./ac. X $5.86/bu. = $1,106.87 /acre gross income
- $1,106.87/ac. Income - $636.39/ac. Production Cost = $469.98/acre profit

Example of profit per acre calculation for soybean:

- 2011 soybean yield: 51.4 bushels/acre (3)
- December 2011 soybean price: $11.50 / bushel (4)
- Production costs in 2011 for Heartland soybeans: $409.81 / acre (1)
- Calculate: (Yield x Price) – Production Cost = Profit
- 51.4 bu./ac. X $11.50/bu. = $591.10/acre gross income
- $591.10/ac. Income - $409.81/acre Production Cost = $181.29/acre profit

Again, remember, this example reflects 2011 yields and prices which were both high. This level of profit will not be seen every year.

Throughout the remainder of this publication we'll be using corn and soybean profit per acre figures from the University of Minnesota (5). These figures include government payments for corn and soybean production and are averages for the years 2008-2012:

- CORN profit = $310.47/acre/year
- SOYBEAN profit = $149.70/acre/year
- Average profit = $230.09 (Rounded to $230/acre/year)

continued on next page …

Corn & Soybean Profitability, continued (pg 4)

References

(1) **Commodity Costs and Returns**. June 2013. USDA Economic Research Service. www.ers.usda.gov/data-products/commodity-costs-and-returns.aspx#.UfvbrY3U98E (accessed 8/30/13).

(2) **Agricultural Resource Management Survey (ARMS): Resource Regions**. September 2010. USDA Economic Research Service. http://webarchives.cdlib.org/sw1wp9v27r/http://ers.usda.gov/briefing/arms/resourceregions/resourceregions.htm (accessed 8/30/13).

(3) **Statisics by State**. USDA National Agricultural Statistics Service (NASS). www.nass.usda.gov/Statistics_by_State/. (accessed 8/30/13).

(4) **Prices of Grains, Livestock Products, and Hay**. Brian Gould. In Understanding Dairy Markets: Your Source for Market Information and Price Risk Management Principles. University of Wisconsin, Madison – Department of Agricultural and Applied Economics. http://future.aae.wisc.edu/tab/feed.html#65 (accessed 8/30/13).

(5) **What does it take to earn a living on the farm?** April, 2013. Gary Hachfeld, University of Minnesota Extension. http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_440374.pdf (accessed 8/06/13)

Soil Fertility Management

Adding livestock manure, either from animals on the farm or purchased nearby, is a common practice on fields in the Midwest. Eventually, that organic material breaks down and becomes stable soil organic matter (SOM). Good SOM levels allow less use of purchased fertilizer and other purchased soil amendments. Good SOM levels also help drought-proof the soil. SOM is like a sponge: it absorbs up to six times its weight in water (1). Increasing SOM helps the soil retain and hold water that can be used by crops.

It does make a difference whether manure or synthetic fertilizers are used to manage soil fertility. According to the Leopold Center for Sustainable Agriculture at Iowa State University, "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 (2)." Synthetic fertilizers are produced using fossil

Your Living Soil

Healthy soil includes:

Minerals – bits of sand (coarse), silt (finer), and clay (finest)

Organic matter – carbon-based materials that come from the breakdown of plant, animal, and microbial matter.

Humus – Organic matter that has been thoroughly broken down and changed by passing through microbes or by chemical reactions in the soil. Humus is how soils store carbon.

Roots – The healthiest soils are those that have living plants on them all the time. (Including winter! Dormant plants are still alive!) Living roots wind through spaces between soil particles and larger soil clumps called "aggregates," and help bind those clumps together.

Living organisms – Healthy soil is home to an entire unseen network of:

- Bacteria
- Fungi
- Protozoa (microscopic animals)
- Earthworms and other worms called nematodes
- Arthropods: millipedes, mites, beetles, spiders, ants

The sheer number of organisms in soil is hard to imagine: healthy soil contains 100 million to 1 billion bacteria per teaspoon. The living things in the soil feed on dead plant and animal material, living plant roots, and each other. In the process, they release nutrients that can be taken up by plants.

Reference:

Soil Biology Primer **[online].** Available: http://soils.usda.gov/sqi/concepts/soil_biology/biology.html (accessed 5/21/13)

fuels, so if reducing fossil fuel use is an important part of the vision for the future of your farm, then encouraging use of manure for fertility is an important option to consider. Manure produced by large confined animal feeding operations (CAFOs) and by small farms can become a problem and a pollutant unless it is spread on land as a fertilizer, using good management techniques. Encouraging use of manure as fertilizer is a way to turn a potential pollution problem into a good resource for crop production.

Manure application is something that many cash grain farmers choose not to do because it takes different equipment and requires more labor and management than use of purchased synthetic fertilizer. Synthetic fertilizer has specific, known amounts of each nutrient in it. Manure is more variable, so farmers who use it need to get it tested to learn the nutrient levels and then make calculations of the amount of manure needed. Sometimes synthetic fertilizer may be needed in addition to the manure, to balance the levels of each nutrient needed by the crop that will be grown. That means the farmer may need to run two different sets of equipment across the fields, to apply the manure and the synthetic fertilizer.

Nutrients in Manure

The example manure application rate shown in this table is based on liquid swine manure. Manure used on your land might be a different type (solid instead of liquid), or from a different livestock species. Those things will change the calculations of how much manure should be used and the cost of application. See the references listed below to find information that matches the type of manure your farm will use.

In our example:

- The manure used is liquid manure from finishing swine, which has an estimated average nitrogen content of 58 lbs. per 1,000 gallons of manure (1).
- Corn nitrogen needs per acre range from 130 lbs. to 180 lbs.; we kept to the low side of that at around 140 lbs. of nitrogen per acre (1).
- 80% of the nitrogen applied in liquid swine manure is available to the crop in the first year that the manure is applied, if sweep injection technique is used for manure application(1).

continued on next page ...

Nutrients in Manure, continued (pg. 2)

The calculations:

- 3,000 gallons of manure x 58 lbs./1,000 gallons = 174 lbs. of nitrogen applied in manure.
- 80% availability, so 174 x 0.8 = 139.2 lbs. of nitrogen/acre available to corn crop.
- Cost of application: liquid injection method at $11.90/acre(2), so cost for 3,000 gallons/acre = $35.70/acre.

Value of nutrients in liquid manure from finishing swine, per 1,000 gallons of manure; in 2012 dollars.			
	Nitrogen	Phosphate (phosphorus)	Potash (potassium)
$/lb. of commercial fertilizer (3)	$0.60	$0.72	$0.54
Lbs. of nutrient/1,000 gallons of manure (1)	58	44	40
$ value/1,000 gallons of manure	$34.80	$31.68	$21.60
Total value of 1,000 gallons of manure to supply nitrogen, phosphorus, and potassium to a crop: $34.80 + $31.68 + $21.60 = $88.08			

References:

(1) **Manure Management in Minnesota.** 2012. Jose Hernandez and Michael Schmitt. University of Minnesota Extension publication # 03553. www.extension.umn.edu/distribution/cropsystems/DC3553.html.

(2) **2013 Iowa Farm Custom Rate Survey**. March 2013. William Edwards, Ann Johanns, and Andy Chamra. In *Ag Decision Maker*, Iowa State University Extension and Outreach. www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf

(3) **Fertilizer Use and Price**. Reports from the Economic Research Service, USDA. www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx#26727. (accessed 6/11/13)

How can a landowner make it possible for future landowners or operators to use manure for fertilizer? Using manure is generally cheaper overall than using synthetic fertilizer, so manure use is not likely to be a financial burden for the farmer. In a few cases, the distance to a source of manure may raise transportation costs to the point that its use is not feasible. The main drawback to manure is the time and management effort that the farm operator needs to invest in it. Synthetic fertilizer doesn't take as much time and management.

As with crop rotation, the choice to use manure depends partly on the determination of the landowner and the farm operator to use it. Both farm operator and landowner need to understand the benefits of manure use and agree to use it on the farm. The landowner may consider giving the farm operator a credit for the manure management efforts that contribute to long-term soil health. Specifying manure use can be accomplished through lease terms, and can be done with either an annual cash rental situation or a longer-term lease. See Conservation Financing for more details about lease terms.

Manure Management & Application			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Encourages soil biological activity Provides a useful purpose for livestock manure, which could otherwise become a pollutant Raises soil organic matter levels and increases water-holding capacity of soil Avoids purchase of commercial fertilizers that are produced using fossil fuels **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Application cost for liquid swine manure, about $36/acre *(See Nutrients in Manure text box)*; possibly higher if long haul distance. Manure testing, $27 for basic nitrogen, phosphorus, & potassium test; 1 or 2 tests/season (3) . Management time to collect and send in samples, calculate crop nutrient needs and manure quantities required: estimate at $20/hour and half an hour per field. Cost of manure purchase: frequently zero; cost is in getting it hauled and spread. Odor; personal value judgment on how offensive the manure odor is when it's being pumped and applied.	$15.70/acre/year of nitrogen, phosphorus, potassium, and sulfur for each 1% of soil organic matter; it takes about a decade of regular manure application to raise the SOM by 1%. (*See Value of Soil Organic Matter textbox)* $88.08 approximate value of the nitrogen, phosphorus, and potassium in 1000 gallons of manure *(See Nutrients in Manure text box)*. This is an avoided cost: you don't buy this amount of commercial fertilizer because you have the nutrients in the manure.	Costs avoided: + Costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **Organic Matter Management**. In The Soil Management Series. Revised 2008. Ann Lewandowski.
www.extension.umn.edu/distribution/cropsystems/components/7402_02.html (accessed 6/11/13).

(2) **Frequently Asked Questions about Cropping System Diversity and Profitability.** [online] Leopold Center for Sustainable Agriculture, Iowa State University. www.leopold.iastate.edu/faq-cropping-system-diversity-profitability. Accessed 6/10/13.

(3) **Dairyland Laboratories Manure Packaging & Pricing.**
https://www.dairylandlabs.net/pages/m_packaging_pricing.php

Further Resources:

Soil Health, Profits & Resiliency. This Land Stewardship Project web page features ways Midwestern farmers are building soil organic matter and other biological attributes of their soils using cover crop cocktails, managed rotational grazing, perennial plant systems and no-till agriculture.
www.landstewardshipproject.org/stewardshipfood/soilquality

Sustainable Soil Management. 2004. Preston Sullivan. Appropriate Technology Transfer for Rural Areas (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. 2002. Preston Sullivan. Appropriate Technology Transfer for Rural Areas (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. 2010. John Lamb, Sheri Huerd, and Kristine Moncada. In *Organic Risk Management*, Editors Kristine Moncada and Craig Sheaffer. University of Minnesota.
www.organicriskmanagement.umn.edu/soil_health.pdf (accessed 8/30/13)
This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest, but it includes a lot of good basic agronomy and soil science information that is useful for non-organic farmers as well.

Soil Fertility. 2010. John Lamb, Kristine Moncada, and Craig Sheaffer. In Organic Risk Management, Editors Kristine Moncada and Craig Sheaffer. University of Minnesota. www.organicriskmanagement.umn.edu/soil_fertility.pdf (accessed 8/30/13)
This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest, but it includes a lot of good basic agronomy and soil science information that is useful for non-organic farmers as well.

The Cost of Soil Erosion. January 2013. Iowa Learning Farms, Iowa State University Extension and Outreach.
www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Cost_of_Eroded_Soil.pdf (accessed 8/30/13).
Erosion costs the landowner because of lost farmland productivity and potentially decreased land sales price. This study is reported by the Iowa Learning Farms, which is a joint project of many of the agricultural organizations in Iowa; including Iowa State University, the Leopold Center for Sustainable Agriculture, and the Iowa Department of Agriculture and Land Stewardship.

Value of Soil Organic Matter

Increasing the Soil Organic Matter (SOM) in a typical acre by 1% can increase that acre's worth due to the nutrients stored in that organic matter. Soil organic matter releases nitrogen, phosphorus, potassium, sulfur, and carbon as it gradually breaks down, so every year, every 1% of SOM is a source of approximately $15-worth of nutrients that are available to plants.

It does take time to increase SOM. It takes about 10 pounds of added organic material to eventually break down and become one pound of soil organic matter. You would need 200,000 pounds of manure per acre, applied at smaller annual rates over a period of at least 10 years, to raise the SOM level of a typical soil by 1%.

This increase in SOM could happen faster if the crop residues were incorporated back into the soil, but even then, it would require a number of years. Building SOM depends on the living creatures in the soil, and it is a gradual process. You can't force it to happen faster by adding excessive manure at one time -- that just puts all of the nutrient levels out of balance and kills off the life in the soil that is needed to break down the manure. Over-application of manure could also be a pollution hazard.

Calculating the value of SOM:

Soil organic matter decomposes and releases nutrients at different rates depending on the texture of the soil, temperature, moisture, tillage, and other factors. Using an estimate from Minnesota of 3% SOM in the soil and a 2% annual decomposition rate (1), along with SOM nutrient level estimates from The Ohio State University Extension (2), the following table shows nutrients contained in the SOM and nutrients that become available to plants each year from the SOM.

Nutrient	Total amount per acre contained in 3% SOM*	Total amount available per acre per year with 2% annual decomposition of SOM
Nitrogen (N)	3,000 lbs.	60 lbs.
Phosphorus (P)	300 lbs.	6 lbs.
Potassium (K)	300 lbs.	6 lbs.
Sulfur (S)	300 lbs.	6 lbs.

*An acre of soil, 6 inches deep, weighs an average of 2,000,000 lbs. At 3%, the total SOM would be 60,000 lbs. This is assumed to be 50% carbon, and SOM typically has a 10:1 ratio of carbon to nitrogen, so nitrogen would be 5% of the total SOM. (1,2)

Value of Soil Organic Matter -- continued (pg 2)

Using fertilizer prices from 2012 (3,4), the SOM-supplied nutrients would have the following value per acre per year:

Nutrient	Lbs. supplied by SOM, per acre per year	Value/lb. in 2012 dollars (3,4)	Total value from SOM per acre per year
Nitrogen (N)	60	$0.60 (applied as urea)	$36
Phosphorus (P)	6	$0.72	$4.32
Potassium (K)	6	$0.54	$3.24
Sulfur (S)	6	$0.59	$3.54
TOTAL value of plant nutrients from 3% SOM, per acre per year:			$47.10

The SOM releases approximately these levels of nutrients every year, so over a 10-year period the value of 3% SOM is about $470 per acre.

Increasing SOM percentage in the soil will increase the amount of nutrients available from SOM. Based on the numbers in the tables above, a 1% increase in SOM would deliver:

$47.10/acre/year for 3% SOM, divided by 3 = $15.70/acre/year for each 1% SOM

References:

(1) **Organic Matter Management**. In *The Soil Management Series*. Revised 2008. Ann Lewandowski. www.extension.umn.edu/distribution/cropsystems/components/7402_02.html (accessed 6/11/13).

(2) **Understanding Soil Microbes and Nutrient Recycling**. 2010. James J. Hoover and Rafiq Islam. The Ohio State University Extension. www.northcentralsare.org/Educational-Resources/Project-Products/Understanding-Soil-Microbes-and-Nutrient-Recycling (accessed 6/11/13)

(3) **Fertilizer Use and Price**. Reports from the Economic Research Service, USDA. www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx#26727. (accessed 6/11/13)

(4) **2012 Sulfur Fertilizer Price Comparison for Alfalfa**. April 2012. Carrie Labowski, University of Wisconsin. http://ipcm.wisc.edu/blog/2012/04/2012-sulfur-fertilizer-price-comparison-for-alfalfa/. (accessed 6/11/13)

Cover Crops

Ninety percent of grain growers use crop rotations (most of those are two-year rotations), but fewer than 7% use cover crops in their rotations and only about 1% of all cropland acres were in cover crops in 2010 (1). Most cover crops planted by Midwestern farmers are not harvested and sold. Rather, they are planted and then chopped, mowed, or plowed down.

Cover crops help build soil organic matter by scavenging nitrogen and other nutrients left in the soil and using it for growth, tying it up in the plant material of the growing cover crop. Once the cover crop is chopped, mowed, plowed, etc.; the billions of bacteria and fungi that live in the soil break down that plant material gradually. Cover cropping has multiple benefits on the farm and off the farm, many of which are difficult to represent in dollars. Cover crops keep living roots in the ground when there is no cash crop growing, which keeps soil anchored in place and reduces soil erosion. This in turn contributes to improved water quality. Cover crops help to break weed, pest and

Cover Crop Nitrogen

The amount of nitrogen available to the next crop from a plowed-down cover crop depends on timing of plow-down, type of cover crop, amount of ground cover and maturity of the cover crop, weather and soil conditions while the plowed-down crop is breaking down, and other factors.

This example is based on a hairy vetch cover crop that produces 60 lbs./acre of nitrogen (1).

- Assuming that the hairy vetch is plowed down and incorporated into the soil, about half of that nitrogen becomes available to the following corn crop (2).
- 60 lbs/acre / 2 = 30 lbs./acre
- Based on 2012 fertilizer prices, the value of that nitrogen is:
  30 lbs./acre x $0.60/lb (3) = $18/acre

References:

(1) **Winter Cover Crops.** 2010. Kristine Moncada and Craig Sheaffer. In *Organic Risk Management.* Eds. Kristine Moncada and Craig Sheaffer. University of Minnesota. www.organicriskmanagement.umn.edu/winter_cover13.html (accessed 9/03/13).

(2) **Managing Cover Crops Profitably.** 2007. Sustainable Agriculture Research and Education (SARE), USDA. www.northcentralsare.org/Educational-Resources/Books/Managing-Cover-Crops-Profitably-3rd-Edition (accessed 9/03/13).

(3) **Fertilizer Use and Price**. Reports from the Economic Research Service, USDA. www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx#26727. (accessed 6/11/13)

disease cycles, which results in lower crop damage and avoided costs from lower use of herbicides and pesticides. Cover crops, especially legumes, can contribute nitrogen to the next cash crop, reducing the need for purchased fertilizer (2,3). Each one of these effects may be fairly subtle and might not be seen every year; depending on weather conditions, the cover crop used, and how the cover crop is managed. Overall, especially over time, the impact of consistent cover cropping on the whole farm's system can be very positive (3).

An interesting feature of cover crops is that they are frequently aerial-seeded into a standing crop. "Flying" the seed onto the field with a small plane avoids any damage to the cash crop caused by running seeding equipment on the ground. Cover crop seeding is often done in the middle of the growing season, once the crops are already beginning to mature. As the cash crop matures, it drops leaves or leaves dry up, letting more light through the crop canopy to allow the cover crop to grow (4). The cover crop is then established at the time of cash crop harvest and may continue to grow after harvest, depending on weather conditions. Besides use with corn and soybeans, cover crops can also be effectively used with many other cash crops such as wheat, other small grains, sunflowers or other oilseeds, or vegetable crops.

If cover cropping is a practice that you want to encourage in your farm transition plan, then it is important to recognize the long-term investment nature of cover cropping in the way that you structure a rental, lease, or sale agreement. There are costs to planting and then plowing down a cover crop, and a time cost of managing a complex system. There are multiple benefits to cover cropping, but they build up over time and it may take several years to see the benefits.

Some things to consider:

- Converting all or part of a farm operation to cover cropping is a situation in which it might make sense to use a "stepped rent" together with a long-term lease, with payments lower in the first few years than in subsequent years. If the land will be sold, structuring the payments to be lower in the first few years would help encourage cover cropping.
- As the long-term benefits of cover cropping become more clear, conservation programs (public and private) are stepping in to offer incentive payments for cover cropping. Program payments can be part of the financing for a farm that uses cover cropping.
- Landowners might consider giving the farm operator a credit for the extra management work that leads to long-term improvement of the soil.
- Retiring farmers and landowners who want to see cover cropping happen on their land will also need to clearly specify this requirement in the terms of any agreement, because it isn't the easiest choice for a farmer to make when it comes to labor and management costs. See Conservation Financing for more information about options for rent or lease terms.

Cover Crop Yield Gain

Cover crops may be especially beneficial for the subsequent cash crop yields in a drought year. Survey results in the Corn Belt in late 2012, a year of widespread drought, showed that farmers who had used cover crops in the previous season had an average of 9.6% greater corn yields and 11.6% greater soybean yields than farmers who had not used cover crops (1).

In the worst drought-affected areas, the yield increases were even higher with cover crops: 11% for corn, and 14.3% for soybean. This may have been due to greater water-holding capacity of soils in a cover-cropping system, and shading and cooling of the soil by the cover crop. Yield differences may be less dramatic or nonexistent in years with enough rainfall throughout the entire growing season. Not every year is a drought year, but many years have dry soil conditions for part of the growing season. Cover crops are good insurance against the risk of unpredictable weather.

This estimate of yield increases due to cover crops uses the Cover Crop Survey data (1), with some assumptions:

- Yield increase of 6% for corn and 11% for soybean when cover crops are used, based on survey data from farmers with less than three years of experience in cover crop use.
- One in three years might have weather conditions such that cover crop use could provide a yield boost. (On some soils and in some areas, that might be every year.)
- Five-year average corn and soybean yields and prices are from an Iowa study (2).

Example yield boost from cover crops:

- 194 bu/acre of corn x 1.06 = 206 bu/acre; 12 bu/acre gain
- 12 bu/acre x $4.35/bu = $52.20/acre gain from corn yield increase
- 50 bu/acre of soybean x 1.11 = 55.5 bu/acre; 5.5 bu/acre gain
- 5.5 bu/acre x $9.95/bu = $54.73/acre gain from soybean yield increases
- Average $ gain from corn and soybean crops: ($52.20 + $54.73)/2 = $53.46/acre
- Divide by three, for the one-year-in-three yield gain assumption: = $17.82/acre

Rounded figure: $18/acre/year estimated gain from a corn and soybean rotation when cover crops are used.

Continued on next page …

Cover Crop Yield Gains, pg. 2

References:

(1) **2012-2013 Cover Crop Survey**. June 2013. Steve Werblow and Chad Watts. Conservation Technology Information Center (CTIC) and North Central Region SARE. www.ctic.org/media/pdf/Cover%20Crops/SARE-CTIC%20Cover%20Crop%20Survey%202013.pdf (accessed 8/9/13)

(2) **Energy and Economic Returns by Crop Rotation.** September 2012. Ann M. Johanns, Craig Chase, and Matt Liebmann. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-90.html (accessed 8/12/13).

Cover Cropping			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Conserves soil moisture Adds valuable organic material to the soil Scavenges and holds nutrients that might otherwise be lost from the soil Protects water quality by holding soil and nutrients in place Increases diversity of plant species on the farm and may improve wildlife habitat Helps reduce weeds May allow reduced herbicide application on the cash crop Helps break pest and disease cycles **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Cost of cover crop seed blend: $20 to $35 per acre, depending on cover crop types chosen (4) Cost of aerial seeding into standing corn or soybean crop: $15 per acre (4) Cost of killing the cover crop prior to planting the cash crop: $16/acre for tillage method, $7/acre for ground spraying, $10/acre for aerial spraying (6) Management cost for dealing with a more-complex system than corn & soybean: estimate at ¼ of crop rotation "Complexity Cost," so $15/acre *(see Complexity Cost text box in Crop Rotation section)*	Corn and soybean income gain from yield gains per acre following cover crop; $18/acre *(see Cover Crop Yield Gain textbox)* Avoided cost of nitrogen fertilizer because of nitrogen supplied by a legume cover crop: $18/acre *(see Cover Crop Nitrogen text box)* $8.60/acre/year gain in fertilizer value of soil by saving 4.1 tons/acre/year from soil erosion; cumulative over years *(see Value of Saving Soil text box in Crop Rotation section)* Benefit to society: approximately $20/acre/year gain in water quality value of soil by saving 4.1 tons/acre/year of soil from erosion *(see Value of Saving Soil text box in Crop Rotation section)*	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **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

(2) **Winter Cover Crops.** 2010. Kristine Moncada and Craig Sheaffer. In *Organic Risk Management.* Eds. Kristine Moncada and Craig Sheaffer. University of Minnesota. www.organicriskmanagement.umn.edu/winter_cover13.html (accessed 9/03/13).

(3) **Managing Cover Crops Profitably.** 2007. Sustainable Agriculture Research and Education (SARE), USDA. www.northcentralsare.org/Educational-Resources/Books/Managing-Cover-Crops-Profitably-3rd-Edition (accessed 9/03/13).

(4) **Aerial Seeding Cover Crops**. 2012. Allamakee Soil & Water Conservation District. http://allamakeeswcd.org/aerial-seeding-cover-crops/

(5) **2012-2013 Cover Crop Survey**. June 2013. Steve Werblow and Chad Watts. Conservation Technology Information Center (CTIC) and North Central Region SARE. www.ctic.org/media/pdf/Cover%20Crops/SARE-CTIC%20Cover%20Crop%20Survey%202013.pdf (accessed 8/9/13)

(6) **2013 Iowa Farm Custom Rate Survey**. March 2013. William Edwards, Ann Johanns, and Andy Chamra. In *Ag Decision Maker*, Iowa State University Extension and Outreach. www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf

Further Resources:

Cover Crop Chart: An intuitive educational resource for extension professionals. 2013. Liebig, M.A., H.A. Johnson, D.W. Archer, J.R. Hendrickson, K.A. Nichols, M.R. Schmer, and D.L. Tanaka. Journal of Extension [Online], 51(3) Article 3TOT7. Available at www.joe.org/joe/2013june/tt7.php. (accessed 9/03/13).
Visually similar to the periodic table, the CCC includes information on 46 cover crop species and provides information regarding the suitability of these crops for addressing different production and natural resource goals.

Cover Crop Decision Tools. Midwest Cover Crops Council. www.mccc.msu.edu/selectorINTRO.html (accessed 9/03/13).

This online resource has cover crop information specific to seven states and the province of Ontario, and allows you to enter your farm's information to build a plan specific to your farm.

Using Cover Crops to Improve Soil and Water Quality. 2009. James Hoorman. The Ohio State University Extension. http://mercer.osu.edu/topics/agriculture-and-natural-resources/Using%20Cover%20crops%20SAG%2008%2009.pdf (accessed 9/03/13).
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.

Winter Cover Crops. 2010. Kristine Moncada and Craig Sheaffer. In *Organic Risk Management.* Eds. Kristine Moncada and Craig Sheaffer. University of Minnesota. www.organicriskmanagement.umn.edu/winter_cover13.html (accessed 9/03/13).
This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest, but includes a lot of good basic agronomic and soil science information that is useful to non-organic farmers as well.

Soil Health. Burleigh County, North Dakota Soil and Water Conservation District. www.bcscd.com/?id=23 (accessed 6/11/13)
This county-based program offers a number of useful resources on soil management and cover crops.

Special Report on Burleigh County's Soil Health Team.
www.landstewardshipproject.org/repository/1/676/soil_health_lsl_package_final.pdf
The Land Stewardship Project has developed a series of articles on what farmers, conservationists and scientists are doing in one North Dakota Soil Conservation District to build healthy soils using cover crop cocktails and other methods.

Agroforestry

Agroforestry means growing woody species – trees and shrubs – together with crops, livestock, or both in a farming system. The woody plants can help maintain air, water and soil quality; diversify income sources; conserve energy; improve wildlife habitats; and improve total productivity of the farm.

Energy Savings from Windbreaks

How much can you save on energy bills by having windbreaks or shelterbelts around your home? Research in Canada indicated a 27% fuel savings from having good shelter around a mobile home. Anecdotal evidence suggests the savings over time may be as high as 40%. The USDA-NRCS estimates a 10% to 25% energy savings from having a good windbreak around your house (1). Exact energy savings depend on the size and density of the windbreak, the insulation in the home, and the fuel source.

The majority of homes in Minnesota (68%), Iowa (67%), and Wisconsin (66%) use natural gas as their heating fuel (2), and average residential gas usage for the northern Midwest is around 100 mCF (mCF = 1,000 Cubic Feet)(3). Cost of natural gas for residential use in 2012 averaged $10.66 per mCF (4).

Assuming a 20% fuel savings from having a good windbreak, use of natural gas as the fuel, and an average home:

- $10.66/mCF x 100 mCF = $1,066 winter heating cost.
- $1,066 x 0.20 = $213 annual household fuel savings

References:

(1) **Conservation Practices that Save: Windbreaks and Shelterbelts**. November 2006. USDA Natural Resources Conservation Service. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_023631.pdf (accessed 8/12/13).
(2) **Clean Energy in My State**. United States Department of Energy; Energy Efficiency and Renewable Energy. http://apps1.eere.energy.gov/states/ (accessed 8/12/13).
(3) **Trends in U.S. Residential Natural Gas Consumpti**on. June 2010. U.S. Energy Information Administration, Office of Oil and Gas. www.eia.gov/ftproot/features/ngtrendsresidcon.pdf
(4) **Short-Term Energy Outlook**. August 6, 2013. U.S. Energy Information Administration. www.eia.gov/forecasts/steo/report/natgas.cfm

The National Agroforestry Laboratory calls agroforestry plantings “working trees” and defines them as “The right trees planted in the right places for the right reasons. (1)” Some types of agroforestry systems (1,2) :

- Silvopasture: This is a system of growing trees for various purposes, and managing the space between the tree trunks for grazing by livestock. One example is fruit or nut orchards where cattle or sheep graze between the trees. It also applies to woodlots or other types of forests where cattle graze.

- Alley cropping: An agricultural crop that produces annual income is grown in the alleys between widely spaced rows of trees, while the trees themselves are an investment that will produce revenue over the long term. The trees might be Christmas trees or nut trees or fruit trees; or trees grown to eventually produce lumber or firewood.

- Windbreaks: Planting rows of trees and shrubs strategically to block wind is an agroforestry strategy that can be applied in several useful places on the farm. Along roadways, they act as living snow fences to reduce drifting soil or snow. Around the farm buildings they provide energy savings and around livestock feeding areas they reduce environmental stress on livestock by blocking cold winds in winter and providing shade in summer. Planted in crop fields, windbreaks reduce soil erosion due to wind and protect young crops from wind damage. The trees and shrubs used for windbreaks can include fruit or nut trees or trees with high-value lumber, which generate income for the farm as well as provide the benefits of a windbreak.

- Buffer strips, filter strips, riparian buffers: These types of plantings are given different names depending on where they are placed on the landscape and their specific intention. As a broad group, these types of agroforestry practices are used to achieve soil and water conservation goals. They may not produce a crop that can be harvested or sold, but they have a benefit to the farm system as a whole. Buffer strips and filter strips, or “block” plantings that are wider than strips, can be used between crop fields or livestock areas and surface waters like streams, rivers and lakes to reduce the soil and chemical runoff that reaches the water.

- Forest farming: Tree plantings are managed for lumber or other wood products, and the ground between the trees is planted to a harvestable crop such as ginseng. This is different from alley cropping because the trees are not in rows with annual crops between the rows. The appearance of the area is like a forest and the crops grown are specialty crops that grow in woodlands.

- Agroforestry also includes plantings of woody species that are intended to be the sole crop from those planted acres. Hybrid poplar and hybrid willow plantings, for example, are done with the intent of letting the trees grow for one to several decades, and then harvesting them for industrial uses like biofuel or paper production. These types of plantings are often called “plantations.”

Considerations for Landowners

Agroforestry practices can be very beneficial to the farm as a whole and to the environment, but the up-front costs to establish agroforestry plantings can be high and they do take some land away from row-crop or livestock production. If you want to see agroforestry practices happen on your land in the future, here are some things to consider:

- Correct placement of these practices on the landscape is important to achieve maximum benefits. You may be able to put them on acres that are not the most productive for row crops. Either you or the future farm operator needs to do some research and planning to figure out where to plant the trees, and you may want to enlist help from your local Natural Resources Conservation Service (NRCS) office. Find your local office: http://offices.sc.egov.usda.gov/locator/app?agency=nrcs

- The NRCS encourages agroforestry and has cost-sharing available for establishment and upkeep of many of the practices (2). This is another good reason to work with your local NRCS office.

- Establishment cost-sharing and annual payments may be available from agencies other than NRCS for some agroforestry practices. For instance, Minnesota Department of Transportation (MN-DOT) pays for living snow fence establishment along some roadways affected by blowing snow (3).

- The new farmer on your land can put "sweat equity" into getting these practices established and then maintaining them. Consider valuing that effort as part of the purchase price of the land or finding another way to credit it in a long-term lease.

- Establishment is a major effort that involves site preparation; planting and installation of a weed barrier; and then about three years of fairly intensive mowing, watering, spot spraying, and replanting of dead trees (3).

- Since agroforestry practices do remove land from annual crop production, that loss of potential cash-crop income needs to be figured into the overall lease or sale price of the land. The benefits of the agroforestry practices go to the farm operator, the landowner, and to society; so your plan for determining the sale or lease price should similarly divide the cost of the practice. As mentioned above, cost-sharing from the NRCS can help with establishment and upkeep costs.

- Some agroforestry practices have the potential to generate income for several years to several decades, and there should be a plan for who will profit from that in the future. If establishment costs and risks and upkeep costs are shared between landowner and farm operator, then the income rewards should also be shared.

Agroforestry			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Helps landowner and farm operator diversify income sources through sales of nuts, wood, fruit, biofuels, etc. Enhance the productivity of crops and livestock by providing shade and protection from harsh winds (4) Reduce soil erosion due to wind Enhance wildlife habitat Trees capture & store carbon dioxide from the air Improve water quality by trapping sediment and other run-off before it reaches surface waters	Establishment costs for living snow fence (also applicable to buffer strips, windbreaks, shelterbelts, including those used in alley cropping): $2,260/acre *(see Establishment & Maintenance Costs textbox)* Range of establishment costs: $1,500 to $3,000 (3); or up to $7,000 for hazelnuts (9) Average yearly costs for first three years of maintenance (establishment phase): $280/acre/year *(see Establishment & Maintenance Costs text box)* Maintenance costs beyond 3rd year: $24/acre/year for spot spraying (3)	Income from black walnut crop, years 11-60: $255/year (6) Income from hazelnut crop, years 5-10: $313/acre/year (261 lbs./acre/year x $1.20/lb.) (7,8) Net gain of $240/year in crop income per acre of windbreak (see *Yield Gain/Loss from Windbreak* text box) $210/year energy savings for home heating due to windbreak around farm house (see *Energy Savings from Windbreaks* text box) Cost-sharing for establishment from state or federal agency (such as NRCS or MN-DOT) may cover up to 90% of cost Annual payment for conservation contract with state or federal agency or private organization (varies)	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by number of acres devoted to the practice: Multiply by a time frame (5 years? 10 years?) Total value over time:

The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.	Loss of net income from cash crop on the agroforestry acres: $230/acre/year *(See Corn and Soybean Profitability text box in the Crop Rotation section).* Reduce this number if planting on less-productive acres. $30/acre/year cost for the acreage of the windbreak, for extra time and hassle in field operations (tillage, spraying, and harvesting) to maneuver around the area (3) ****Note**: See "Economic Budgeting for Agroforestry Practices" (6) for a sample budget for black walnut establishment.	MN-DOT estimates $17 benefit in avoided snow removal and vehicle accident costs for every $1 invested in living snow fence (3). This is a benefit to society but also to the landowner and/or farm operator if the improved roads are ones they frequently drive. Benefits of reduced drifting could also apply to windbreaks established along driveways and field roads within the farm itself.	

References:

(1) **Working Trees.** USDA National Agroforestry Center and United States Forest Service. http://nac.unl.edu/Working_Trees/infosheets.htm (accessed 8/12/13).

(2) **Sustaining Agroforestry Systems for Farms and Ranches**. USDA Natural Resources Conservation Service**.** www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/forestry/sustain/ (accessed 8/12/13).

(3) **Economic and Environmental Costs and Benefits of Living Snow Fences: Safety, Mobility, and Transportation Authority Benefits, Farmer Costs, and Carbon Impacts**. February 2012. Gary Wyatt, University of Minnesota Extension; Minnesota Department of Transportation Research Services. www.lrrb.org/media/reports/201203.pdf (accessed 8/12/13).

(4) **What does it take to earn a living on the farm?** April, 2013. Gary Hachfeld, University of Minnesota Extension. http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_440374.pdf (accessed 8/06/13)

(5) **Energy and Economic Returns by Crop Rotation.** September 2012. Ann M. Johanns, Craig Chase, and Matt Liebmann. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-90.html (accessed 8/12/13).

(6) **Economic Budgeting for Agroforestry Practices**. 2012. Larry Godsey. Center for Agroforestry, University of Missouri. www.centerforagroforestry.org/pubs/economichandbook.pdf (accessed 8/12/13).

(7) **Hazelnut Production Potential in the Upper Midwest: A Report on Hybrid Hazelnut Yields**. 2011. Jason Fischbach, Lois Braun, Mike Demchik, and Don Wyse. University of Wisconsin Extension. www.midwesthazelnuts.org/assets/files/Research%20Bulletin%2017_hybrid%20hazelnut%20yields.pdf (accessed 8/12/13).

(8) **Fruit and Tree Nut Yearbook**. 2011. USDA Economic Research Service. Table E-10: Hazelnuts: Production, Price, Value, U.S. 80-to date. http://usda.mannlib.cornell.edu/MannUsda/viewStaticPage.do?url=http://usda01.library.cornell.edu/usda/ers/./89022/2011/index.html (accessed 8/12/13).

(9) **Setting a Yield Goal for Hazelnut Breeding in the Upper Midwest**. 2012. Jason Fischbach and Lois Braun. University of Wisconsin Extension. www.midwesthazelnuts.org/assets/files/breeding%20goals_final.pdf (accessed 8/12/13).

Further Resources:

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.

Profitable Farms and Woodlands: USDA National Agroforestry Center and Tennessee State University, 2012.
http://nac.unl.edu/documents/morepublications/profitable_farms.pdf
Manual (108 pages) to help landowners develop best management technologies in managing agroforestry projects.

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.

Establishment & Maintenance Costs for a Living Snow Fence
(also applicable to windbreaks, shelterbelts and buffer strips with similar establishment procedures)

These figures were collected from interviews with farmers in southern Minnesota; also interviews and surveys of staff with Minnesota Department of Transportation (MN-DOT), Farm Service Agency, Natural Resources Conservation Service, and Soil and Water Conservation Districts.

Establishment costs:

- Land preparation, tillage + herbicide: $60 to $82 per acre; average $71/acre
- Planting trees and shrubs: $282 to $872 per acre, depending on tree species and other plants selected; average $464/acre
- Geotextile fabric purchase and installation as a weed barrier: $950 to $2,500 per acre; average $1,725/acre

Average establishment cost per acre: $71 + $464 + $1,725 = $2,260

Maintenance costs during 3-year establishment phase:

Years 1 & 2:

- $37 to $50 per acre per year for mowing; average $43/acre/year
- $200 to $400 per acre per year for watering; average $300/acre/year
- $20 to $50 per acre one-time replanting; average $15/acre/year
- $24/acre/year for spot spraying

Total average maintenance cost per year for first two years: $43 + $300 + $15 + $24 = $382

3rd year:

- $37 to $50 per acre per year for mowing; average $43/acre/year
- $24/acre/year for spot spraying

Total cost for third year: $43 + $24 = $67/acre

Average cost per year for first three years: ($382 + $382 + $67)/3 = $277/acre/year
Rounded = $280/acre/year

continued on next page …

Establishment & Maintenance Costs for a Living Snow Fence (pg. 2)

Reference:

Economic and Environmental Costs and Benefits of Living Snow Fences: Safety, Mobility, and Transportation Authority Benefits, Farmer Costs, and Carbon Impacts. February 2012. Gary Wyatt, University of Minnesota Extension; Minnesota Department of Transportation Research Services. www.lrrb.org/media/reports/201203.pdf .

Yield Gain/Loss from Windbreak

Farmers in Minnesota estimate a 10% to 15% loss of crop yield in the areas right next to a Living Snow Fence (1). Similar yield reductions have been seen right next to windbreaks or shelterbelts. These losses are seen out to a distance equal to about twice the height of the windbreak.

On the leeward (downwind) side, however; beyond a distance equal to twice the height of the windbreak; the yield reductions end. From a distance of two times the height out to a distance of 12 times the height of the windbreak, there is a yield increase of 5% to 25%, depending on the crop. Beyond 12 times the height of the windbreak, yields return to the field average.

Corn yield loss from 1 acre of windbreak, 33 ft. wide x ¼ mile long, with tree height of 12 ft.:

- Area affected by yield reduction: ¼ mile (1,320 ft.) x 24 ft. = 31,680 ft^2 = 0.73 acres
- Assume a 12% yield reduction for corn in the 24-ft. wide yield reduction area.
- Assume yield of 194 bu./acre of corn and price of $4.35/bu. (4)
- Lost income from crop yield reduction, per acre: 194 bu./acre x 0.12 = 23 bu.; x $4.35/bu = $100/acre/year loss
- $100/acre/year x 0.73 acres = $73/year loss from the yield reduction area.

Corn yield gain from the same 1 acre of windbreak, 33 ft. wide x ¼ mile long, with tree height of 12 ft.:

- Area affected by yield gain: ¼ mile (1,320 ft.) x 120 ft. = 158,400 ft^2 = 3.64 acres
- Assume a 12% yield increase for corn in the 120-ft. wide yield increase area (3)
- Assume yield of 194 bu./acre of corn and price of $4.35/bu. (4)
- Gained income from crop yield increase, per acre: 194/bu./acre x 0.12 = 23 bu.; x $4.35/bu = $100/acre/year gain
- $100/acre/year x 3.64 acres = $364/year gain from the yield increase area

Net gain per year in corn income due to windbreak:

$364 gain - $73 loss = $291/year net gain (rounded to $290).

Yield Gain/Loss from Windbreak, continued (pg. 2)

Similar calculations for soybean, assuming a 13% yield loss or gain (3):

- Assume yield of 50 bu./acre of soybean and price of $9.95/bu (4).

Lost income from soybean crop yield reduction on 0.73 acres:

- 50 bu./acre x 0.13 = 6.5 bu.; x $9.95 = $65/acre/year loss
- $65/acre/year x 0.73 acres = $47/year loss from the yield reduction area.

Gained income from soybean crop yield increase on 3.64 acres:

- 50 bu./acre x 0.13 = 6.5 bu.; x $9.95 = $65/acre/year gain
- $65/acre/year x 3.64 acres = $237/year gain from the yield increase area.

Net gain per year in soybean income due to windbreak:
$237 gain - $47 loss = $190/year net gain

Average net gain per year from a 1-acre windbreak with a corn/soybean system:
($290 for corn +$190 for soybean)/2 = $240/year.

References:

(1) Economic and Environmental Costs and Benefits of Living Snow Fences: Safety, Mobility, and Transportation Authority Benefits, Farmer Costs, and Carbon Impacts. February 2012. Gary Wyatt, University of Minnesota Extension; Minnesota Department of Transportation Research Services. www.lrrb.org/media/reports/201203.pdf (accessed 8/12/13).

(2) Conservation Practices that Save: Windbreaks and Shelterbelts. November 2006. USDA Natural Resources Conservation Service. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_023631.pdf (accessed 8/12/13).

(3) Windbreaks. 2006. Chapter 6 in *Training Manual for Applied Agroforestry Practices*. Center for Agroforestry, University of Missouri. www.centerforagroforestry.org/pubs/training/sec6.pdf (accessed 8/12/13).

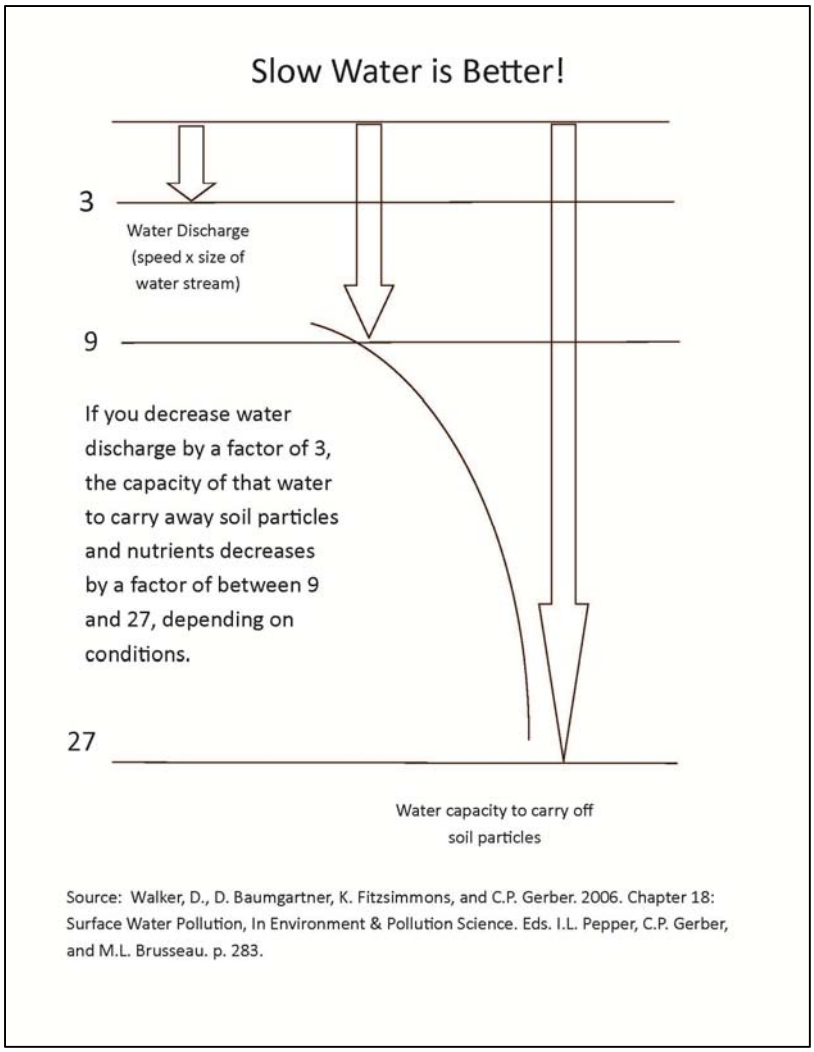
(4) Energy and Economic Returns by Crop Rotation. September 2012. Ann M. Johanns, Craig Chase, and Matt Liebmann. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-90.html (accessed 8/12/13).

Water Quality Management

Sustainable agriculture practices detailed in other sections of this publication are important ways to maintain or improve water quality on the farm and downstream from the farm.

- Crop rotations and cover crops can help cut down nitrogen fertilizer applications, which reduces nitrogen leaching into groundwater or runoff into streams and rivers.
- Properly applied manure used as a fertilizer can reduce problems of livestock manure runoff into surface waters.
- Agroforestry practices like buffer strips between fields and waterways can slow water runoff and trap soil particles and agricultural chemicals, preventing them from entering the waterway.
- Cover crops help hold nutrients, pesticides and soil particles in place. They do so by keeping roots in the ground to hold onto soil, and by cushioning the impact of raindrops and slowing down water runoff.

Water runoff with no surface cover to slow it down can be devastating to soil. Consider an example from May 4, 2003. Researchers tracked rainfall, runoff, and soil erosion over the entire state of Iowa on that date. Three townships in western Iowa received 5 inches of rain. They had average water runoff rates of 0.6 to 1.25 inches, and had average soil losses of 4.5 tons/acre from that single rainfall event (1). If the water discharge rate had been slowed down by a factor of three through use of conservation practices, then the capacity of that water to carry away sediment and nutrients could have dropped by a factor of nine to 27, so the soil loss from that heavy rain could have been limited to 0.5 tons/acre or less (2).



Wetland Restoration

Restoring wetlands on the farm is another idea to consider for water quality improvement. We use the term "restoring" or "restoration" for wetland construction because in most cases, low-lying or wet areas on the farm were once wetlands before the land was first converted to agriculture. Wetland restoration projects are often put in place on areas of a farm that are marginal or poor for growing corn or soybeans — acres that are producing yields of half or even less of the farm's average yields. Well-designed and placed wetlands can reduce nitrate losses from surrounding fields into surface waters by 40% to 90% (3). They can serve as water-quality buffers for more than one farm, and indeed for an entire watershed. The Wetlands Initiative estimates that putting less than 8% of the land area around a creek into carefully placed wetlands could reduce the nitrate pollution of that creek by 43% (4).

Wetlands can attract a variety of wildlife including frogs, ducks and other waterbirds, and turtles and other reptiles; as well as mammals like deer and raccoons that may visit the wetland to find food or drink. The NRCS reports that its Wetland Reserve Program has restored 2.6 million acres of private wetlands nationwide, providing essential breeding habitat for waterbirds and wintering habitat for 3.5 to 4.5 million waterfowl every winter. According to The State of the Birds report, "…private lands have critical conservation value, and … landowners can measure their yield not only in bushels and head and cords, but also in bluebirds, hawks, and canvasbacks (5)." There may be a "hassle factor" for a farmer in maneuvering equipment around the wetland; but that may be balanced by the reduced hassle of no longer trying to till and plant an area that was perpetually wetter than the rest of the field.

A retiring farmer or landowner who wants to see wetlands established on their property should make a plan for who will work with federal or state agencies or private organizations to get cost-share assistance and negotiate contracts and/or easements for those wetland acres. Will that background work be done by the retiring farmer or landowner, or will it be the new farm operator? If it is to be the new farm operator, that person should receive some form of compensation or credit for the background and paperwork they do prior to the actual construction of the wetland. Alternatively, a landowner who doesn't want an easement agreement with a public or private entity may choose to self-finance the wetland establishment and hire a contractor to do the construction work; or the new farm operator may put "sweat equity" into the construction work and receive a land value or rent credit for that work.

Once established, wetlands can be treated as a feature of the farm landscape. Fields around the wetland can be handled with annual rent, short-term or long-term lease, or sale of the land. Any rent, lease, or sale agreement should specify the boundaries of the wetland and include statements preventing destruction of any part of the wetland. If a conservation easement is established with a federal or state agency or private organization, that easement provides another level of protection for the wetland.

In the future, there may be a market for the ecosystem services such as nitrate removal that a wetland provides. Organizations such as The Wetlands Institute (TWI) are researching the potential for such markets (4). Investment in a wetland now could be partially a speculative move with an eye toward future payments for ecosystem services.

Nitrate Removal Services

Wetlands are effective at removing nitrate from waters that flow into the wetland. Monitoring of CREP-funded wetlands in Iowa found that they removed 40% to 90% of nitrate flowing in, when water flow levels were low to moderate (1). During floods, water may enter and leave the wetland too quickly for nitrate removal to occur.

The figures used in the following calculation come from research conducted at Michigan State University, published in 2001 (2). More recent figures presented by The Wetlands Initiative (3) indicate that the dollar figures used in the 2001 research are still relevant in 2013.

The Hennepin Levee District in Illinois involved 2,490 acres of wetlands and could remove an estimated 494 tons of nitrate per year, based on a 75% nitrogen removal rate (2).

- 494 tons nitrate per year / 2,490 acres = 0.2 tons nitrate/acre/year removal by wetland
- Cost of nitrate removal by a water treatment plant: $36,000/ton (2)
  Cost range: $30,000/ton to $94,000/ton (3)
- Cost of nitrate removal by wetland, based on cost of taking land out of production and cost of construction: $5,500/ton
  Cost range: $540 to $5,500/ton (2)
- $36,000/ton cost of nitrate removal by treatment plant, less $5,500/ton cost of nitrate removal by wetland = $30,500/ton of nitrate in “free” or “net profit” ecosystem services provided by the wetland
- $30,500/ton of nitrate removed x 0.2 tons/nitrate/acre/year removal by wetland = $6,100/acre/year ecosystem services value of the wetland
- $30,500/2 = $15,250/ton of nitrate removed: half of the value of the “net profit” in ecosystem services is an estimate of what a watershed district might be willing to pay to purchase the nitrate reduction credit (2).
- $15,250/ton of nitrate removed x 0.2 tons nitrate/acre/year removal by wetland = $3,050/acre/year potentially marketable ecosystem services value of the wetland.

continued on next page …

Nitrate Removal Services, continued (pg. 2)

Note that nitrate removal is only one ecosystem service of the wetland, one that happens to be fairly measurable. Other wetland services such as wildlife habitat are valuable, but harder to calculate.

References:

(1) **2012 Annual Report on Performance of Iowa CREP Wetlands: Monitoring and Evaluation of Wetland Performance.** William Crumpton and Greg Stenback. Department of Ecology, Evolution and Organismal Biology, Iowa State University, Ames, IA. http://iowacrep.ag.iastate.edu/sites/default/files/2012%20CREP%20Wetland%20Monitoring%20and%20Evaluation.pdf (accessed 8/15/13).

(2) **Using Illinois River Floodplains for Nitrate Removal: TWI's Hennepin Levee District Example.** Chapter 3.3 in Cheng, C.W., & Pierre, J.M.S. (2001). *A Resting Place for Ducks: A Multidisciplinary Analysis of Floodplain Restoration of the Hennepin Levee District, Illinois: A Master's Project Submitted in Partial Fulfillment … for the Degree of Master of Science and Master of Landscape Architecture (School of Natural Resources and Environment) …University of Michigan.* www.snre.umich.edu/ecomgt/pubs/wetlands/hennepin/3.3.PDF (accessed 8/15/13).

(3) **Growing Wetlands for Clean Water: Using markets to pay for efficient nutrient removal in the Farm Belt.** December 2012. The Wetlands Initiative. www.wetlands-initiative.org/images/pdf-docs/growing_wetlands_for_clean_water.pdf

Potential funding and information sources for wetland restoration (not a complete list):

- NRCS Wetland Reserve Program (WRP) www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/
- Farm Service Agency (FSA) Conservation Reserve Enhancement Program (CREP) www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep
- North American Wetland Conservation Act (NAWCA) www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm
- The Wetlands Initiative (TWI) www.wetlands-initiative.org/
- The NRCS and Farm Service Agency (FSA) usually share office space. Find your local office: http://offices.sc.egov.usda.gov/locator/app?agency=nrcs

Wetland Restoration			
	- Column	**+ Column**	
Qualitative Benefits of the practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Reduces sediment, nitrogen and other chemical runoff into streams and rivers Creates wildlife habitat Flood mitigation Increases plant and animal species diversity **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Loss of net income from cash crop on the wetland acres: $115/acre/year *(See Corn & Soybean Profitability text box in Crop Rotation section; wetlands can be placed on acres producing less than 50% of the farm average yield.)* Wetland establishment cost, national average of $1,280/acre, 2009 dollars (6)	Benefit to society: Value of nitrate removal services: $6,100/acre of wetland/year *(No, this is not a typo. See Nitrate Removal Services text box)* Up to 100% of wetland restoration cost from NRCS in exchange for a permanent easement; 75% of cost for a 30-year easement (7). Cost-sharing may also be available from other public or private sources. Annual payment for conservation contract with state or federal agency or private organization (varies) – or – upfront purchase of easement, spread over 15 years: $80 to $150/acre/year.	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by number of acres devoted to the practice: Multiply by a time frame (30 years?) Total value over time:

References:

(1) **Daily estimates of rainfall, water runoff, and soil erosion in Iowa**. 2006. R. Cruse, D. Flanagan, J. Frankenberger, B. Gelder, D. Herzmann, D. James, W. Krajewski, M. Kraszewski, J. Laflen, J. Opsomer, and D. Todey. *Journal of Soil and Water Conservation*. 61(4):191-199.

(2) **Chapter 18: Surface Water Pollution**. 2006. In *Environment & Pollution Science*. Walker, D., D. Baumgartner, K. Fitzsimmons, and C.P. Gerber. Eds. I.L. Pepper, C.P. Gerber, and M.L. Brusseau. p. 283.

(3) **2012 Annual Report on Performance of Iowa CREP Wetlands: Monitoring and Evaluation of Wetland Performance.** William Crumpton and Greg Stenback. Department of Ecology, Evolution and Organismal Biology, Iowa State University, Ames, IA. http://iowacrep.ag.iastate.edu/sites/default/files/2012%20CREP%20Wetland%20Monitoring%20and%20Evaluation.pdf (accessed 8/15/13).

(4) **Growing Wetlands for Clean Water: Using markets to pay for efficient nutrient removal in the Farm Belt.** December 2012. The Wetlands Initiative. www.wetlands-initiative.org/images/pdf-docs/growing_wetlands_for_clean_water.pdf (accessed 8/15/13).

(5) **The State of the Birds 2013: Report on Private Lands, United States of America**. www.stateofthebirds.org (accessed 8/15/13).

(6) **Wetland Reserve Program: Final Programmatic Environmental Assessment**. January 2009. USDA Natural Resources Conservation Service. www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_006911.pdf (accessed 8/15/13).

(7) **Wetland Reserve Program**. USDA Natural Resources Conservation Service. www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/ (accessed 8/15/13).

Further Resources:

Practices to Improve Water Quality. June 2012. Leopold Center for Sustainable Agriculture, Iowa State University. www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2012-06-practices-improve-water-quality.pdf (accessed 9/04/13).
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. Discussions of the mechanisms of each practice are also included.

Agricultural Nitrogen Management for Water Quality Protection in the Midwest. Heartland Regional Water Coordination Initiative. www.ksre.ksu.edu/waterquality/nitrogen%20pub.pdf (accessed 9/04/13).
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; and practices to reduce or mitigate losses.

Proceedings of Practical Farmers of Iowa annual conferences, 2012 and 2013. http://practicalfarmers.org/events/annual-conference.html (accessed 9/04/13).
Videos and presentations on a variety of topics, including soil and water conservation.

Managed Grazing in Riparian Areas. 2003. Barbara Bellows. Appropriate Technology Transfer for Rural 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.

Protecting Riparian Areas, Farmland Management Strategies. 2003. Barbara Bellows. Appropriate Technology Transfer for Rural Areas (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. 2003. Barbara Bellows. Appropriate Technology Transfer for Rural Areas (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 & Specialty Crops

For growers in the Midwest, anything other than corn and soybeans can be considered an alternative crop. Alternative crops such as small grains (oats, wheat, rye, barley) and oilseed crops (canola, safflower, sunflower) can be grown as part of a crop rotation on large acreages. Legume crops such as alfalfa and dry beans can help build soil by hosting bacteria on their roots that "fix" atmospheric nitrogen into the soil. Alternative crops in the rotation can help reduce disease and insect problems, as well as diversify a farming operation to spread income out more evenly during the year.

"Specialty" crops like fruits, vegetables, and nuts; and even more unusual specialty enterprises like agritourism and aquaculture (fish farming) can be quite profitable. Fresh fruit and vegetables can return up to $18,000 in net income per acre, or sometimes even significantly more; for example, $54,000 per acre for heirloom tomatoes. However, these high-dollar estimates do not include marketing costs (1). Based on farmers' financial reports from 2008 through 2011 in Minnesota, average net income was about $1,800 per acre for mixed vegetable

Labor Hours for Fruit & Vegetable Specialty Crops

Financial records from 2008 through 2011 were collected from specialty crop farmers in Minnesota as part of a USDA-funded Specialty Crop Block Grant. The records included the farmers' reports of time requirements to plant and manage various crops:

Specialty Crop	Labor Hours/Acre/Year
Apples (avg.)	160
Apples (2011)	236
Blueberries	482
Cantaloupe	161
Grapes	186
Pumpkins	70
Raspberries	138
Strawberries	235
Mixed Vegetables	287
AVERAGE	217 (round: 220)

A charge for these labor hours is already included in the calculation of net income per acre per year for fruit and vegetable specialty crops, so you would not reduce the net income figure based on these hours of labor. The labor hours are shown here to illustrate that the time commitment is high, and there is a risk of not always getting all necessary tasks done in time to prevent crop losses.

Reference:

Minnesota Specialty Crops, An Analysis of Profitability and Performance: Minnesota Department of Agriculture www.mda.state.mn.us/~/media/Files/food/organicgrowing/specialtycrop2012.ashx

production and $2,200 for strawberry production (2), so a figure of $2,000/acre/year net income for mixed fruit and vegetable production is used in the costs and benefits table.

Specialty crop operations do not require the large acreages typically seen for grain and forage production operations. A hundred acres would be considered a large vegetable farm in the Midwest. A vegetable or fruit operation in which the farmers sell directly to the public typically involves fewer than 30 acres. This presents an opportunity for a larger-acreage farm to split off smaller parcels that could support one or several new specialty crop farmers.

If alternative crops are something that you want to encourage for the future as part of a crop rotation or if you want to foster a beginning specialty crop farm on your land, then farm transition process should include enterprise budgeting to determine likely cash flows of the future farm(s) and the farmer's ability to pay the rental, lease, or sale price that you want for your property. Your farm's distance from potential markets should be a consideration in deciding whether this is a reasonable option to pursue for your property. Direct-marketing farm operations generally do better when they are close to large urban markets, for instance.

Specialty crops are often a riskier option than cash grain crops. While some Federal crop insurance options are available for some specialty crops, the insurance options are generally much better established and easier to use for cash grains. Some specialty crops are more sensitive to weather variations, diseases, and pests than grains are. Crop protection chemicals (herbicides, insecticides, and fungicides) that are available to grain producers are often not labeled for use on specialty crops. Limited available crop protection tools increases the risk of crop yield reduction or loss of salable product. High labor requirements per acre are also a type of risk. With specialty crops on small acreage, the time required per acre is high and failure to get necessary tasks done in the time window required by the crop can lead to losses.

The farm transition plan should include recognition of all these risks as potential costs and barriers to a new farmer starting up an enterprise. It is also true that the potential profits from a specialty crop can be much greater per acre than from a cash grain crop. Rent, lease, or sale terms can be structured so that the retiring farmer or landowner shares in the risks, but also in the potential rewards from a lucrative specialty crop.

Uninsured/Under-insured Risk

For some specialty crops, it is difficult, very costly, or even impossible to obtain crop insurance. Some specialty crop farmers who have access to insurance still choose to assume all of the risk of loss rather than pay high crop insurance premiums.

Specialty crop farmers have risk due to production costs: they may spend money to plant and tend a crop, but not end up with a crop to sell. These figures show only the lost production costs that have to be made up from somewhere if the crop fails; they don't include lost profit that the farmer may have been counting on to cover family living expenses. These costs are estimates that may not apply to a particular farm's situation.

Iowa State University Extension's Ag Decision Maker spreadsheets for vegetable crops show figures based on a 100' x 4' bed. The table below shows expenses per acre. The per-acre figure was calculated thus:

- 100' x 4' = 400 square feet
- 1 acre = 43,560 square feet
- 43,560 square feet / 400 square feet = 108.9 beds/acre
- Reduce the figure to 100 beds/acre to allow for space between beds or other non-planted areas.

continued on next page …

Uninsured/Underinsured Risk, continued (pg. 2)

Pre-harvest production costs per bed x 100 = Pre-harvest production costs per acre:

Specialty Crop	**Annual crop pre-harvest production costs per acre**
Asparagus	$5,227
Basil	$5,149
Specialty Green Beans	$5,056
Carrots	$2,831
Eggplant	$5,951
Garlic	$9,879
Salad Greens	$2,013
Snow Peas	$6,148
Potatoes	$5,118
Sweet Potatoes	$3,255
Red Raspberries*	$2,946
Strawberries*	$1,902
Cherry Tomatoes	$6,722
Heirloom Tomatoes	$6,722
AVERAGE	$4,923 (round: $5,000)
*Includes annual production costs plus one-year value of establishment costs. The total establishment costs are amortized over 10 years for raspberries and over three years for strawberries.	

Reference:

Ag Decision Maker, Iowa Fruit and Vegetable Production Budgets. Craig Chase. Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-17.html

Alternative & Specialty Crops			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
May reduce pesticide use More profitable choice than corn & soybeans on some soils and in some climates (3) Choice of a suitable alternative crop can reduce or eliminate irrigation water use in dry climates. Restricting irrigation benefits water conservation efforts. Increased species diversity on the landscape **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Risk of uninsured or under-insured loss of production costs for specialty fruit or vegetable crop: $5,000/acre/year *(See Uninsured/Under-insured Risk text box)* High labor requirements per acre of specialty fruit/vegetable crop; average of 220 hours/acre/year *(See Labor Hours text box; 2)* Loss of net income from cash grain crop on the alternative or specialty crop acres: $230/acre/year. *(See Cash Grain Profitability Calculation text box on page 4).* If dryland acres, loss of income from corn/soybean is about $80/acre/year (3)	Specialty fruit and vegetables have widely varying income potential. $2,000/acre/year, net income for mixed fruit and vegetable production; range of $1,200 to $18,100 or potentially higher (note high-end figure does not include marketing costs) (1, 2) Heirloom tomatoes, net income of $54,000/acre/year, not including marketing costs (1) Dry beans, net income of $200/acre/year (3) Confectionary sunflowers, net income of $184/acre/year (3)	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by number of acres devoted to the practice: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **Ag Decision Maker, Iowa Fruit and Vegetable Production Budgets. Craig Chase.** Iowa State University Extension. www.extension.iastate.edu/agdm/crops/html/a1-17.html

(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

(3) **Projected 2012 Crop Budgets, North Central North Dakota**. December 2011. Andrew Swenson and Ron Haugen. North Dakota State University Extension Service. www.ag.ndsu.edu/pubs/agecon/ecguides/nc2012.pdf (accessed 8/19/13)

Further Resources:

Crop Insurance Options for Specialty, Diversified and Organic Farmers. 2012. Jeff Schahczenski. Appropriate Technology Transfer for Rural Areas (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. 2000. Patricia Sauer and Preston Sullivan. Appropriate Technology Transfer for Rural Areas (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. Appropriate Technology Transfer for Rural Areas (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. 2010. Editors: Kristine Moncada and Craig Sheaffer. University of Minnesota. www.organicriskmanagement.umn.edu/alternative_crops.pdf
This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. It includes a lot of good, basic agronomic and soil science information that is useful for non-organic farmers as well.

Perennial Forages and Grazing

Perennial forage plantings are excellent practices for soil and water improvement. An established perennial forage stand is like a sponge, soaking up both water and nutrients and allowing very little of either to escape into groundwater or surface water. Land in a perennial forage crop is not tilled, which is beneficial for soil health. Tillage – plowing, disking, or similar operations – destroys both soil structure and soil organic matter; so the more years in a rotation that the soil is in a perennial crop and not tilled, the better for the soil (1).

Alfalfa Nitrogen Credit

A fair stand of alfalfa on medium-textured soil can provide 160 lbs./acre of nitrogen to the corn crop that comes after it (1). Using a 2012 nitrogen price of $0.60 per lb. (2):

160 lbs. nitrogen/acre x $0.60/lb = $96/acre nitrogen credit from the alfalfa crop

Because breakdown of plant matter in the soil takes place gradually over time, the plowed-down alfalfa crop will also supply nitrogen to the second year of corn after the alfalfa is plowed down.

50 lbs. nitrogen/acre 2nd-year credit (1) x $0.60/lb (2) = $30/acre 2nd-year credit from the alfalfa crop.

References:

(1) **Using Legumes as a Nitrogen Source**. June 1997. L.G. Bundy, K.A. Kelling and L. Ward Good. University of Wisconsin Extension, publication #A3517. http://ipcm.wisc.edu/download/pubsNM/Usinglegumes.pdf

(2) **Fertilizer Use and Price**. Reports from the Economic Research Service, USDA. www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx#26727. (accessed 6/11/13)

Legume forage crops are very useful in crop rotations as a way to break weed, pest and disease cycles and add nitrogen to the soil. Forage crops help reduce weed pressure in several ways. The thick ground cover of forage reduces the amount of sunlight that reaches the soil surface, which prevents some weed seeds from germinating. The forage crop out-competes most weed seedlings that do sprout, and harvest of the forage removes growing weeds before they can produce seeds. Forage crops in a rotation reduce the level of insect pests and diseases because the forage crop is typically not the host plant for insects and diseases that harm cash crops. Having a field planted to something other than the host plant (the grain crop) for at least a year means those insects and disease organisms don't have the food or shelter they need from the host plant in order to complete their life cycle, so they die off (2).

Long-term perennial forage is a reasonable choice to consider on your land's most productive acres. Alfalfa hay production can be financially competitive with cash grain production. Perennial forage also has potential to generate income and environmental benefits on the more marginal land. Acres that produce less than the farm's average yield of corn or soybeans might be more profitable in a forage crop. Acres that are difficult to plant to row crops because they are too steep, too wet, too dry, or are in odd-shaped areas that don't work well with large field equipment are all good candidates for a permanent forage planting.

Many programs administered by the Natural Resources Conservation Service offer incentives for conservation 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).
The Conservation Stewardship Program is a "working lands" program that provides payments for whole farm plans in which acres in perennials can be harvested, either by

Federal Farm-Level Conservation Programs

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/
- Grasslands Reserve Program
  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/
- Farm and Ranch Lands Protection Program
  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/
- Conservation Stewardship Program
  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
- Transition Incentive Program
  www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=tipr

machine or by grazing livestock. The other programs are land retirement programs, in which cost-share is available for planting, nothing is harvested, and contract payments substitute for crop sales (see Federal Farm-Level Conservation Programs text box). If having acreage permanently in perennial grasses or legumes is something you want for your legacy on the land, then these programs can be part of the total package that makes it financially feasible for you or future farmers to plant and maintain those acres. Your local NRCS office can explain the details of these programs, the requirements and restrictions associated with them, and the contract payment amounts. Search for your local NRCS office: http://offices.sc.egov.usda.gov/locator/app?agency=nrcs.

Perennial forages combined with contract grazing can be a good entry option for a beginning farmer. If helping a new farmer get started is part of your family's goal for the land, this is a path to consider. A new farmer can lease or rent acres in perennial forage, get a contract to graze someone else's cattle on those acres, and only have to invest capital in fencing equipment. This type of farmer is called a "grazier" -- a person who manages the grazing of livestock on pastures. Managed grazing can be a profitable, productive, and environmentally beneficial use of land (3). Pasture rental agreements or pasture leases should be structured to be fair to the landowner, the livestock owner, and the grazier (two or three of those roles might be held by the same person). In a typical rental or lease agreement, the landowner is responsible for the perimeter fence and the grazier is responsible for the internal, temporary fences needed to move cattle through the pasture in a managed grazing system (4).

Hay or haylage production requires different planting and harvest equipment than grain production, as well as more labor. Those costs are accounted for in the net income figure for alfalfa, but in spite of those costs being accounted for on paper, they remain a barrier to many farmers who are strapped for time. Dealing with a different set of equipment and a different type of crop adds a level of complexity to a grain farm operation, which requires management effort and knowledge. Those issues are not well captured by traditional accounting methods, but they are costs or barriers that must be considered in a farm transition plan.

If you want to ensure that perennial forages are part of the farming operation on your land in the future, then your expectations for sale, rental, or lease price for your land must match up with what is affordable for a farming operation that includes or is wholly based on perennial forages. For hay crops, leases should be for at least three years to ensure that the farmer gains the benefits from her or his investment in planting a perennial forage crop. The terms of the lease should include a credit to the farm operator for the nitrogen benefit to the next grain crop if a different farmer will have the land after the hay crop is plowed down. With both pasture and hay, consider including a credit to the farm operator for management efforts that contribute to improved soil health and reduced soil erosion and water runoff.

Fencing & Watering Costs

These calculations are based on a 40-acre square pasture, ¼ mile on each side. One mile of fence will enclose the pasture. Other pasture sizes and shapes are very common. Cost per acre of fencing will increase if a smaller area or oddly-shaped area is enclosed. Cost per acre of fencing will decrease if a larger area is enclosed.

Fencing:

Construction cost per foot of high-tensile electrified five-wire fence: $1.24

- Construction cost per mile: $1.24 x 5,280 ft. = $4,699.20 (rounded up to $4,700)
- If the 1-mile fence encloses 40 acres, construction cost = $117.50/acre.
- This fence has a 25-year lifetime, so $117.50/25 = $4.70/acre/year fence construction cost

Annual maintenance and ownership cost of high-tensile electrified five-wire fence: $0.12/foot/year (1)

- Annual maintenance cost per mile: $0.12/ft. x 5,280 ft. = $633.60
- Spread over 40 acres: $633.60/mile/year / 40 acres = $16/acre/year fence maintenance cost

Cost for temporary divider fence for managed grazing: $0.20/ft. (1)

- Cost for ½ mile of temporary fence: $0.20/ft. x 2,640 ft. = $528
- Four-year lifespan, so $528/4 = $132/year
- Spread over 40 acres: $3.30/acre/year for temporary fencing to do managed grazing

continued on next page …

Fencing & Watering Costs, continued (pg. 2)

Watering:

Cost to run 1 mile of 1-1/4" irrigation plastic pipe with fittings and a 100-gallon tank: $3,000 (2)

Spread over 40 acres: $75/acre

Estimated 10-year lifespan, so $7.50/acre/year for watering system

A couple of things to note:

- This is for an above-ground system and the cost figure does not include the labor costs to lay the pipe in spring and remove it in fall.
- Thoughtful layout of paddocks and configuration of the watering system can reduce costs; the system may require significantly less than 1 mile of pipe.

References:

(1) **Estimated Costs for Livestock Fencing**. Updated December 2012. Ralph Mayer and Tom Olsen; revised by William Edwards and Andy Chamra. Iowa State University Extension and Outreach. File B1-75. www.extension.iastate.edu/agdm/livestock/html/b1-75.html (accessed 8/20/13).

(2) **The ABCs of Livestock Watering Systems**. 2006. Ben Bartlett. Midwest Plan Service, Iowa State University. www.extension.org/mediawiki/files/d/d2/9_Watering.pdf (accessed 8/20/13).

Grazing Income

Income from grazing varies widely depending on the productivity of the land, the condition of the pasture, and the grazing season. This example draws from two specific sample leases from south-central Wisconsin (1,2). The dollar figures used fall within ranges reported for custom grazing of cattle in Wisconsin and Iowa (3).

Assumptions for this example:

- The $/head/day amount includes the cost of the land lease plus the grazing management. In other words, in this example a landowner does custom grazing of another person's cattle.
- The stocking rate is a season-long average. Some graziers stock at a higher rate in the spring and reduce the rate as forage production declines in the fall. Drought results in earlier and larger reduction in the stocking rate.
- Rotational grazing is used
- Pasture is an upland grass and clover mixture with no fertilizer applied.

Stocking rate permitted (1) = 0.625 AU/acre (AU=Animal Unit = 1000 lbs. of cow)

Contract for custom-grazing dairy heifers (2):

- 230 animals, average weight of 600 lbs. = 138,000 lbs. = 138 AU
- 138 AU / 0.625 AU/acre stocking rate = 220 acres
- Contract grazing rate: $1.37/animal/day (1) x 230 animals = $315.10/animal/day
- Days of grazing: approximately 180 days (mid-April through mid-October) (2)
- Total payment due under contract: $315.10/day x 180 days = $56,718
- Payment per acre: $56,718/220 acres = $258/acre (round: $260/acre)

Note: The $260/acre is a gross income figure. The landowner doing the custom grazing has costs for labor and management time, perimeter fence maintenance, a watering system, mineral supplements, and fencing supplies for temporary fence.

References:

(1) **Contract for grazing on 320 acres, livestock managed by livestock owner**. 2013. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/sample_contracts_leases.html

(2) **Contract for custom grazing of dairy heifers, livestock managed by landowner**. 2013. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/sample_contracts_leases.html

(3) **Rates Charged for Contract Grazing Arrangements.** 2013. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/CG_Rates_final_0313.pdf

Perennial Forage			
	- **Column**	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Improved soil structure through having living roots in the ground year-round. Less soil erosion and less water runoff from a forage crop or well-managed pasture than from a grain crop Reduces weed pressure in the next cash crop Reduces insect and disease pressure in the next cash crop	Loss of net income from cash grain crop: $230/acre/year. *(See Corn & Soybean Profitability text box in the Crop Rotation section)* Cost to build perimeter fence around a 40-acre pasture: $4,700 for a 25-year fence; $4.70/acre/year *(See Fencing & Watering Costs text box)* Annual maintenance cost for high-tensile electrified wire perimeter fence: $16/acre *(See Fencing & Watering Costs text box)* Cost of temporary, movable fence for managed grazing: $3.30/acre/year *(See Fencing & Watering Costs text box)* 1-mile watering system:	Grazing land lease of $50/acre/year (lease only; not counting potential additional income from labor and management of grazing system)(6) Grazing land plus grazier services (labor and management for cattle herd on pasture): $230/acre/year **gross** income *(see Grazing Income text box)* Alfalfa hay production, net income: $228/acre/year (7) Plow-down value of alfalfa in providing nitrogen to next cash crop: $96/acre *(See Alfalfa Nitrogen Credit text box)* Plow-down value of alfalfa in providing nitrogen to the second-year cash crop: $30/acre *(See Alfalfa Nitrogen Credit text box)*	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by number of acres devoted to the practice: Multiply by a time frame (5 years? 10 years?) Total value over time:

The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.	$7.50/acre/year *(See Fencing & Watering Costs text box)* Cost of land ownership: $27/acre/year (includes interest, taxes, depreciation on facilities) (5)	$8.60/acre/year gain in fertilizer value of soil by saving 4.1 tons/acre/year from soil erosion; cumulative over years *(See Value of Saving Soil text box in the Crop Rotation section)* Benefit to society: approximately $20/acre/year gain in water quality value of soil by saving 4.1 tons/acre/year of soil from erosion *(See Value of Saving Soil text box in the Crop Rotation section)*	

References:

(1) **Organic Matter Management**. In The Soil Management Series. Revised 2008. Ann Lewandowski. http://www.extension.umn.edu/distribution/cropsystems/components/7402_02.html (accessed 6/11/13).

(2) **Rotation**. 2010. Kristine Moncada and Craig Sheaffer. In *Organic Risk Management*. http://www.organicriskmanagement.umn.edu/rotation2.html (accessed 8/20/13).

(3) **The Basics of Contract Grazing**. 2013. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/CG_Basics_final_0313.pdf (accessed 8/20/13).

(4) **Pasture Rental and Lease Agreements**. 2013. Jim Paulson and Richard Cates. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/CG_ContractLeases_final_0313.pdf (accessed 8/20/13).

(5) **Pasture Rental Agreements for Your Farm**. December 2011. North Central Farm Management Extension Committee. http://greenlandsbluewaters.net/Perennial_Forage/NCFMEC-03%20Pasture%20lease.pdf (accessed 8/20/13).

(6) **Contract for grazing on 320 acres, livestock managed by livestock owner**. 2013. Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/sample_contracts_leases.html (accessed 8/20/13).

(7) **What does it take to earn a living on the farm?** April, 2013. Gary Hachfeld, University of Minnesota Extension. http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_440374.pdf (accessed 8/06/13).

Further Resources:

Contract Grazing. 2013. Green Lands Blue Waters, Midwest Perennial Forage Working Group. http://greenlandsbluewaters.net/Perennial_Forage/contract.html (accessed 6/11/13). *Series of four fact sheets: Basics of Contract Grazing, Evaluating Land Suitability for Grazing Cattle, Pasture and Rental Lease Agreements, and Rates Charged for Contract Grazing Agreements.*

Forages. 2010. Craig Sheaffer. In *Organic Risk Management*. Editors: Kristine Moncada and Craig Sheaffer. University of Minnesota.
www.organicriskmanagement.umn.edu/forages12.html
This online manual is intended as a guide for organic and transitioning producers in the Upper Midwest. The Forages section includes a lot of good forage crop production information that is useful for non-organic farmers as well.

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 discusses strategies that can be implemented before a drought starts that could make life easier for a rancher when the eventual drought conditions do begin.

Perennial Pastures & Hayfields: What's in them?

Grasses	Legumes	Forbs
Perennial grasses form dense mats of fibrous roots that hold soil in place. Grasses for pasture and hay are generally divided into "cool-season" grasses, which have their main growth in the spring and fall; and "warm-season" grasses, which grow well in the heat of summer. In northern states, cool-season grasses are what you most commonly see in pastures and hayfields.	Legumes are plants related to beans and peas. They have a close relationship with a particular group of bacteria that live in the soil, called *Rhizobia*. *Rhizobia* "infect" legume roots where they collect nitrogen that the plants take in from the atmosphere, which is about 70% nitrogen gas. The bacteria transform this atmospheric nitrogen into a form useable by plants. Well-managed legume crops reduce the need for purchased synthetic nitrogen fertilizer, which is produced using fossil fuels.	Forbs are broad-leaved plants that are neither grasses nor legumes. Most of the plants that you recognize as weeds in your garden are forbs. Some forbs are weeds in pasture, and may be harmful to livestock. Some forbs are planted intentionally in pastures to provide variety in the livestock diet. Certain types of forbs have other beneficial effects such as long and fleshy roots that can loosen compacted soil and "scavenge" water and nutrients from deep in the soil.
Common types of cool-season hay & pasture grasses: Timothy, smooth bromegrass, orchardgrass, quackgrass, fescues, ryegrasses	**Most common hay & pasture legumes:** Alfalfa , red clover, white clover, birdsfoot trefoil	**Common planted forbs for pasture:** Turnip, chicory
Common types of warm-season grasses in the Midwest: Switchgrass, Big Bluestem, Indiangrass	**Less common hay & pasture legumes:** Kura clover, sainfoin, crownvetch, alsike clover	**Common pasture weeds that are forbs:** Canada thistle, goldenrod, curly dock, wild carrot

Reference:

Evaluating Land Suitability for Grazing Cattle. 2013. Midwest Perennial Forage Working Group, Green Lands Blue Waters. http://greenlandsbluewaters.net/Perennial_Forage/CG_Evaluating%20Land_final_0313.pdf

Pollinator & Beneficial Insect Habitat

One of the biggest stories in the agricultural press during the past several years has been the decline of domesticated honey bee populations all over the United States. Wild bee populations are also in decline due to loss of habitat, and this poses risks for agricultural crops that depend on bees for pollination. Insect pollination results in $26.9 billion in crop value per year. (1; *see Pollinator & Beneficial Insect Services text box*).

A key strategy to counter declines in pollinators is to plant and maintain habitats that promote and protect them by providing nectar and pollen, shelter, and protection from agricultural chemicals (2). Pollinator habitats can attract domestic honeybees, but also wild bees and other wild beneficial insect species. These beneficial species include many different wasps, beetles, lacewings, predatory mites, and more. Beneficial insects prey upon the kinds of insects that damage crops, so keeping them around can help reduce pesticide applications. Wild beneficial insects protect an estimated $4.5 billion per year in crop value by reducing insect pest damage (3).

Habitat Costs

These calculations are based on research on prairie strips within cropped fields (the STRIPS project) at the Neal Smith National Wildlife Refuge near Prairie City, IA.

Average cost of establishment of habitat:

- Site preparation including tillage and herbicide application: $86/acre
- Seeding including seed purchase, planting, and packing soil: $218/acre
- Mowing three times in first year: $90/acre

Total establishment cost: $394/acre (round up to $400/acre)

Establishment cost spread over 15-year lifetime = $400 per acre/15 years = $27/acre/year

Annual management and maintenance costs:

- Management average = 2% of establishment cost: $8/acre/year
- Mowing once/year = $30/acre/year
- Baling once/year = $11/acre/year

Total annual management+maintenance = $49/acre/year (round up to $50/acre/year)

Reference:

The Cost of Prairie Conservation Strips. August 2013. Leopold Center for Sustainable Agriculture, Iowa State University. www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2013-08-cost-prairie-conservation-strips.pdf (accessed 8/21/13).

Pollinator habitat is recognized as critically important by the USDA, and programs are available that offer cost-share for habitat establishment as well as annual contract payments (4). Privately funded cost-sharing and contracts are also available in some areas (5).

Pollinator and beneficial insect habitats can sometimes use marginal or poor cropland. In those cases, the loss of income from corn or soybeans will be less than it would be on prime cropland. There can be benefits to having pollinator/beneficial insect habitat right within prime cropland areas, however. Having beneficial insects living close to crops can reduce damage from insect pests. If the crop is dependent on insect pollination, it makes sense to have pollinators nearby. There are also potential soil and water quality benefits. Research in Iowa shows that strategically placing narrow strips of native prairie species within crop fields, on as little as 10% of the crop field acreage, can reduce sediment movement by 95% and water runoff by 60%. The strips, which provide prime habitat for pollinators and other beneficial insects, also provide greater soil and water conservation benefits than expected from the size of the strips (6).

If pollinator/beneficial insect habitat is something you want to see on your land in the future, then you can work pollinator habitat acreage into your farm transition plan. Federal, state, or private programs can support the cost of habitat creation and offset the loss of crop income from those acres. Rental agreements, leases, or sale terms should specify the boundaries of any established habitat planting and forbid damage to that area. See “Considerations for Landowners” in the Agroforestry section for more ideas for the farm transition plan. The points to consider are quite similar for agroforestry and habitat plantings.

Pollinator/Beneficial Insect Habitat			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Pollinators are critical to productivity of many fruit, vegetable, seed, and nut crops Beneficial insects prey on other harmful insects, reducing crop damage Possible reduced insecticide application to crops Pollinator/beneficial insect habitat contributes to species diversity on the farm; attracts birds and other wildlife Reduced soil erosion and water runoff from habitat strips strategically located on 10% of crop fields.	Establishment cost spread over 15 years: $27/acre of habitat/year *(See Habitat Costs text box)* Management and maintenance cost for habitat: $50/acre/year *(See Habitat Costs text box)* Loss of net income from cash crop on the pollinator habitat acres: $230/acre/year. *(See Cash Grain Profitability Calculation text box in Crop Rotation section).* Reduce this number if planting on less-productive acres. $30/acre/year cost for the acreage of the habitat, for extra time and hassle in field operations (tillage, spraying, and harvesting) to maneuver around the area. (7)	Full funding for habitat establishment through public or private programs (5,6) $150/acre/year contract payment for acres in pollinator habitat (5) Benefit to society: $29/acre/year from pollination services. This applies to **total farm acres**, not just acres in pollinator habitat. *(See Pollinator & Beneficial Insect Services text box)* $5/acre/year in crop protection services from beneficial insects. This applies to **total farm acres**, not just acres in pollinator habitat. *(See Pollinator & Beneficial Insect Services text box)* $8.20/acre/year gain in fertilizer value of soil by saving 95% of 4.1 tons/acre/year from soil erosion if	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.		habitat is on 10% of cropland acres. This amount applies to **total farm acres**. *(See Value of Saving Soil text box in the Crop Rotation section).* Benefit to society: approximately $19/acre/year gain in water quality value of soil by saving 95% of 4.1 tons/acre/year of soil from erosion if habitat is on 10% of cropland acres. This amount applies to **total farm acres**. *(See Value of Saving Soil text box in the Crop Rotation section).*	

References:

(1) **Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregrate Data for the Period 1992-2009.** May 2012. Nicholas Calderone. PLoS-ONE 7(5): e37235. http://dx.doi.org/10.1371/journal.pone.0037235

(2) Pollinators. Conservation Marketplace Midwest.
http://conservationmarketplace.org/case-studies/pollinators/ (accessed 8/21/13).

(3) **The Economic Value of Ecological Services Provided by Insects.** 2006. John Losey and Mace Vaughan. BioScience 56(4):311-323. http://dx.doi.org/10.1641/0006-3568(2006)56[311:TEVOES]2.0.CO;2

(4) **Using Farm Bill Programs for Pollinator Conservation, Technical Note No. 78. August 2008. Mace Vaughan and Mark Skinner.** The Xerces Society, USDA-NRCS, and San Francisco State University.
www.xerces.org/wp-content/uploads/2009/04/using-farmbill-programs-for-pollinator-conservation.pdf (accessed 8/21/13).

(5) **Pollinator Habitat Project with General Mills**. April 2012. Linda Meschke. Conservation Marketplace Midwest.
www.gberba.org/Tech%20Page/TechHandouts2012/Technical%20-%20Handout%20-%202012%20-%205%20-%20CMM%20-%20Pollinator%20Habitat%20Project%20with%20General%20Mills(May12).pdf (accessed 8/21/13).

(6) **A Landowner's Guide to Prairie Conservation Strips.** The Leopold Center for Sustainable Agriculture, Iowa State University.
www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2013-08-landowners-guide-prairie-conservation-strips.pdf (accessed 8/21/13).

(7) **Economic and Environmental Costs and Benefits of Living Snow Fences: Safety, Mobility, and Transportation Authority Benefits, Farmer Costs, and Carbon Impacts**. February 2012. Gary Wyatt, University of Minnesota Extension; Minnesota Department of Transportation Research Services.
www.lrrb.org/media/reports/201203.pdf (accessed 8/12/13).

Further Resources:

Alternative Pollinators: Native Bees. 2010. Eric Mader, Mace Vaughan, Matthew Shepherd and Scott Hoffman Black. The Xerces Society for Invertebrate Conservation and National Center for Appropriate Technology.
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.

Pollinator Conservation. Center for Urban Ecology and Sustainability, Department of Entomology, University of Minnesota.
www.entomology.umn.edu/cues/pollinators/plants.html (accessed 8/26/13).

Pollinator & Beneficial Insect Services

Analysis of pollinator services based on 2009 crop yields shows that in the United States, domestic and wild bees and other insect pollinators were responsible for:

- $15.1 billion per year in crop value from crops directly dependent on insect pollination (mainly fruits, vegetables, and nuts)
- $11.8 billion per year in crop value from crops indirectly dependent on insect pollination (forage crops and other crops planted from seed that is produced via insect pollination)

Total annual value of insect pollination services to United States agriculture: $26.9 billion (1)

- Total acres in farms in United States in 2009: 919.8 million acres (2)
- Value of pollination services per acre of farmland in the U.S.:
- $26.9 billion / 919.8 million acres = $29.25/acre of farmland; rounded down to $29/acre

Value of crop protection services from beneficial insects: $4.5 billion per year (3)

- Value of crop protection services per acre of farmland in the U.S.:
- $4.5 billion / 919.8 million acres = $4.89/acre of farmland; rounded up to $5/acre

continued on next page …

Pollinator & Beneficial Insect Services, continued (pg. 2)

A couple of things to note:

- These values for pollinator services and for crop protection services are calculated on total United States farm acreage, so you should multiple the $/acre figure by the total number of acres of your farm to calculate your farm's share of the total benefit to the U.S. farm economy from pollinator services.

- Actual benefits to the farm from pollinator services or crop protection services will depend on amount of pollinator habitat established and where it lies in relation to crop fields (4).

References:

(1) **Insect Pollinated Crops, Insect Pollinators and US Agriculture: Trend Analysis of Aggregrate Data for the Period 1992-2009.** May 2012. Nicholas Calderone. PLoS-ONE. 7(5):e37235. http://dx.doi.org/10.1371/journal.pone.0037235 .

(2) **Farms, Land in Farms, and Livestock Operations 2009 Summary**. February 2010. National Agricultural Statistics Service (NASS), USDA. http://usda01.library.cornell.edu/usda/nass/FarmLandIn//2000s/2009/FarmLandIn-02-12-2009.pdf (accessed 8/21/13).

(3) **The Economic Value of Ecological Services Provided by Insects**. 2006. John Losey and Mace Vaughan. BioScience 56(4):311-323. http://dx.doi.org/10.1641/0006-3568(2006)56[311:TEVOES]2.0.CO;2

(4) **Alternative Pollinators: Native Bees. 2010.** Eric Mader, Mace Vaughan, Matthew Shepherd and Scott Hoffman Black. The Xerces Society for Invertebrate Conservation and National Center for Appropriate Technology. https://attra.ncat.org/attra-pub/summaries/summary.php?pub=75

Wildlife Habitat

Many of the principles for establishing and managing habitats for beneficial insects also apply to establishment of wildlife habitat in general. Establishing and maintaining habitat can be purely for aesthetic and conservation purposes, or it can be done with an eye toward encouraging the presence of game species. Fee hunting or hunting leases can be a significant source of farm income if the farm acreage is large enough and productive enough. Tennessee reports an average hunting lease size of 663 acres. (1) It is not necessary for all or even most of the farm's acreage to be in habitat plantings in order for it to be a good location for hunting game species. According to the Mid-America Hunting Association, "… once there is food then there [are] good deer to be found. The deer will make use of whatever cover that is near their dinner table (2)."

Many wildlife species thrive in edges between their nesting and shelter areas and tilled crop areas, so arranging a farm to have several relatively smaller habitat plantings can be as good as or better than a large single block of habitat in terms of species diversity and productivity (3,4).

Habitat plantings might be permanent native grass and prairie plant species to provide shelter, nesting areas, food and space for whatever species you want to encourage. Game examples include quail, pheasants, grouse, ducks, geese or deer. Non-game birds as well as mammals, reptiles and amphibians will also be

Profitability of a Hunting Lease

This example uses the figures from the Wildlife Habitat table. References are not repeated here; refer to the table and other text boxes for references.

Sample calculation for 633-acre farm (average hunting lease size in Tennessee), assuming that wildlife habitat is strategically placed to reduce soil erosion on 10% of those acres (63 acres).

Annual gains due to wildlife habitat:

- Annual hunting lease: $30/acre x 633 acres = $18,990
- Annual gain in soil fertility on all acres by reducing soil erosion: $8.20/acre x 633 acres = $5,191

Total annual gain = $24,181

Annual costs for wildlife habitat:

- Annual amount of total habitat establishment cost: $27/acre x 63 acres = $1,701
- Annual maintenance cost for habitat: $50/acre x 63 acres = $3,150
- "Hassle cost" of maneuvering farm equipment around habitat: $30/acre x 63 acres = $1,890
- Lost cash crop income on habitat acres: $230/acre x 63 acres = $10,868

Total annual costs = $17,609

Net annual gain = $24,181 - $17,609 = $6,572

attracted to habitat areas. Attracting wild game and non-game species to agricultural property might also involve planting food plots of annual crops, or leaving unharvested strips of cropland for winter feed (5).

The table below does not include any mention of cost-sharing or annual payments from public or private programs. Land in wildlife habitat may certainly be eligible for such programs, especially if the habitat placement is done to maximize soil and water conservation benefits. Some (but not all) of those programs may restrict the landowner's ability to also charge a fee for hunting on the property. This table shows costs and benefits of habitat with no program support, with a hunting lease as an income source and leaving you to place your own value on benefits to non-game wildlife species.

If having wildlife habitat is part of your vision for the future of your land, then your farm transition plan should include:

- A plan for who will do the work of habitat establishment and maintenance. A beginning farmer could put "sweat equity" into the establishment work and receive a credit on the land lease or sale price for that effort.
- A plan for fair division of costs and benefits from the wildlife habitat. There could be a wide variety of arrangements. For example, if retiring farmers or landowners want to retain the hunting rights for themselves and family members, then the value of those hunting rights should be included in the financial planning and the farm operator should receive a credit to make up for hunting lease fees he or she won't be able to charge.
- Terms of the lease or sale should specify the boundaries of the habitat areas and prohibit damage to or removal of the habitat.

Even if you ultimately choose not to enroll habitat acres in a conservation program, your local NRCS office could still be helpful in the process by providing maps of your farm and technical advice. Find your local NRCS service center:
http://offices.sc.egov.usda.gov/locator/app?agency=nrcs

Wildlife Habitat			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Increase species diversity of farm by as much as 380% (3) Nesting habitat for songbirds Food source for migrating birds and insects Pollinator and beneficial insect habitat **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Establishment cost spread over 15 years: $27/acre of habitat/year *(See Habitat Costs text box in Pollinator Habitat section)* Management and maintenance cost for habitat: $50/acre of habitat/year *(See Habitat Costs text box in Pollinator Habitat section)* Loss of net income from cash crop on the wildlife habitat acres: $230/acre/year. *(See Cash Grain Profitability Calculation text box in Crop Rotation section).* Reduce this number if planting on less-productive acres. $30/acre/year cost for the acreage of the habitat, for extra time and hassle in field operations (tillage, spraying, and harvesting) to maneuver around the area. (7)	$30/acre/year on **total farm acres**; hunting lease price for exclusive right to hunt entire farm. (Range $10-$60 per acre) (6) $8.20/acre/year gain in fertilizer value of soil by saving 95% of 4.1 tons/acre/year from soil erosion if habitat is on 10% of cropland acres. This amount applies to **total farm acres.** *(See Value of Saving Soil text box*; 3) Benefit to society: approximately $19/acre/year gain in water quality value of soil by saving 95% of 4.1 tons/acre/year of soil from erosion if habitat is on 10% of cropland acres. This amount applies to **total farm acres**. (*See Value of Saving Soil text box*; 3).	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **Earning Additional Income Through Hunt Leases on Private Land**. Craig Harper, Charles Dixon, Paul Jakus, and Alan Barefield. University of Tennessee Agricultural Extension Service, publication #PB1627. https://utextension.tennessee.edu/publications/Documents/PB1627.pdf (accessed 8/21/13).

(2) **Deer Hunting on Private Land in Kansas, Iowa, and Missouri.** Mid-America Hunting Association. www.magba.com/deerhunting.html (accessed 8/21/13).

(3) **A Landowner's Guide to Prairie Conservation Strips**. The Leopold Center for Sustainable Agriculture, Iowa State University. www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2013-08-landowners-guide-prairie-conservation-strips.pdf (accessed 8/21/13).

(4) **Field Borders for Wildlife**. 2013. Virginia Department of Game and Inland Fisheries. www.dgif.virginia.gov/habitat/landowners/infosheets/field-borders.asp (accessed 8/21/13).

(5) **Enhancing Wildlife Habitat on Farmlands.** 2002. Marja H. Bakermans and Amanda D. Rodewald. The Ohio State University Extension, publication #W-14-2002. http://ohioline.osu.edu/w-fact/0014.html (accessed 8/21/13).

(6) **Prices for Leasing Hunting Property.** 2011. Discussion thread on Quality Deer Management Association Forum. www.qdma.com/forums/archive/index.php/t-42639.html (accessed 8/21/13).

(7) **Economic and Environmental Costs and Benefits of Living Snow Fences: Safety, Mobility, and Transportation Authority Benefits, Farmer Costs, and Carbon Impacts**. February 2012. Gary Wyatt, University of Minnesota Extension; Minnesota Department of Transportation Research Services. www.lrrb.org/media/reports/201203.pdf (accessed 8/12/13).

Further Resources:

Farmlands and Wildlife: Pennsylvania State University, College of Agricultural Sciences. http://pubs.cas.psu.edu/FreePubs/pdfs/agrs104.pdf
This manual emphasizes the importance of agriculture in maintaining habitat for wildlife. It is also intended 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, and water quality management are all mandatory for an organic farmer.

What makes a farm USDA Certified Organic, and thus qualifies the farmer to receive price premiums for farm products in the marketplace, is the use and documentation of production practices specified by the requirements of the USDA's National Organic Program (NOP) (1). Following NOP-specified practices, developing a record-keeping system to document all practices on the farm, paying certification fees, and undergoing an annual inspection by a certified inspector is how farmers achieve organic certification (2).

One of the most daunting barriers to organic cropping conversion is the three-year transition period usually required before the land can be certified. The transition period can be a difficult time for a producer to be profitable. She or he has to spend time creating an organic farm plan and interacting with the certifying agency. Converting farmland to an organic management system can cause unexpected challenges in the form of disease, insect, and weed pressure if chemical methods of controlling those are suddenly withdrawn. Eventually the system re-balances and those problems diminish, but that's why there is a three-year transition period: it takes some time to work out the system.

An organic farmer can't access the organic price premiums during the transition period, so for that period there may be lower yields but not yet the organic premium prices for the farm's products; although there are some niche markets such as non-GMO (non-genetically modified organisms) that farmers can sell to during the transition. Some farmers do a gradual transition; for instance, a field at a time to organic production (2). This strategy can reduce the risk of no or low whole-farm profits during the transition phase, but it comes with its own costs of maintaining buffer areas between the organic and conventional fields, and extra procedures during and after harvest to make sure that none of the conventional crop gets mixed in with the organic.

Size and potential sales volume of a future organic farm are also factors to consider. Financial record collection and analysis for organic farms in Minnesota shows that from 2006 to 2010, organic farms that could generate at least $100,000 per year in sales were generally more profitable than smaller organic farms, although there was much variation from year to year (3). Organic farms average about 33% fewer acres than conventional farms, and require more management time per acre and more kinds of equipment *(see Organic Costs text box)*. It's important in a farm transition plan to make sure that the future organic farm has the right size and production capacity to give the farmer a reasonable chance to make it work, both financially and in terms of time management (*see Organic Profits text box*).

If part of the legacy that you want for your land is to have it farmed organically, then it is important that your farm transition plan recognizes the particular challenges of organic agriculture. It is very difficult for an organic farmer to deal with an annual cash rent situation or a short-term lease, because of the large investment of money, labor, and management time they need to make the transition to certified organic production. Organic farmers typically need a lease term of at least five years, and even longer would be better. If the land is not already certified organic and must undergo the three-year transition period to organic, then the new farmer would greatly benefit from a stepped rent arrangement with lower payments during the transition period. In a sale arrangement, lower payments in the first few years would be beneficial for giving the farmer the "breathing room" needed to complete the three-year organic transition period and become profitable.

Organic Certification			
	- Column	**+ Column**	
Qualitative Benefits of the Practice	**Cost of Implementation and Potential Income Loss**	**Potential Income Gain and Reduced/Avoided Costs**	**Your Judgment: Value Per Acre of This Practice on Your Land**
Reduced pesticide (insecticide, herbicide, or fungicide) use Reduced synthetic nitrogen fertilizer use Manure use benefits of building soil organic matter Crop rotation benefits of reduced soil erosion and reduced water runoff Guarantees pasture access for dairy cattle Buffer strip requirements generate wildlife habitat **The numbers in this table are broad estimates, and you should adjust them for your farm's conditions.**	Organic certification net costs: $1.60/acre *(See Certification Costs text box)* Higher management time, complexity cost, and machinery ownership cost over conventional agriculture: $117/acre *(See Organic Costs text box)*	Average net return from established organic cropping system with four-year rotation: $470/acre/year (*See Organic Profits text box*) $8.60/acre/year gain in fertilizer value of soil by saving 4.1 tons/acre/year from soil erosion; cumulative over years (*See Value of Saving Soil text box in Crop Rotation section*) Benefit to society: approximately $20/acre/year gain in water quality value of soil by saving 4.1 tons/acre/year of soil from erosion (*See Value of Saving Soil text box in Crop Rotation section*) $15.70/acre/year of nitrogen, phosphorus, potassium, and sulfur for each 1% of soil organic matter; it takes about a decade of regular manure application to raise the SOM by 1%. *(See Value of Soil Organic Matter textbox in Soil Fertility Management section)*	Potential income gain and costs avoided: + Potential income loss and costs to pay: - Your judgment on value to your farm of qualitative benefits: + Value to society or environment: + Add up the total net value per acre per year: Multiply by a time frame (5 years? 10 years?) Total value over time:

References:

(1) **National Organic Program (NOP). USDA Agricultural Marketing Service.** www.ams.usda.gov/

(2) **Minnesota Guide to Organic Certification.** 2007. Jim Riddle and Lisa Gulbranson. http://conservancy.umn.edu/bitstream/51829/1/MN_Guide_to_Organic_Certification.pdf (accessed 8/27/13).

(3) **2010 Organic Farm Performance in Minnesota.** 2011. Dale Nordquist and Meg Moynihan. Minnesota Department of Agriculture. www.mda.state.mn.us/~/media/Files/food/organicgrowing/organicperformance2010.ashx (accessed 8/23/13).

Further Resources:

Midwest Organic and Sustainable Education Service (MOSES).
www.mosesorganic.org/
Collection of fact sheets on organic transition and certification process, sample forms and budgets, resource directory, online organic classified ads, online bookstore with many titles relevant to organic and sustainable farming.

Organic Agriculture. Minnesota Department of Agriculture.
www.mda.state.mn.us/food/organic.aspx
Information and tools for Minnesota organic farmers, some of which would be useful to farmers in other states; including cost-share application forms, lists of accredited certifying agencies, Minnesota organic farm directory, scholarships, financial reporting, Driftwatch registry, and specific items like "No Spray" signs.

Organic Agriculture Program. Iowa State University Extension.
http://extension.agron.iastate.edu/organicag/
Iowa field day and conference information; general information on certification and production; research reports; National Organic Program standards; information on suppliers of organic farm inputs and buyers of organic products.

Organic Farming. Appropriate Technology Transfer for Rural Areas, National Center for Appropriate Technology. https://attra.ncat.org/organic.html
Collection of informational fact sheets on organic field crop, livestock, and horticultural crop production; certification and marketing; the transition to organic; and explanation of National Organic Program guidelines.

Organic Risk Management. 2010. Editors: Kristine M. Moncada and Craig C. Sheaffer. www.organicriskmanagement.umn.edu/ (accessed 8/27/13)
Extensive research-based guide to organic crop production and management, including chapters on crop rotation; soil health and fertility; weed biology and management; transitioning to an organic system; organic corn, soybean, small grain, and forage production; cover crops; and alternative crops. Useful for non-organic farmers, too; there is a lot of good basic agronomic information in this resource.

Certification Costs

Certification costs involve several different types of fees: application fee, annual renewal fee, assessment on annual production or sales, and inspection fee (1). Since some of the cost depends on gross annual production or sales, costs per acre can vary greatly depending on the value of the crop grown.

This example uses certification cost figures from the Minnesota Crop Improvement Association (2); but note that certifying agencies vary in their charges. The example assumes a U.S. Midwest (MN, WI, or IA) organic farm size average of 190 acres and gross annual sales average of $129,000 (3).

Base certification fee:	$325	
Annual membership:	$50	
Inspection fee:	$150	(assuming 2 hours at $75/hour)
% of gross sales:	$645	(0.5% of $129,000 in sales)
TOTAL:	$1,170	total certification cost for the farm.

The USDA offers 75% reimbursement of organic certification costs once a farm is certified (1).

- $1,170 x 0.25 = $292.50 certification cost after 75% reimbursement
- $292.50 total certification cost / 190 acres = $1.53/acre (round up to $1.60/acre)

References:

(1) FAQ: Becoming a Certified Operation. 2012. USDA, National Organic Program. www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&navID=NOPFAQsHowCertified&topNav=&leftNav=NationalOrganicProgram&page=NOPFAQsHowCertified&description=FAQ:%20%20Becoming%20a%20Certified%20Operation&acct=nopgeninfo

(2) Organic Fee Schedule and Scale of Sanctions. 2011. Minnesota Crop Improvement Association. www.mncia.org/assets/documents/pub/organic/Organic_Fee_Schedule_and_Scale_of_Sanctions.pdf (accessed 8/23/13).

(3) **Farms, Land Use, and Sales of Organically Produced Commodities on Certified and Exempt Organic Farms: 2008**. In *2008 Organic Producers Survey*. USDA National Agricultural Statistics Service. www.agcensus.usda.gov/Publications/2007/Online_Highlights/Organics/organics_1_01.pdf (accessed 8/23/13).

Organic Costs

Certified organic agricultural production systems are more complex than conventional corn and soybean production. Organic farmers need to have an organic farm plan that documents the fertilizers, manure, or any other substances applied to every field, every year. They need to document seed lots planted, keep logs of every operation done to every field, and document harvested crops with enough detail that every crop can be traced back to the field it came from (1). Organic farmers need to manage long rotations; and planning good rotations is a very complex task that requires time and thought (2). Because they are growing more types of crops, organic farmers need more types of planting and harvesting equipment. Because they are using machinery instead of herbicides for weed control, they need more types of tillage, cultivation, and other weed-control equipment. Reliance on machinery for weed control requires careful timing of field operations, and sometimes that's not possible due to weather. As a result, another potential cost is yield reduction due to weeds getting ahead of the crop (3). Organic farms also tend to involve livestock to a greater degree than conventional cash grain farms, which adds to the complexity of managing the whole system.

These background costs of machinery ownership and maintenance, as well as management of complex systems, are difficult to capture in an enterprise budget. Enterprise budgets for crop production generally document only the costs of field operations (4). Analysis of long-term organic and conventional crop production systems in Minnesota shows that the requirement for more types of machinery in organic systems can limit the size of organic farms (3).

The following example is a rough estimate of the amount of cost per acre that applies to organic farms as a result of the factors that tend to restrict the size of organic farms. The total cost of complexity, machinery ownership, and background management on organic farms is not well documented, so as a stand-in for those costs, this example uses Agricultural Census data on the average size of organic farms and of all farms (5,6). A key assumption is that the *total* time spent on managing the average farm is the same, whether a farm is organic or conventional. With that assumption, the difference in average farm size can be used to estimate the extra costs of being organic.

continued on next page …

Organic Costs, continued (pg. 2)

- Average size of all farms in MN, WI, and IA; 2008 data: 287 acres
- Average annual return to management from conventional corn & soybean production: $230/acre (7)
- Valued at a management cost of $40/hour *(*see note, below):* $230/acre / $40/hour = 5.75 hours/acre of management time for conventional corn and soybean production.
- 5.75 hours/acre x 287 acres average farm size = 1,650.25 hours per farm (round to 1,650 hours)

**Note: The $40/hour figure for management is an arbitrary figure chosen for this calculation, and the hours spent per acre and per farm are estimates that include not only actual management time, but also costs relating to yield loss due to untimely field operations, equipment ownership costs, and other unspecified costs associated with complexity of the organic farming system.*

Now, working the calculation in reverse:

- Average size of organic farms in MN, WI, and IA; 2008 data: 190 acres
- 1,650 hours/farm / 190 acres average organic farm size = 8.68 hours/acre of management time for an organic farm
- 8.68 hours/acre x $40/hour = $347.20/acre management charge for organic farms.
- $347.20/acre organic - $230/acre conventional corn and soybean = $117/acre higher background management + complexity + machinery ownership cost for organic farms.

This calculation returns very similar results if nationwide figures are used. Nationwide average size of all farms is 418 acres, and nationwide average size of organic farms is 280 acres. Difference in management cost per acre using national figures = $114/acre higher for organic farms.

Delbridge et al., using financial data from Minnesota organic farms, calculated that machinery ownership costs averaged about $3.30/acre higher for organic farms than for conventional corn and soybean farms (3).

continued on next page …

Organic Costs, continued (pg. 3)

Thus, the cost of background management + complexity on organic farms:
$117/acre - $3.30/acre machinery ownership cost = $113.70/acre

References:

(1) **Minnesota Guide to Organic Certification.** 2007. Jim Riddle and Lisa Gulbranson. http://conservancy.umn.edu/bitstream/51829/1/MN_Guide_to_Organic_Certification.pdf (accessed 8/27/13).

(2) **Crop Rotation on Organic Farms: A Planning Manual**. 2009. Editors: Charles L. Mohler and Sue Ellen Johnson. Natural Resource, Agriculture and Engineering Service; published by Sustainable Agriculture Research and Education (SARE). www.sare.org/Learning-Center/Books/Crop-Rotation-on-Organic-Farms (accessed 8/25/13).

(3) **A whole-farm profitability analysis of organic and conventional cropping**. 2013. Timothy A. Delbridge, Carmen Fernholz, Robert P. King, William Lazarus. *Agricultural Systems*. http://dx.doi.org/10.1016/j.agsy.2013.07.007

(4) **Organic Crop Production Enterprise Budgets.** July 2011. Craig Chase, Kathleen Delate, Ann Johanns. Iowa State University. www.extension.iastate.edu/agdm/crops/html/a1-18.html (accessed 8/23/13).

(5) **Farms, Land Use, and Sales of Organically Produced Commodities on Certified and Exempt Organic Farms: 2008**. In 2008 Organic Producers Survey, USDA National Agricultural Statistics Service. www.agcensus.usda.gov/Publications/2007/Online_Highlights/Organics/organics_1_01.pdf (accessed 8/23/13).

(6) **Farms, Land in Farms, and Livestock Operations 2008 Summary**. February 2009. USDA National Agricultural Statistics Service. http://usda01.library.cornell.edu/usda/nass/FarmLandIn//2000s/2009/FarmLandIn-02-12-2009.pdf (accessed 8/23/13).

(7) **What does it take to earn a living on the farm?** April, 2013. Gary Hachfeld, University of Minnesota Extension. http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_440374.pdf (accessed 8/06/13)

Organic Profits

This example uses organic crop enterprise budgets from Iowa State University Extension, and assumes a four-year crop rotation: corn – soybean – oats + alfalfa – alfalfa. These budgets assume a 17% yield reduction for organic corn and a 20% yield reduction for organic soybean, compared to conventional crop yields (1).

The amount of yield reduction due to organic production is hotly debated. Research at the University of Minnesota from 1993 to 1999 with land that had completed the three-year transition period showed yield reductions of 7% for corn and 21% for soybean compared to a high-input conventional system (2). Depending on the length of time the organic system has been in place, the management skill of the farmer, weather conditions during the growing season, and other factors; organic crop yields may sometimes equal or even outpace conventional yields.

University of Minnesota researchers looked at 22 studies from across the United States and found that organic corn yields ranged from 59% to 108% of conventional corn yields, with a median of 86%. Organic soybean yields ranged from 50% to 113% of conventional soybean yields, with a median of 92% (3). The Iowa budgets used here, therefore, are based on fairly middle-of-the-road estimates for an organic farm that has finished the three-year transition period.

Net returns to management (costs for labor, equipment operations, seed, fertilizer, etc. to plant, tend, harvest, and dry the crop have been deducted; as well as the cost of land rent per acre):

Organic Corn:	$988/acre
Organic Soybean:	$478/acre
Organic Oat + Alfalfa:	$228/acre
Alfalfa:	$191/acre

four-year rotation average: $471.25/acre (round to $470/acre)

continued on next page …

Organic Profits, continued (pg. 2)

Note: It may look very tempting to just raise organic corn and soybeans for those high per-acre returns, and not do the 4-year rotation. However, a two-year corn and soybean rotation is not a certifiable organic system. Longer rotations are required as part of an organic farm plan (4).

References:

(1) **Organic Crop Production Enterprise Budgets.** July 2011. Craig Chase, Kathleen Delate, Ann Johanns. Iowa State University. www.extension.iastate.edu/agdm/crops/html/a1-18.html (accessed 8/23/13).

(2) **Long-Term Effects of Crop Management: Yield.** April 2004. Results from the VICMS study at the Southwest Research and Outreach Center, Lamberton, Minnesota. Paul Porter, Dave Huggins, Catherine Perillo, Steve Quiring, and Kent Crookston. University of Minnesota. http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_236359.pdf

(3) **Productivity, economics, and soil quality in the Minnesota variable-input cropping systems trial.** 2013. Coulter, J. A., Delbridge, T. A., King, R. P., Allan, D. L., and Sheaffer, C. C. Online. Crop Management doi:10.1094/CM-2013-0429-03-RS. www.plantmanagementnetwork.org/pub/cm/symposium/organic/farm/variable/variable.pdf (accessed 8/27/13).

(4) **Minnesota Guide to Organic Certification.** 2007. Jim Riddle and Lisa Gulbranson. http://conservancy.umn.edu/bitstream/51829/1/MN_Guide_to_Organic_Certification.pdf (accessed 8/27/13).

Summary: Total Value of Conservation and Sustainable Agriculture Practices

Use this summary worksheet to calculate the total net value to your farm from all of the practices you intend to include in a farm transition plan. From the Cost/Benefit table for each practice, copy the following numbers into the corresponding columns below:

- The total net value of each practice per acre per year
- That total net value for each practice, multiplied by a time frame (5 or 10 years)

Then, add up the values for all of the practices you chose both on a per-acre per-year basis, and on a five- or ten-year basis, and enter those totals at the bottom of each column.

Value of Sustainable Practices Summary		
Practice	Net Value (Cost) per acre per year	Net Value (Cost) per acre over time frame selected, 5 or 10 years
Crop Rotation		
Manure Management		
Cover Crops		
Agroforestry		
Wetland Restoration		
Alternative & Specialty Crops		
Perennial Forage		
Pollinator & Beneficial Insect Habitat		
Wildlife Habitat		
Organic Certification		
TOTAL Net value of all practices:		

Farm Transitions Profiles

By Alex Baumhardt
Land Stewardship Project Communications Intern

Land Stewardship Project Farm Transition Profiles

During the summer of 2013, Land Stewardship Project Farm Beginnings journalism intern Alex Baumhardt interviewed several families in Minnesota and Wisconsin that were in various stages of farm transitions. The following five "Farm Transition Profiles" are the result of those interviews.

They range from the story of Mary Ellen Frame, a retired farmer and local leader in sustainable agriculture who has successfully passed her land onto Erin Johnson and Ben Doherty, to Craig Murphy, who is just starting to plan how he can find the right person to continue his organic farming legacy. These profiles make it clear that there is no one set way for making farming accessible to the next generation, and that often traditional financing tools aren't adequate—or at the least need to be modified. For example, Ryan Batalden and Caleb and Lauren Langworthy represent farmers who have found investors to give them a leg-up. Jon Peterson is hoping the conservation easement he has placed on his scenic farm will keep it affordable for the next generation.

The common thread connecting these profiles is that all parties involved—retiring farmers as well as new farmers—have given the transitioning process long, careful thought. Planning, flexibility and creativity are key elements of any transition plan. In the end, these profiles illustrate that no matter what the circumstances, successful transitions require help and support from a broad spectrum of community members.

As Ryan Batalden says, "Anyone who tells you that they got into farming without any help is lying — or they have a bad memory."

Land Stewardship Project Farm Transition Profile: A Return to the Community

Ryan Batalden grew up on farmland in southwest Minnesota that was given to his family during the late 1800s homesteading acts. When he returned to the community of Lamberton to become a fifth-generation Batalden farmer, his experience with land access was a far cry from that of his great-great grandfather's, his grandfather's, or even his father's.

"All of the other family members that wanted to farm were able to buy that land or buy land next to it, but historically where I'm at, it's just not where that's even possible," Batalden, 36, says.

As he says this, Batalden is standing on an 80-acre section of the 340 acres he rents, several miles from the very farm he grew up on. This 80-acre parcel was the first land Batalden was able to rent and it was his foot in the door when it came to getting started as an independent farmer. Batalden treats all of his land with a pride of ownership that supersedes his reality as a renter. He's established native pollinator habitat, uses cover crops to build the soil and is carving out a place in the community that he hopes will allow him to continue his family's farming legacy.

A Reverse Brain Drain

After graduating from high school in 1995, Batalden did what he says most kids that grow up in rural areas nowadays do—leave. "That's what I did because that's what you're supposed to do—get off the farm and go get a good job. We're taught to never come back," he says, adding that there was also the sense that there simply wasn't room for him on his family's home place. "There was never even any talk of me farming because I couldn't just jump in and farm some of their land, they wouldn't have enough income."

He received a bachelor's degree in communications at the University of Minnesota, got an office job in the Twin Cities and, when he was ready to "crawl out of his skin" for want of the outdoors, took off backpacking in Europe for several months. When he got back to the U.S., he helped his parents during fall harvest to save some money and get his bearings. He

knew he wanted to work outside and, as the season went on, he knew he wanted to be a farmer.

“I realized that I was as excited about Sunday evening as I was about Friday evening,” Batalden recalls. “I’d never had a job like that before.”

But it soon became clear that lack of access to land was going to be a problem, even for someone with a farming background and deep roots in the community. In 2003, Batalden went to an auction with his father and uncle to get an idea of what land in the area was going for. The land went for $3,200 an acre, and Batalden’s father and uncle told him it was too high a price to be buying land for.

“I’m sure that same piece would sell for $10,000 an acre now,” Batalden says.

He tried to buy land with a USDA Farm Service Agency (FSA) loan but found that such a loan cannot be used to buy land sold at auctions, which is the means by which most of the land in and around Lamberton was being sold. When Batalden did find a private sale he could apply the loan towards, he discovered that it would take six to 12 months for the loan to come through. The family he wanted to purchase the land from at the time couldn’t wait that long, especially as other offers on the land could come through faster.

“The only way I see the FSA loan program working is if you have someone that can buy land at an auction, sell it to you privately and wait that six to 12 months for your loan to come through,” Batalden says.

During summer breaks throughout college, Batalden had worked part-time at the University of Minnesota Southwest Research and Outreach Center in Lamberton. A few people at the center knew that Batalden was back and wanting to farm and they helped him get in touch with an absentee landowner who was interested in renting to a farmer who would take good care of the land. In 2012, Batalden renewed his lease on that original 80-acre plot for another 10 years.

The rental contract is set up through a “sharecropping” arrangement. That means that Batalden and the landowner share the expense of the fertilizer, and the young farmer covers everything else—seed, equipment, labor. At the end of the year, the landowner gets 40 percent of the crop value and Batalden receives the other 60 percent. Sharecropping was ideal for Batalden as a new farmer because he didn’t have to borrow money for cash rent. During a good year, Batalden’s landlord stands to receive a higher profit than if she had a simple cash-rent agreement with him. But in a bad year, she shares the risk with him.

A Good Steward's Competitive Advantage

Batalden's landlord is providing the young farmer this opportunity because he takes special care to treat the fields in an environmentally friendly manner. For example, Batalden is certified organic, which stands out in an area where chemical-intensive operations are often 10 times the size of his popcorn, soybean and wheat operation.

He wasn't the first Batalden to go organic. His parents switched to organic farming in the late 1990s without even telling the rest of the family. "They had 300 acres tillable ground, 50 acres of pasture, and that was just barely enough for them to live off of conventionally," Batalden says. This, along with the desire to wean their land off of destructive pesticides, prompted them to transition to the organic market where they could sell their crops at a higher price.

Batalden likes organics not only because of the higher premium price he receives for his crops, but because he feels he's giving back to the land that sustains his livelihood while building the soil for future farmers who may someday find Lamberton an attractive community to live in.

An Investment in the Future

Batalden's commitment to stewardship has opened up another door to farmland access. Five years ago, he got an e-mail about a private investment company called New Spirit Farmland Partnerships based out of Milwaukee, which focuses on connecting investors to early stage projects concerned with land stewardship and ethical farming. One thing the initiative does is to link socially-minded investors with sustainable farmers who need capital to purchase land.

"It just seemed way too pie-in-the-sky. I thought, there's no way this is going to work," Batalden recalls. "Nobody just calls you up and says, 'I want to spend a huge amount of money on you.' "

But one investor did just that. She bought 160 acres in the Lamberton area and in 2008 gave Batalden a 15-year, cash-rent lease. Then, in 2010, she bought another 100 acres to rent to Batalden. He pays a "very fair rent" to her (Batalden says he is charged less than what a landowner would probably ask for at a rental auction) and she has likely seen the value of the land double since she bought it, given the rising price of land in the area. In order to expand his farming operation, Batalden discovered that outside private investment was not only a good option, "It was the only option."

Batalden's rental of the farmland he uses is mutually beneficial for he and the landowners. They get to have someone care for their land, build the soil and keep invasive weeds out

while the young farmer, who supplies all of his own equipment, gets access to prime cropping ground in his community.

Farming with Foresight

It's not just the price of the rental rates that provided Batalden a leg-up when he was getting started—the length of those leases has also helped. The long-term leases he has are rare among the farmers in his area who are typically renting on year-to-year or three-year leases. Batalden feels more secure with his long-term leases, which give him the ability to work towards projects that will develop over longer periods. For example, he's built a four-acre native pollinator habitat with money from the USDA's Environmental Quality Initiatives Program. Batalden also has a contract with the USDA's Conservation Stewardship Program that supplies him with the resources to have a soil-friendly crop in his rotation, to buy seed for cover crops and to buy some necessary equipment needed to carry out these projects.

The long-term leases provide security in the immediate future, but Batalden does wonder about his post-farming plans. "Your retirement is your land when you farm," he says. "I don't own any land; I'm not building any equity."

He and his wife Tiffany have invested in mutual funds, stocks and bonds in preparation for retirement, but Batalden has his heart set on truly owning his own land one day. Still, he says, "I can't take out a 25-year-loan based on income projections on record crop prices, because there are not going to be record prices for 25 years in a row."

A Farming Family's Future

Batalden's parents are in their 60s and still actively farming. Retirement is not on the forefront of their minds, but in 2013 they started a dialogue with their children about transitioning the land and different scenarios that could come-up in the future. Most of Batalden's siblings are farming and he feels they would all be excellent candidates for taking over their parents' operation one day. He realizes the importance of this conversation for farmers everywhere.

"Typically a couple retires, they rent their land, they pass away and their kids, who are no longer living in the farming community, inherit it and sell it at auction," he says.

What's often not a part of this scenario is the conversation where that older farming couple asks their children what would become of the land once they're gone, what they want their legacy to be on that land and whether or not they should start looking for a new farming family with similar values to look after the land.

“By the time I’m ready to retire or am semi-retired, I hope I’ve built up the soil and that I have a system that will allow someone else to come in and take it over,” Batalden says. “Not everything I do out here is perfect, but I have to ask myself: ‘What’s the best I can do?’ ”

When Batalden knew he wanted to be a farmer, he knew it had to be in Lamberton. He couldn’t imagine farming without his dad, and the equipment, mentorship and support his family has provided him were a great advantage. His best advice for new farmers looking to get started is to go to the communities they’re considering living and working in and start knocking on doors.

“There’s no great database of absentee landowners,” says Batalden. “Some people may just turn you away but you may knock on the door of someone who knows someone who can help. Anyone who tells you that they got into farming without any help is lying — or they have a bad memory.”

Land Stewardship Project Farm Transition Profile: Teeming with Team Members

Caleb and Lauren Langworthy approached their farm dream like racecar drivers. They assembled a pit crew of people that could help them get moving and who were invested in seeing them succeed. They spent years honing their farming skills and months developing the financial chops and networks that resulted in them owning their own land. The process was multifaceted and, at times, almost haltingly difficult, but Blue Ox Organics now has two experienced, ambitious and able-bodied farmers at the wheel.

Finances & Farm Beginnings

In 2010, Langworthys, native Minnesotans, made their return to the state after gaining extensive experience in sustainable farming in Washington. Caleb had studied sustainable agriculture at Evergreen State College in Olympia and had, among other things, worked on the most diversified farm in that state. Lauren was an AmeriCorps volunteer who was involved with Master Gardener and 4-H programs in Olympia. She worked with low-income neighborhoods and youth, as well as at senior centers teaching people in the community about the origin and economics of their food and how to grow it in their own backyards.

Between the two of them, they were building a solid knowledge of low-input, sustainable agriculture and community outreach, but neither had developed a keen sense of the financial responsibilities that came with running a farm. “I did five internships while I was getting into sustainable agriculture,” Caleb, 28, explains, “and the finances were the one thing that was often left out. I knew that was going to be the weak spot.”

In Rochester, Minn., Caleb was teaching an urban gardening program to at-risk youths when he heard of the Land Stewardship Project’s Farm Beginnings course. He and Lauren saw it as a now-or-never opportunity to start their own enterprise.

“It was sort of right on the cusp of the internships and everything when we were kind of stepping into farming and starting to wonder if we should have our own business,” Lauren, 27, says.

The couple received a Farm Beginnings scholarship for the course and found some land to rent on a year-to-year basis just south of Eau Claire, Wis. All of a sudden, they were farmers, farming. “We had a place and some financial education and we had connected with a [Farm

Business Management Instructor] through Farm Beginnings and then it was like, well, now we've got kind of a mentor and our finances and we're doing it," says Lauren.

They started vegetable production in 2012 on their rented land and connected with some local markets, but several months into production, they knew they weren't going to be able to do a year-to-year lease again. "We had to get off the rented land," Lauren says. Caleb and Lauren had long-term goals for their farm that required production methods that would require two to three years to show results, something they couldn't rely on with a year-to-year lease.

The Land Search

The Langworthys started looking into different ways to secure land tenure in the Eau Claire and Menomonie, Wis., area, where they had developed great relationships with buyers at the markets they sold to. They considered long-term leases, lease-to-purchase and contract-for-deed arrangements. They were intimidated by land prices and were focused on rental options that would give them some longevity so they could build the soil they would grow on. What they found were many absentee landowners who couldn't give them that long-term security or many that had their own ideas about what the young farmers should be doing on the land.

"Many of [the landowners] really wanted to be a part of the farm, and that's great in some ways, but when it's your business, you need the flexibility to be making your own decisions," Lauren says.

The Langworthys resolved to buy land with the hope that they could secure a USDA Farm Service Agency (FSA) beginning farmer loan. For three months, the couple would look through listings and network within the community, as well as talk to friends at church, at the co-ops and at farmers' markets. Then, once a week, they would take a day to look at six to 10 properties in an area. Over a period of three months, they looked at over 100 farms. Most in their budget were bare ground, fallow or old hunting properties. Some had poor soil from years of monocultural soybean and corn production, no infrastructure or deteriorating structures that could almost be pushed over with one hand. Other new farmers they talked to told them to avoid the, "I can just build on it" mentality. One of their beginning farmer friends was going on year three of their operation and they had just then installed insulation in the home they had been renovating on their property.

"After awhile we were almost like, is this even worth doing or should I go back to my job teaching?" Caleb recalls.

The Investors

While the Langworthys were busy looking for land and trying to sell their produce, one of their buyers was busy selling the farming couple. At one of the co-ops in Eau Claire, they had a worker-owner who delighted in talking about them and the quality of their produce. He was their biggest advocate and he would stop people in the community to introduce Lauren and Caleb and to see if anyone had some leads on land.

“He was huge with helping us connect to a network of people who could help us find long-term access to land,” Caleb says. All of his pitching paid off when a couple who were longtime customers of the co-op told him that they were looking to invest some money in an organic farm and that they would like to meet with the Langworthys.

The two couples sat down to talk long-term farming ventures and to sort through their skepticism. The Langworthys were curious about this type of socially-minded investment and what kind of control the investors would want to have on the farm. The private investors were curious about how the young couple would pull off a farm business and how risky their investment would be.

The Langworthys’ ability to talk both farming and business and the financial knowledge they’d picked up in the Farm Beginnings course impressed the private investors and made them feel more secure in investing in the pair. “If we had only been able to speak in terms of farming, I don’t know that it would have worked out very well,” Lauren says.

The two parties held these discussions on the Langworthys’ business proposal for a month or so before they all started looking at land together. Then they spent three months looking for land, going through business plans and negotiating one another’s desires. The investors had owned several businesses and knew what it would take to get a new enterprise to a profitable place.

In the beginning, the Langworthys were interested in raising elderberries, starting a small vegetable Community Supported Agriculture operation and buying organic feeder calves to raise grass-fed beef. The investors were keen on all of these ideas except the grass-fed beef. They thought feed prices were too high and waiting two years for the finished product was too risky for a beginning farm. So they all agreed on sheep as an alternative. That way, the young farmers would have animals to help build the land’s fertility while producing cash flow with the wool and lamb.

“It was a pretty symbiotic relationship going back and forth with them,” Lauren says. “In the end, we found a plan that everyone was excited about.” “Communication was huge,” Caleb adds. “We went back and forth with business plans—two or three times a day we would be answering and asking a litany of questions.”

After a business plan was settled on, the investors were pretty hands-off. “They said they were ready to defer decisions to our best judgment and the judgment of our mentors,” Caleb says. “They’re not involved in running the farm.”

After a six-month search for land that covered over 100 farms, the farmers and the investors narrowed it down to eight possibilities and then to one: a 153-acre former dairy farm near Wheeler, Wis., just outside of Menomonie. The investors closed on the property in December 2012.

FSA Beginning Farmer Loans

While Caleb and Lauren Langworthy had to wait four months to get a USDA Farm Service Agency (FSA) loan, they were actually quite fortunate. FSA loans can take anywhere from four months to over a year to finalize, making it nearly impossible for beginning farmers to actually use them.

"We couldn't have done FSA if the investors wouldn't have come in and bought the land initially," Caleb says. "There's no way the sellers would have waited four months for our loan to come through."

Their loan process was sped up in part because FSA was confident taking a chance on the Langworthys after other investors already had. The loan was also expedited because when the couple made Blue Ox Organics a Limited Liability Company (LLC) it was listed as a female-led farm. By making Lauren the majority owner, Blue Ox was a "socially disadvantaged" new farm, qualifying it for special beginning farmer program treatment.

"FSA is a big animal to maneuver," Lauren says. "The structure of it is not easy on the people working there and it's not easy on the people applying for loans. There's got to be a way to streamline the process that doesn't require a four-inch binder full of paperwork by the time it's done."

Initially, the plan was to have the investors buy the land and then the Langworthys would either rent it from them or buy the land. The farmers were worried about how they would build equity on a farm if they didn't own any of it. The investors agreed to sell the land to them and to provide them a mortgage on it. Then, the Langworthys approached the FSA about taking on half of that mortgage, so the private investors could spread the risk.

In the end, the investors used their purchasing power to buy the farm at a reasonable price per acre and get it off the market straight away while Caleb and Lauren began the four-month-long process of getting their FSA beginning farmer loan approved. This is a "split mortgage" with the FSA—the investors have the first lien on the property (*See FSA Beginning Farmer Loans text box).*

The private investors decided that, based on the Langworthys' business plan, the farm would reasonably turn a profit in five years. They also decided that the couple would need an additional "incidentals loan" to cover fuel and other small costs. They generously allowed the young farmers to defer payments on both loans for the first five years while the farm is being established, meaning the Langworthys' first mortgage payment to the investors will be in 2018. The interest accruing over those five years will be amortized— that means it is spread out over the life of the loan and the investors will eventually receive the interest due them over that period of time. The Langworthys only need to pay interest on the first year of their FSA loans, a bit of principle and interest during the following two years and then full mortgage payments by year four.

It Takes a Team

Today, the Langworthys are producing vegetables for their markets in Menomonie and Eau Claire, expanding their production to begin a Community Supported Agriculture operation and starting an elderberry enterprise. They recently launched a sheep operation with 50 ewes, with plans to grow to 100 breeding animals over the next four years. The Langworthys are also enrolled in the Land Stewardship Project's Journeyperson Course as a way to further their Farm Beginnings education and experience.

"We always tell people that it took a team to do this," Lauren says. In taking the Farm Beginnings course they had the benefit of a Farm Business Management Instructor; and through the co-op and the FSA, they received outside private investment, secure land tenure and start-up loans. Now, their team includes a retired organic farmer a few miles down the road who has taken them under his wing and is helping them to get established in the Wheeler community.

And that team includes the community itself. Having grown up in small towns themselves, the Langworthys know that the social dynamics of rural pockets like Wheeler can be touchy to navigate. They are hoping that their contribution to keeping the countryside alive, keeping a barn and a home up and farming ethically will get the community on board. As small-scale farmers in a climate of industrial agriculture, Caleb and Lauren are ready to prove that Blue Ox Organics is a necessary part of the local food economy.

"I think it's kind of up to us to prove that we're not just playing hobby here over the next 10 years," Lauren says. "They're not just going to believe that we're a business—we have to show them."

To view a multi-media slideshow featuring the Langworthys talking about how they used the team approach to launch their farm, see www.landstewardshipproject.org.

Land Stewardship Project Farm Transition Profile: Trust in the Land

Jon Peterson's day starts at 5 a.m. He milks the 55 organic dairy cows at his farm near (aptly named) Peterson, Minn., while his son collects the eggs from their 2,300 organic hens. Both the milk and the eggs will be picked up by the Organic Valley Co-op and transported from their farm, which is tucked amongst rolling green hills along the Root River. It's hard to imagine subdivisions, or a thousand-head livestock farm, or a frac-sand mine leering up through the morning mist of the surrounding landscape. But these enterprises are a potential part of this region's changing landscape and, in the early 1990s, Peterson was feeling these pressures on his farm as well as his father's neighboring farm to an alarming degree. The father and son decided they needed to do something binding and permanent to protect their land from development. Now Peterson is hoping this protection will help ensure a new generation will have the opportunity to produce food profitably in such a beautiful place.

Changing Times

Peterson started his farming operation when he was 17. Just out of high school, he bought 12 cows and rented a barn with a loan his father, John, reluctantly co-signed. They went to a local bank and talked with the loan officer who, as Peterson puts it, either trusted you or he didn't. In Peterson's case, it was the former.

"You could go in there and your word was good enough," he recalls. "You didn't have to fill out form after form—he trusted you and I made dang sure I paid him back and each time he trusted you more and more."

Among other things that have changed with banking since then are interest rates. Jon borrowed at an interest rate of around 15 percent, almost five times current rates. When he was ready to buy his first 80 acres, he paid $600 an acre, one-sixteenth of what land in his area is going for now.

The other thing that's changed is the industrial model has become the norm on most livestock farms in the area, with conventional livestock farmers forced into getting bigger and bigger in order to compete. "When I first got started dairying here 25 years ago, I didn't know any farms that had 100 cows," Peterson says. Now, "there are some that have 1,000."

Jon began transitioning to organic in 1997 after researching the USDA's Low-Input Sustainable Agriculture (LISA) program—now the Sustainable Agriculture Research and Education (SARE) program—and attending Land Stewardship Project meetings on grazing. Organic wasn't that much of a stretch from what he was already doing on his diversified farm, and he was interested in getting a higher price for his milk and eggs. It also helped that his father was not that interested in using chemicals on his own land and frugal when it came to any inputs he might need.

"Everybody ships in fertilizer and ships in other inputs and fertility wasn't built that way," says Peterson. "Four, five hundred years ago, nature didn't haul nitrogen in from Kuwait to dump everywhere."

Easement Protection

In the early 1990s, prior to the acceleration of industrial agriculture in the area, Peterson and his father were more concerned about the growing number of housing developments springing up in areas where woodlands used to be. The father and son, with their properties right across the road from one another, thought that if they could find a way to protect all of their land from developmental interests, in perpetuity, it would make even the land right around theirs seem undesirable to potential developers.

"The big thing was that we didn't want the land to become new housing," Peterson says. "We were afraid that all of this land around here was going to get split up for houses, and a lot of it did."

The younger Peterson had read about conservation easements and land trusts, which are nonprofit organizations interested in preserving land from development. They do this by acquiring the developmental rights to a parcel of land by either buying them or, more often, receiving them as a donation from a landowner. (*See Land Easements text box for more information.*)

Eventually, Peterson approached the Minnesota Land Trust about such an arrangement. At the time, he had about 210 acres of land and he wanted to protect almost all of it, so he entered into four years of negotiations and appraisals with the Trust about what they were willing to allow him to do, how much the land was worth and what development rights he was willing to give up. The Minnesota Land Trust is generally averse to allowing farming on

eased land, but they were interested in Peterson's property because of the large amount of timber he has along the Root River. The Trust appraised his land, came up with a dollar figure that represented what they saw as the developmental potential of his land that he was giving up, and paid him about 40 percent of that value. The rest of it Peterson was able to claim as a charitable donation on his federal taxes.

According to the agreement the farmer and the Trust came up with, he is able to continue farming on the land, but cannot build any new structures, mine, or split up the land and sell it in pieces; and he must keep certain areas in grassland. Jon still owns all of the land, but he has, essentially, sold its development rights. From the agreement, Jon exempted several acres of buffer zones surrounding the buildings already existing on the property so he could expand them if he wanted. The bottom line is Peterson has agreed to give up a large amount of the potential market value of his land in order to ensure his legacy of stewardship.

"I have to realize that when I sell it, I'm not going to make a ton of money on it," he says.

After Peterson signed his agreement with the Trust, his parents started their own negotiation process with the organization to place easements on most of their land. Before it was all finalized, John Peterson had passed away. Peterson bought approximately 400 acres of his parents' land in 2006, which was mostly under an easement by then (it's largely woodland and pasture). In 2011 his mother, Arlyss, put another 150 acres of the original homestead under an easement, meaning a total of approximately 750 acres of the Peterson farm is now protected from development.

The decision to enter all of his land into easements was not made without seriously considering the opportunities the easement would and wouldn't offer future farmers. "You're doing something that's forever," Peterson says. "I thought, 'Do I have the right to make that decision for my kids or grandkids—that they can't do certain things with the land?' They can't build on it. If they choose to start a hog farm or expand the dairy, they can't build a big confinement building."

Jon worries about the rigidness of the easements given inevitable changes that will come to the community. "Have I created this island that someone is stuck in? Land that someone can't do anything with while everything around them is developed?" Peterson asks, adding that the easements may restrict a future farmer from adapting to changing markets and farming techniques.

Land Easements

A conservation easement is an agreement between the landowner and a land trust where the landowner agrees to limit or end development on a piece of property in order to permanently preserve it for its conservation features. Conservation features could be significant wildlife and plant habitat, natural and agricultural resources, lake or river shoreline, wetlands, or important scenic or cultural lands that benefit the public. The agreement applies to the current landowner, as well as all future landowners.

Easements are great if you have a strong land ethic and the desire to preserve your land for future generations, but don't count on big financial benefits. In Minnesota, the tax incentives for an easement—like reduced income, estate and property taxes—are not as great as, say, Iowa's. Minnesota still taxes on the full, pre-easement value of the land. That means a farmer like Jon Peterson is only receiving the federal tax benefits and still paying taxes on the original, financial value of the land before the easement was put in place.

Accessibility to land trusts is also based on region, with such organizations much more prevalent on the East and West Coasts than in the Midwest, for example. More trusts mean more opportunities to find one that is open to providing easements to farmers who wish to continue farming on eased land.

A Farmer's Legacy

Peterson's father was 79 when he passed away and he never retired. The conversation about transitioning the land was seemingly too difficult to address and he didn't talk about a life after farming. "About other farms that came up for sale I'd ask, 'Well should I buy that or are you going to sell me some of yours?' and he just kind of pushed away from it," Peterson recalls.

The foresight his parents, particularly his mother, had to put their land into easements, however, made it affordable for Peterson to purchase farmland after his dad had passed away.

Both of Peterson's children, Taylor, 24, and Kaitlyn, 20, are interested in dairying and he and his wife Lori are hoping one or both of them eventually farm the family's land. Their daughter graduated in 2013 from Northeast Iowa Community College with a dairy science degree. Taylor went to school there for a year before coming back to farm with his dad and he intends to continue farming organically.

While he wishes easements could be amended by future parties, making them more flexible and better tailored to preserving land on working farms, Peterson also knows he's given future farmers like his children more than just strictly regulated land.

"I'm also giving them the opportunity to buy land at a reasonable price, like I did," he says.

Land Stewardship Project Farm Transition Profile: Luck, Pluck & Relationships

With any luck, a young farmer shouldn't need it—luck that is—to access land. Mary Ellen Frame, 77, is a retired farmer in Northfield, Minn., and she and the two young farmers she has helped get established describe their farming relationship as one in which each of them got extremely lucky. In reality, what brought them together has a little to do with luck and happenstance, and a lot to do with careful planning and negotiation.

The two young farmers are Erin Johnson and Ben Doherty, and their journey into owning and operating their own farming operation started when they were both working at the Food Bank Farm, a 60-acre organic operation in western Massachusetts. There they both gained valuable farming experience and learned how to make a living with a small-scale produce farm, sowing the seeds of their dream to one day own and operate their own Community Supported Agriculture (CSA) operation.

They chose to start in Northfield, a community south of the Twin Cities that in recent years has become a destination for sustainable agriculture in the state. Johnson's family had moved there and she and Doherty wanted to be closer to them and to a community that has become increasingly attractive to small-scale, low-input farmers. Northfield has two college campuses with research and student resources, a burgeoning farmers' market and co-op and the appeal of a diverse and lively town in the heart of rich farmland. These factors were conducive to finding a retiring farmer that wanted to transition her land. In turn, the community's dynamics helped a landowner like Frame find new farmers who shared her land stewardship values.

Northfield's Sustainable Ag Boom

In the early 2000s, Frame, a Northfield native, began noticing that many of the sustainable farming projects starting up in town were being pioneered by young people, fresh out of college with liberal arts degrees. It was the start of a shift in thinking about the connection

between the health of the planet and how food was being grown. More young environmentalists were taking to farmland to support, and participate in, cultivating local food systems. Doherty, 34, has noticed it accelerating even more in the last three or four years. “There has been this college-level focus on local food and it’s boomed in Northfield,” he says. A third of the produce Doherty and Johnson raise goes to the dining programs at Saint Olaf College and Carleton College in Northfield.

This focus on supporting small-scale farmers is a stark contrast to the agricultural trends Frame experienced in her 20s and 30s, when the philosophy of “get big, or get out” kept young people out of farming in droves.

“Young people were told that you couldn’t earn a living farming unless you got really big,” Frame recalls. The next generation of farmers tried to acquire more and more land and embrace the industrial model that still exists today. “At that time, the countryside was emptied out of a lot of young people. They were going to towns and cities to figure out how to earn a living.”

Seed Money

During Johnson’s four years and Doherty’s three at the Food Bank Farm, they had saved $20,000 to put towards securing land. When they arrived in Northfield to begin scouting plots, they discovered they had much to learn. “We didn’t know anything about finding land,” Johnson, 38, says.

They were hoping to work with a land trust, a popular model in the Eastern and Western U.S. where a nonprofit organization buys the rights to the development potential of a piece of land, allowing a farmer to pay much less for it. But land trusts have not gained widespread traction in the Midwest, so it soon became clear to Johnson and Doherty that they would need to rent property at first.

Johnson’s mother had mentioned that they should contact Frame, who had deep roots in the sustainable farming community, had helped establish a local co-op and had held a number of positions with the Cannon River chapter of the Sustainable Farming Association of Minnesota. Frame was taken with the couple, whose dream of a CSA was similar to one she had always dreamed of starting. Frame had title to five acres of tillable land and four acres of

woodlot with a house she had built on it. The five acres had been farmed by two brothers, and they had honored Frame's wishes that it not be sprayed. The brothers owned many more acres of land and Frame told Johnson and Doherty she would consider asking the brothers if they would terminate their lease on her five acres in order to free it up for the couple.

Johnson and Doherty returned to Massachusetts to consider their farming future. Two months later, Frame sent them a hand-written letter asking them if they'd like to rent her land starting in 2006 and the couple jumped on it. Johnson's parents took photos and collected soil samples while Johnson and Doherty prepared to make the move to Northfield. Over the following few months, Frame and the young couple exchanged hand-written letters—the new farmers were shocked at how much trust and confidence Frame had in them. "She knew we were coming from organic but she didn't know if we could grow anything. She just immediately trusted us," Johnson says. Doherty adds, "We were ready and experienced enough to start it, but there were so many things we still didn't know."

The first few conversations that the three of them had about the land were simple and came down to one guiding principle: no chemicals. The rest was played by ear. Frame okayed a compost pile, irrigation system, greenhouse and electricity in the greenhouse. Johnson and Doherty were articulate in laying out their dream for the operation: ideal number of CSA members, how they intended to market extra produce and how they would both generate a living while making payments to Frame. The brothers who had farmed the five acres helped Johnson and Doherty with plowing and Erin's relatives and their friends helped them prepare the ground and plant even before the two arrived. The couple got an apartment in town and spent two summers getting everything established. They talked to the company in charge of spraying the brothers' land about ways they would need to mitigate potential chemical drift. During the winters, Johnson worked at the local food co-op while Doherty worked at a plant nursery and substitute taught.

They paid Frame the same rental rate that conventional farmers in the area were paying. The first year, they suffered through softball-size hail and growing pains learning how to operate the new farm. Besides dealing with soil, climate and pest obstacles that were new, the couple had the daunting responsibility of owning a business rather than simply working for one.

The difficulties of their first year, however, only strengthened Frame's faith in the young couple. "It was kind of a test for them, but I had thought they passed the test very well," she recalls. The next winter, as luck would have it the renter of the home Frame had built on the woodlot moved to town and in 2008 Frame sold the farm — the five acres and the woodlot with the house— to Doherty and Johnson.

After just two years, Frame had found farmers outside of her family who shared her land ethic, and she had discovered that she was willing to sell them some of her land and the very

home she'd built on it. Frame hadn't thought about how she would transition her farm before she met the couple. "They [Johnson and Doherty] were talking about their vision for their farm and I hadn't been able to achieve that. There are two of them, they're young," Frame says.

The three worked out a contract for deed, which means for the first 10 years of their mortgage payments, Frame is essentially the bank. She holds the mortgage, and Johnson and Doherty pay her every month based on the price and interest rate they agreed upon with her. Frame told Johnson and Doherty the assessed value of the land and property (the assessed value of property is often lower than the market value) and had Johnson and Doherty come up with three prices and interest rates that they thought they could pay based on that value. She accepted both the lowest price and the lowest interest rate the two proposed.

The contract for deed is beneficial for Frame because it includes a balloon payment after the 10-year period. This means that when the contract is up, Johnson and Doherty will go to a bank to take out a loan for the remainder of the money they owe Frame, pay her, and then finish paying off that loan at the bank. When the time comes for them to take out the bank loan, they are more likely to secure it given their experience paying a 10-year mortgage to Frame.

More Than Luck

Besides selling wholesale vegetables to local institutions, Doherty and Johnson's operation, Open Hands Farm, is also a CSA. It started with six members, Frame being one of them, and has grown to 160 members today. Johnson and Doherty intend to keep it at that number for the time being. Farming neighbors and community members that have grown up around the farm comment to Frame about the speed with which it has been established and how beautiful it has become. Frame has the satisfaction of not only seeing it thrive in the hands of people she respects, but of still being seen as a part of its success. The amount of work Johnson and Doherty put into the farm worries Frame at times, but she can't help getting excited about the respect and admiration the two have earned from the community.

"I could sense their dedication to farming," Frame says. "You aren't really dedicated to any land until you've worked it, but when you have worked on a place, then you begin to love it. It's a connection that grows and it's exciting; it gives me hope. They're doing what I had hoped to do; they're carrying my dream forwards."

That's an awesome responsibility, but Johnson and Doherty say that taking it on creates a win-win situation. "I think the hardest part is probably finding somebody outside of the family that you feel shares your values," Johnson says. "She poured her heart and soul into

the whole place. I think she's pleased to have us here doing what we're doing and taking care of it and feeding lots of people with great food."

Ben Doherty and Erin Johnson weigh in on starting a CSA and finding a Mary Ellen Frame:

• Start by interning on somebody else's farm.

> "Work for many years for other people," Doherty says. "Learn from their mistakes — no less than three years, five or more would be better."

• Start interning or working on a farm *in* the area you intend to start your own farm.

> "Start learning about that community and the land," Johnson says. "If my parents hadn't been here [in Northfield], we don't know how it would have come together."

• Ask for help.

> "Farming is a community event, especially if you need help," Doherty says. "There are some local, conventional and organic corn and bean farmers around here that are really supportive and encouraging and open with equipment and knowledge."

• Save money.

> "Save as much money as you can," Doherty says. "At least $20,000 — more is better, of course."

• Be flexible.

> "The vision of the farm has changed over the years, but we've really achieved what we set out to do," Doherty says. Johnson and Doherty have thought about bringing goats onto the farm; they've expanded to more acres and decided to cap at fewer CSA members than they had initially planned; they've considered adding chicken and grains. "You have to be really nimble," Doherty says.

• And to the future Mary Ellen Frames who may consider a farming couple outside of the family to transition land to:

> "Trust and be open," Doherty says. "Be discriminating and careful, but it's so easy to just say, 'they can't do it' and stop there."

Mary Ellen Frame weighs in on transitioning land to non-family and how to choose a new farming family for your land.

• Get to know their farming background.
"Erin and Ben had farming experience. They'd been working on a CSA in Massachusetts and had learned how to do everything. I had been watching [while they rented] what they did and how much knowledge and skill they brought to farming."

• You can't farm forever.
"Nobody is going to live forever and nobody is going to be able to farm when they're 90- and 100-years-old. It is important to start thinking about it. I didn't think about it then. I just got lucky. We can't all count on being lucky. I could've had some accident that made it impossible for me to work. I could've gotten sick."

• Consider the legacy you'd like to leave.
"If you have a long-term interest in what happens to the land, if it is important to you, think about the health of the land."

• Take into account the farmers'….

- Character: "The way people talk about what they are going to do."

- Dedication: "There are going to be really tough times; farmers have to be super adaptable. So if you get hit by a flood or hit by a drought, or three years of drought, what kind of dedication will you have to be able to work and adapt to the new climate and conditions you'll face? And market conditions will change all the time."

- Ask yourself: "How realistic is their business plan? Is it something that is actually going to work?

• And to the future Erin Johnsons and Ben Dohertys who may seek out a retiring farmer, outside of the family, to transition land to them:
"Not everyone is going to succeed; there are going to be failures. One of the plagues of the sustainable system is economic — you have to be able to pay for the land, and that's not easy. It's very hard in the present market for somebody to pay for the land by farming it, in any system. So you have to find out if the [potential renter or buyer] has skills to not only do the farming but the business — promotion of the products and things like that. There are plenty of young kids who are idealistic but don't know how to work, don't have a practical attitude toward what they're doing, and it doesn't do anybody any good for them to take over some land and fail."

Land Stewardship Project Farm Transition Profile: Leaving an Organic Legacy

Craig Murphy, 58, brushes the dust off an aerial photo of his farm from the late 1980s. He sets it on his kitchen table in the home that five generations of Murphys have grown up in near the west-central Minnesota community of Morris and uses his finger to draw a map on it. He points to different structures and fields to explain what has changed and what has remained. He draws imaginary borders outside of the frame to create a picture of how the community and his neighbors' farms have changed since he got started as one of the first certified organic farmers in the area. As he talks about potentially transitioning his land to non-family for the first time in its history, his words draw a broad, borderless image where anything seems possible.

Pioneering Roots

Murphy's great-grandparents started the homesteading process in Morris in 1876 and eventually raised 12 children on the same land Murphy farms today. The torch was passed from Murphy's great-grandfather, to his grandfather, to his father, to him. They were the ones that wanted to stay on the land and farm it; everyone else left. His great-grandparents and grandparents had horses, pasture, diversified crops and livestock; they understood that all of those things were critical to supporting the health of the soil they relied on.

Murphy's father, Ray, farmed wheat, corn, soybeans and alfalfa. But after high school, Craig's original goal was to become a veterinarian, and he eventually got an animal science degree from the University of Minnesota. After school, he moved 300 miles south to Battle Creek, Neb., to sell services and supplies for a co-op. He lasted eight months before the farm in Morris wooed him back equipped with a different mentality towards his relationship with the land.

"I just didn't want to deal with a jug that had a skull-and-crossbones on it," Murphy says. "I just thought there's got to be a more natural way. And I kind of wanted the challenge of it too, to see if I could make [organic] work."

Soon after returning to the farm in 1980, Murphy talked to his father about farming organically. Through other farmers and newsletters, Murphy had heard about the Northern Plains Sustainable Agriculture Society (NPSAS), a grassroots educational and advocacy organization that helps farmers in the Dakotas, Minnesota, Montana, Iowa, Wyoming and Nebraska transition to organic. Murphy attended a conference NPSAS was holding in North Dakota, where he met Gary Ehlers, an organic crop grower who lived 30 miles from Morris. Ehlers served as the young farmer's mentor throughout the development of his organic dream.

Murphy's father was open to the idea of his son coming back to farm and offered to help him get started with 80 acres and a barn in exchange for help on the other 800 acres of owned and rented land he worked at the time. Murphy used the 80 acres to raise hogs, soybeans and alfalfa. Ray Murphy shared what machinery he could and an uncle loaned Murphy the money to buy the rest of the implements he needed. By 1983, the 80 acres was certified organic. Through NPSAS, Murphy connected with a company that was willing to buy his entire organic production and market it. Today, he either direct-markets it himself or uses a broker and marketing agent through the National Farmers Organization.

Over the years, Murphy increased the amount of land he rented from his father and a neighboring farm until he had 450 acres certified organic. His father retired from farming in 1987 and Murphy decided to transition out of hogs and into organic beef cattle, which he raised for 25 years, along with a diversity of crops. Murphy got rid of his cattle operation in 2011 and now grows organic wheat, rye, sunflowers, flax, soybeans and corn.

Murphy doesn't regret his decision to go organic, but concedes there are challenges on a day-to-day basis: weeds; managing an organic fertility program and an insect-control program; and dealing with rain that turns your soil into a swamp.

Murphy's conventional neighbors look at what he's up against, "And they're like, 'No way,'" he says. They respect what he's doing and one of his neighbors even helps with Murphy's harvesting but, "They see it all; they don't want to go organic. With all of the technology at their disposal they're making it [conventional] look pretty good, and if you don't get in too close, if you don't think about the GMOs, it does look pretty good."

Farm Transitions

Ray Murphy passed away in 2011 and with that, his family went through a puzzling land transition. The elder Murphy had 240 acres in his name, and it was split-up between Craig and his seven siblings. Murphy had been renting some of that land from his father, and he had transitioned it to organic. His brothers and sisters all decided to sell their shares and, while Murphy would have loved to have purchased that land from them, it would have cost upwards of $1.3 million. He bought 11.8 acres from his siblings at a discounted price, as well as 32 acres of his father's pasture and 15 acres of Conservation Reserve Enhancement Program (CREP) land. The CREP land has to stay in grassland in exchange for a yearly rental payment from the Farm Service Agency that Murphy will receive until 2016. Although

some of the land Murphy's father put into CREP was tillable, he did it to promote diversity on his property. Murphy is glad his father did it and proud to now own that land himself. "I don't mind having that kind of diversity," he says, "It's okay not to farm every square inch."

Today, Murphy owns 145 acres of tillable land and rents 150 acres from his uncle—all of it is certified organic. The land his siblings didn't sell to him immediately lost organic status to the new owners, who are growing wheat and sugar beets conventionally. On a recent summer day Murphy watches the land that used to be organic getting sprayed with chemicals several fields away from his rye. "I've seen this happening quite a bit," Murphy jokes sardonically, "so, I think we can say that it is officially not organic anymore."

That clearly troubles him. Even with all of the challenges and rocky transitions, Murphy has an organic or bust attitude. "If I couldn't have done organic," he says, "I wouldn't have farmed. I wouldn't have the heart for it."

In order to avoid a situation like this, where his land is one day sold to the highest bidder rather than the best caretaker, Murphy is already looking to begin transitioning it. Through the Land Stewardship Project and other networks, he's seeking a farming family interested in getting a foothold in agriculture. Murphy is open to any ideas and enterprises that a new farmer has in mind, and, because he's starting the transition process early, he's hoping to find someone with an organic enterprise to keep the land chemical-free. "I'm not old," Murphy says. "I just don't want to start something new without help." He's hoping within 10 years to start renting tracts of his land gradually so that his control of the farm diminishes while a new farmer takes the reins.

"Whoever would come here would have to, first of all, love the area," Murphy says. Ideally, they would spend a season working with Murphy on the land, and then come up with a project of their own. They'd need to develop an enterprise and business plan that could support them whether that's a Community Supported Agriculture operation, greenhouses or a livestock enterprise.

"What we have right now is supporting one family, so they'd have to develop something else that could support another person or family though the transition," Murphy says.

In return for all of this, they would get a discounted rental rate and the benefit of Murphy's 30-plus years of experience, his support and the use of his equipment. Murphy believes that every beginning farmer could benefit from a Gary Ehlers to mentor them and someone like his dad to give them a chance to get started on some land. He hopes he could be both.

"Most older famers want to see younger farmers on the land, because the alternative is just more factory farms," he says.

Farm Transitions Resources

Agricultural Conservation Easements

Farmland Protection Directory. Farmland Information Center, American Farmland Trust.
www.farmlandinfo.org/directory

Land Trust Alliance. Online database of state, local, and national land trusts in the United States.
http://findalandtrust.org/

U.S. Department of Agriculture (USDA) conservation easement programs.
www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements

Beginning Farmer Financial Planning

Ag Decision Maker. Iowa State University.
http://extension.iastate.edu/agdm

Beginning Farmer Resources. Appropriate Technology Transfer for Rural Areas (ATTRA).
https://attra.ncat.org/attra-pub/local_food/startup.html

Agricultural Business Planning Templates and Resources - RL042
Basic Accounting: Guidance for Beginning Farmers - IP443
Evaluating a Farming Enterprise - IP041
Financing Your Farm: Guidance for Beginning Farmers - IP420
Finding Land to Farm: Six Ways to Secure Farmland - IP349
Planning for Profit in Sustainable Farming - IP419

Building a Sustainable Business: A Guide to Developing A Business Plan for Farms and Rural Businesses. Minnesota Institute for Sustainable Agriculture.
www.misa.umn.edu/Publications/BuildingaSustainableBusiness/index.htm

Fearless Farm Finances. Midwest Organic and Sustainable Education Service (MOSES).
www.mosesorganic.org/farmfinances.html

Financing the Farm Operation. University of Minnesota Extension.
www.extension.umn.edu/distribution/businessmanagement/DF2589.html

Beginning Farmer Courses

Farm Dreams. Land Stewardship Project.
http://landstewardshipproject.org/morefarmers/farmdreams

Farm Beginnings. Land Stewardship Project.
http://landstewardshipproject.org/morefarmers/farmbeginnings

Greenhorn Grazing Program. Iowa State University Extension and Outreach.
www.iowabeefcenter.org/events/GHgrazingflyer.pdf

Journeyperson Farm Training Course. Land Stewardship Project.
http://landstewardshipproject.org/morefarmers/lspfarmernetwork/lspjourneypersonfarmtrainingcourse

Wisconsin School for Beginning Dairy & Livestock Farmers. Center for Integrated Agricultural Systems at University of Wisconsin-Madison.
www.cias.wisc.edu/dairysch.html

Wisconsin Schools for Beginning Fruit, Vegetable and Flower Growers. Center for Integrated Agricultural Systems at University of Wisconsin-Madison.
www.cias.wisc.edu/category/education-and-training/school-for-beginning-market-growers/

Business Entities for Farm Transfer

Farm Business Transfer Strategies. Transferring the Farm Series #2, University of Minnesota Extension.
www.extension.umn.edu/distribution/businessmanagement/components/M1177-2.pdf

Using Partnerships & Corporations to Transfer Farm Assets. Transferring the Farm Series #3, University of Minnesota Extension.
www.extension.umn.edu/distribution/businessmanagement/components/M1177-3.pdf

Connecting Landowners and Farmers

FarmLink. State-by-state listing of farmer-landowner connection programs.
www.farmtransition.org/netwpart.html

Midwest Farm Connection. The Land Connection.
www.midwestfarmconnection.org/farms/

MOSES Land Link-Up. Midwest Organic and Sustainable Education Service. http://www.mosesorganic.org/landlinkup.html

Seeking Farmers Seeking Land Clearinghouse. Land Stewardship Project**.** http://landstewardshipproject.org/morefarmers/seekingfarmersseekinglandclearinghouse

US Farm Lease. www.usfarmlease.com/

Contracts for Deed

Contract Land Sales. National Sustainable Agriculture Coalition http://sustainableagriculture.net/publications/grassrootsguide/farming-opportunities/contract-land-sales/

Frequently Asked Questions on Contracts for Deed in Minnesota. Farmers Legal Action Group (FLAG) www.flaginc.org

Installment Sale Contracts for Beginning Farmers. Partnership for America's New Farmers. Drake University and Drake University Law School. http://americasnewfarmers.org/installment-sale/

Land Contract Guarantee Program. Farm Service Agency, USDA www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=pfs&newstype=prfactsheet&type=detail&item=pf_20120120_farln_en_lcgrnt.html

Deed Restrictions

Conservation Easement vs. Deed Restriction. 2008. Land Trust Alliance Fact Sheet. www.landtrustalliance.org/conservation/documents/CE-deed-restriction.pdf

Farm Transitions Programs

Beginning Farmer Center. Iowa State University**.** www.extension.iastate.edu/bfc/publications-and-webinars

Beginning Farmer & Rancher. Center for Rural Affairs. http://www.cfra.org/beginning-farmer-rancher

International Farm Transition Network.
www.farmtransition.org/

Land For Good.
http://landforgood.org

Farm Transitions Network. Renewing the Countryside and Sustainable Farming Association of Minnesota.
http://farmtransitions.org/

Sustainable Farm Lease. Sustainable Agricultural Land Tenure Initiative, Leopold Center for Sustainable Agriculture.
http://sustainablefarmlease.org/

The Farm Transfer Network of New England.
www.farmtransfernewengland.net/

The Land Connection.
www.thelandconnection.org/

Farm Visioning

Whole Farm Planning and Goal-Setting Handbook, Minnesota Institute for Sustainable Agriculture.
www.misa.umn.edu/Publications/WholeFarmPlanning/index.htm

Grazing Contracts

Contract Grazing. Midwest Perennial Forage Working Group.
http://greenlandsbluewaters.net/Perennial_Forage/contract.html

Landowner Resources

A Landowner's Guide to Leasing Land for Farming Handbook. Land For Good**.**
http://landforgood.org/wp-content/uploads/LFG-Landowners-Guide-To-Leasing-To-A-Farmer-Handbook.pdf

Farmland Leasing for Private Landowners: A Short Guide. Land For Good.
http://landforgood.org/wp-content/uploads/LFG-Farmland-Leasing-Private-Landowners.pdf

Where Do I Start? Making My Land Available for Farming Guide. Land For Good.
http://landforgood.org/wp-content/uploads/LFG-Making-My-Land-Available-For-Farming-Guide.pdf

Women Caring for the Land Program. Women, Food and Agriculture Network**.**
www.wfan.org/our-programs/women-caring-for-the-landsm/

Land Valuation

American Society of Farm Managers and Rural Appraisers.
www.asfmra.org/

Leases

Ag Lease 101. North Central Farm Management Extension Committee.
http://aglease101.org/

Examples & Form Leases. Sustainable Farm Lease, Sustainable Agricultural Land Tenure Initiative.
http://sustainableaglandtenure.com/2010/06/form-leases/

Flexible Farm Lease Agreements. Ag Decision Maker, Iowa State University.
www.extension.iastate.edu/agdm/wholefarm/pdf/c2-21.pdf

Frequently Asked Questions about Sustainable Long-Term Farm Leases.
Farmers Legal Action Group (FLAG).
www.flaginc.org

Improving Your Farm Lease Contract. Ag Decision Maker, Iowa State University.
www.extension.iastate.edu/Publications/FM1564.pdf

Lease Examples. US Farm Lease.
www.usfarmlease.com/

Leasing Farm Land in Minnesota. Farmers' Legal Action Group**.**
www.flaginc.org/publication/leasing-farm-land-in-minnesota/

Sample Leases. Farmland Information Center, American Farmland Trust.
www.farmlandinfo.org/sampledocuments?field_sample_doc_category_tid=4192&field_topic_tid=All&field_state_tid=All

Sustainable Farm Lease. A Project of the Sustainable Agricultural Land Tenure Initiative. Drake University and Drake University Law School.
www.sustainablefarmlease.org

Legal Issues

Farm Legal Series. University of Minnesota Extension.
www.extension.umn.edu/distribution/businessmanagement/components/DF7291.pdf

Rental Agreements

Rental Agreements. North Central Farm Management Extension Committee.
https://www-mwps.sws.iastate.edu/catalog/farm-business/ncfmec-rental-agreements
- Fixed and Flexible Cash Rental Arrangements for Your Farm
- Crop Share Rental Arrangements for Your Farm
- Pasture Rental Arrangements for Your Farm
- Rental Agreements for Farm Buildings

Retiring Farmer Transition Planning

AgTransitions, Center for Farm Financial Management. Online planning tool.
www.cffm.umn.edu/products/AgTransitions.aspx

Planning the Future of Your Farm: A Workbook Supporting Farm Transfer Decisions. Virginia Cooperative Extension.
http://pubs.ext.vt.edu/446/446-610/446-610.html

Transferring the Farm Series, University of Minnesota Extension (10 Fact Sheets).
www.extension.umn.edu/distribution/businessmanagement/M1177.html

Estate Planning Series, University of Minnesota Extension (10 Fact Sheets).
www.extension.umn.edu/distribution/businessmanagement/M1178.html

Rural Living

Living on Acreages: What You Need to Know. Midwest Plan Service.
https://www-mwps.sws.iastate.edu/catalog/home-acreages/living-acreages

Success Stories

Transfer Strategies for Beginning & Retiring Farmers. Center for Rural Affairs. www.cfra.org/resources/beginning_farmer/success_stories

Trusts

Trusts as an Estate Planning Tool. Ag Decision Maker, Iowa State University (ISU) Extension and Outreach. www.extension.iastate.edu/agdm/wholefarm/html/c4-59.html

Preparing to Transfer the Farm Business. Transferring the Farm Series #1, University of Minnesota Extension. www.cffm.umn.edu/publications/pubs/farmmgttopics/transferringthefarmseries.pdf

USDA Conservation Programs

Wetland Reserve Program
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

Healthy Forests Reserve Program
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/

Environmental Quality Incentive Program
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/

Conservation Reserve Program
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