

Turning Grain into Dough

farm financial management for organic grain and crop rotation



**University of Wisconsin-Madison
Center for Integrated Agricultural Systems (CIAS)
Organic Grain Resource and Information Network (OGRain)**

July 2019

The text of this publication was prepared by Paul Dietmann, Senior Lending Officer, Compeer Financial.



The text of this publication was prepared by Paul Dietmann, Senior Lending Officer, Compeer Financial.

Turning Grain into Dough, farm financial management for organic grain and crop rotation, is a companion to the downloadable spreadsheet OGRAIN Organic Grain Compass, found at <https://ograin.cals.wisc.edu/resources/ograin-compass>

Support from the following organizations made this report possible:

The **Organic Grain Research and Information Network (OGRAIN)** is a project of the University of Wisconsin-Madison. Developed in 2015, OGRAIN provides resources, information and networking to enhance success with organic grain production. Offering field days, an annual conference, active listserv and online and written resources, OGRAIN is housed with the University's Department of Plant Pathology and is a collaborative effort of the UW-Madison Organic and Sustainable Cropping Systems lab, CIAS, Farm and Industry Short Course, and Midwest Organic and Sustainable Education Service. The Network is supported by a grant from the USDA Beginning Farmer and Rancher Development Program. Visit <https://ograin.cals.wisc.edu> for more information.

The **University of Wisconsin Organic and Sustainable Agriculture Research and Extension Program**, housed within the University of Wisconsin-Madison College of Agricultural and Life Sciences, supports organic farmers in the state through research and outreach efforts. Research includes investigations about reduced till organic systems, soil health under organic management, plant breeding for organic systems, and vegetable variety selection in organic systems. Outreach includes annual Organic Agriculture Field Days and the multi-faceted Organic Grain Research and Information Network (OGRAIN). Visit <http://www.uworganic.wisc.edu> or call 608-890-1503 for more information.

The **Center for Integrated Agricultural Systems (CIAS)** is a research center for sustainable agriculture in the College of Agricultural and Life Sciences at the University of Wisconsin-Madison. CIAS fosters multidisciplinary inquiry and supports a range of research, curriculum and program development projects. It brings together university faculty, farmers, policy makers and others to study relationships between farming practices, farm profitability, the environment and rural vitality. Go to www.cias.wisc.edu or call 608-262-5200 for more information.

Compeer Financial is a member-owned, Farm Credit cooperative serving and supporting agriculture and rural communities, providing loans, leases, risk management and other financial services throughout 144 counties in Illinois, Minnesota and Wisconsin. Visit <https://www.compeer.com> or call 844-426-6733 for more information.

Editing and project management by Jody Padgham, Outreach Specialist, UW-Madison Organic and Sustainable Cropping Systems

Layout by Ruth McNair, UW-Madison Center for Integrated Agricultural Systems

Cover photo by Harriet Behar

Reviewed by

- Harriet Behar, Outreach Specialist, UW-Madison Organic and Sustainable Cropping Systems
- Paul Bickford, Bickford Organics
- Dr. Paul Mitchell, Associate Professor, UW-Madison Department of Agricultural and Applied Economics
- Jim Munsch, Deer Run Farm
- Gene Schriefer, UW-Extension, Iowa County
- Dr. Erin Silva, Assistant Professor, UW-Madison Organic and Sustainable Cropping Systems Specialist

This publication is supported by a grant from the USDA Beginning Farmer and Rancher Development Program, grant number 2017-70017-26856. Copyright 2019, University of Wisconsin-Madison.



UW-MADISON
CENTER for INTEGRATED
AGRICULTURAL SYSTEMS



OGRAIN



COMPEER
FINANCIAL



Table of contents

Introduction.....1

 Organic transition overview1

Organic certification.....2

Things to consider as you contemplate a switch to organic production 3

Overall financial planning for the transition to organic grain production..... 6

 Organic Grain Compass: Is this economically feasible? 6

Developing an in-depth feasibility plan for the transition8

 Crop planning 8

 Yield and price..... 9

 Crop expenses..... 9

 Crop gross profit..... 9

 Equipment..... 10

 Buildings and infrastructure..... 11

 Farmer financials 12

 Further discussion 13

Beyond the Compass: Month-by-month cash flow projections..... 14

One more question to consider: Is the transition to organic a wise investment?..... 16

Final notes..... 18

Resources..... 20

Glossary..... 22

This page intentionally left blank.

Introduction

As of 2019 the five-year average farm gate price of organic corn in the U.S. is around \$9 per bushel while the average for conventional corn has been about \$3.50. Is it any wonder that some farmers are looking at what it takes to transition to certified organic production?

While prices for organic commodities look very attractive to farmers facing several straight years of declining net farm income, the transition to organic is neither simple nor inexpensive. The decision to transition must be made thoughtfully, and is much more than an economic decision. A farmer must be willing to commit to a significant shift in production philosophy, not just a change in practices in order to succeed.

Thousands of farmers who have transitioned to organic production have found the commitment and change needed personally and financially worthwhile. This publication and the accompanying Organic Grain Compass will help you estimate the financial implications of a decision to take on organic crop transition, in hopes of enhancing your chances of success.

Organic transition overview

Organic transition is a process that can take a considerable time commitment. To begin, all non-approved inputs and practices, such as the application of synthetic fertilizers and pesticides and use of GMO seed must be discontinued on the land where you wish to produce an organic crop. Alternative ways of managing the crop to address weed, insect, disease and fertility concerns must be developed. These will include adopting the use of cover crops and green manures, utilizing diverse rotations, carefully understanding tillage techniques, and planning soil-building processes, among others. Often new equipment or storage must be purchased and will have to either be segregated or cleaned for use on the organic crop.

Thirty-six months must pass from the last use of a non-approved substance until the harvest of the first organic crop. During this transition period, as you are learning how to manage your crops using new strategies, it is common for yields to go down. While you can expect a higher organic premium once you have an organic crop to sell, special markets for transitional crops can be hard to find. New investments in equipment or organic inputs may mean that production costs stay high.

During this transition period, as you discontinue familiar practices and learn new management strategies, lower yields and production uncertainties can be very stressful, leading to poor production and financial outcomes if you are not well prepared. You must be committed for the long-term to reach the full potential gains and relative stability of a mature organic production system.

TRANSITIONING FALLOW LAND

If land has not grown crops or been previously managed with non-approved substances or practices in the prior 36 months, the field can grow certified organic crops immediately. However, *fallow* land does not mean *fertile* land and generally more management is required to succeed with an organic crop.

Organic certification

While many farmers have heard of the need to work with an organic certification agency to become a certified organic operation, many are surprised to hear that the agency won't get involved until the final year of transition. Information on how to transition, including best practices and successful organic production strategies will generally come from other sources. Many resources for information about organic grain production can be found on the website of the Organic Grain Resource and Information Network (OGRain) at <https://ograin.cals.wisc.edu/resources>.

After you have gone through two years of transition you must research and choose a specific certification agency, to whom you will submit a multi-page application, which includes your organic system plan. Most certifiers have these applications available from their websites. After the application has been reviewed and accepted, a certification inspector will come to your farm to observe your growing crops, records and storage areas and verify all aspects of your organic system plan. The inspection report will be submitted to review staff at the certification agency who will determine if the practices you are following qualify you for certified organic status. A shorter, updated organic plan will be submitted each subsequent year, with annual inspections and review for continuing certification.

Organic certification fees cover the certification paperwork and inspection costs and may also include a per-unit assessment of annual organic product sales. Annual fees generally are between \$750 and \$1,000 depending on the size and complexity of your operation. The Federal Government supports an organic certification cost share program, which is administered by each state. The cost share generally will cover up to 75% (up to \$750) of annual certification costs. More information about the cost share can be found at <https://www.fsa.usda.gov/programs-and-services/occsp/index>.

Specific information about the certification process and how to choose a certification agency is offered by Midwest Organic and Sustainable Education Service (MOSES) <https://mosesorganic.org> and ATTRA, the National Sustainable Agriculture Information Service <https://attra.ncat.org>. ATTRA also offers sample organic plan documents, helpful in understanding the elements of organic production needed for certification.

Things to consider as you contemplate a switch to organic production

Start planning at least a year before beginning the transition.

Attend conferences and workshops, connect with experienced organic growers, and build a network that can provide support as you begin farming organically. Spend time with experienced organic growers at different times of the growing season and learn how they manage their production challenges. Figure out where you can buy organic seed, fertilizer, and any specialized equipment you might need.¹

Begin discussing your plans with your lender early in the transition process. Explain your plans and get your lender's thoughts. Your cash flow may change a lot during the transition. You'll want to make sure you have enough operating capital to carry you through. You may need financing for some new equipment or grain storage. You may need to restructure some existing debt to free up borrowing capacity. Fortunately, a farmer transitioning now to organic production is much more likely to find an ag lender who has some experience with organic farms than farmers who switched 30 years ago. If your lender doesn't have experience with organic production or isn't supportive of your decision, you may need to find a new lender. Ask your network for recommendations of lenders willing to work with farmers in organic transition.

Don't try to transition all acres at once. The learning curve for organic production can be steep as a farmer learns how to grow crops without the use of herbicides or standard commercial fertilizers. It often takes more time and labor to grow a crop organically. Planters and combines will need to be cleaned after leaving conventional fields and before entering organic fields. Start with a small enough acreage that it won't present the farm with a financial hardship if crop performance is poor in the first year or two. Start the transition on acres typical for your farm. Don't start out with the worst field you have, as it will be more troublesome to manage and not represent the positive potential organic production will have on your farm's soil health and future yields.

Organic transition is a long-term investment. The net cash flow could very well be negative on transitioning acres during the first two or three years of the switch. As with any other long-term investment, cash is invested upfront with the expectation of a positive return in future years. Cash returns on organic production typically turn positive in the third or fourth year. Don't lose sight of the potential returns in the future during the initial years of negative cash flow. The Organic Grain Compass will help you to see the results of your transition decision making going out ten years. Once you get these annual cash



Photo: Harriet Behar

¹OGRAIN maintains an online Organic Grain Resource List with buyers, sellers, suppliers and more at <https://ograin.cals.wisc.edu/>

flow estimates, it is helpful to calculate the internal rate of return (IRR) resulting from the change in production.

Keep variable costs low on transitioning acres. Variable costs are all the costs that you wouldn't have if you weren't growing any crops. They include seed, soil amendments, fuel, crop insurance, operating interest, and the costs of harvesting, hauling, and drying crops. These are all cash costs that must be paid during the year, as opposed to an overhead cost such as depreciation that doesn't require the farmer to write a check. Consider ways in which those cash costs can be minimized on transitioning acres. For example, the variable costs to grow hay are roughly 2/3 of the variable costs of growing corn in the first year of the transition. Many transitioning farmers find the cash flow easier to handle if they grow a crop like hay that requires lower out-of-pocket costs. By taking four to seven years to transition your acreage field by field and using hay as a primary transition crop, you will lay the foundation for a stable long-term crop rotation while lessening the negative impact of transition on your bottom line.

Timeliness is especially critical in organic production. Organic crops are particularly dependent on the weather. A grower may find that there are limited days where conditions allow for rotary hoeing or cultivating, and every acre of organic ground must be covered within that narrow window. Organics won't be a good fit for someone with an off-farm job that requires travel or long hours away from home and doesn't allow flexibility to perform timely farming activities. It may require investment in larger equipment that can cover more acres in a shorter timeframe. It may be harder to find custom operators to help with planting or harvest, which might also lead to more machinery investment. On the other hand, a diverse crop rotation can also spread the critical aspects of planting and weed management for the different crops over a longer time span.

You may encounter insurmountable hurdles that thwart your plans. While many farmers make the transition very successfully, more than one organic grower has been forced back to conventional row-cropping by a challenging nemesis such as giant ragweed. The cash flow squeeze tends to tighten the further you move down the timeline towards certification, and it could crush you before you get there. Careful planning, slowly learning successful methods, paying attention to details and anticipation of cash flow reality will help prepare for surprises and can make the difference between transition success and failure.

Get expert advice. Growers in the upper Midwest are lucky to have some excellent resources close at hand. The Organic Grain Resource and Information Network (OGRAIN, <https://ograin.cals.wisc.edu/>) was created in 2015 specifically to help conventional grain growers transition to organic. An annual two-day OGRAIN conference in Madison at the end of January every year focuses entirely on issues



Photo: Harriet Behar

specific to organic grain production. Both the Midwest Organic and Sustainable Education Service (MOSES) <https://mosesorganic.org/> and OGRAIN offer field days and a mentoring program. MOSES hosts the largest organic farming conference in the country every February in La Crosse, Wisconsin. Finally, there are many experienced growers in the Upper Midwest who have successfully transitioned and are willing to help others make the switch. The OGRAIN listserv is a great way to connect with them.

There is cost-sharing available. The USDA Natural Resources Conservation Service (NRCS) offers organic transition cost-sharing for a variety of practices through its Environmental Quality Incentives Program (EQIP) grants. Talk to your local NRCS staff and get on their list of farmers to contact when an EQIP signup is announced. The cost of organic certification is cost-shared through the USDA Farm Service Agency. Some states offer assistance with organic transition through their state departments of agriculture. It's worth a call to your state department to see if they have an organic assistance program.

The transition to organic grain production takes time, and cash flow may be negative for a few years. Get your lender on board with your plans early in the process. Keeping variable costs low and taking advantage of cost-sharing opportunities will help. There can be some challenging times on the road to certification. A grower who starts the process thinking of it as a long-term investment will likely see their perseverance rewarded.

Overall financial planning for the transition to organic grain production

There are three big questions to answer when considering the financial aspects of a transition to organic grain production:

1. Is the transition economically feasible?
2. Will there be enough cash flow to maintain the farming operation during the transition?
3. Is the transition a wise investment of time, labor and money?

This guide and its corresponding spreadsheet are intended to help aspiring organic grain farmers answer these three questions. The feasibility question can be answered by entering your numbers and estimates into the Organic Grain Compass. The cash flow question can be answered by developing month-by-month cash flow projections. The wise investment question can be answered by calculating something called the “internal rate of return.” We will explore each of these in the remainder of this publication.

Organic Grain Compass: Is this economically feasible?

The Organic Grain Compass electronic spreadsheet is in essence a collection of mini feasibility studies for various crops that might be grown. Looking at the costs and incomes of each specific crop, essentially crop enterprise budgets, allows you to determine whether you can make money in a particular enterprise. The collection of crop budgets brought together in the Organic Grain Compass allows you to explore the total economic impact of various crop rotations and ultimately, what an economically successful transition to organic might look like.

Enterprise budgets for grain operations are typically calculated on a per-acre basis. However, they can be calculated in whatever manner makes the most sense to you. Livestock producers often calculate their enterprise budgets on a per-head basis. A small-scale vegetable grower may budget on a per-bed or per-row basis.

Whatever basis is chosen to calculate enterprise budgets, they all start with the expected gross revenue. For a conventional corn enterprise, this might look like: *200 bushels per acre x \$3 per bushel = \$600 per acre*. If there are other revenue sources such as government payments or income from straw, those must be included.

Next, we plug in all the costs. These must first be sorted into two broad categories: 1) direct (also often called “variable”) costs; and 2) overhead (often called “fixed”) costs. Direct costs are expenses that can be attributed directly to a specific enterprise. They are costs you wouldn’t have to pay if you weren’t growing anything. They include seed, soil

TOOLS USEFUL BEYOND TRANSITION

While this publication and the Organic Grain Compass were planned primarily for operations planning organic transition, any organic or non-organic farmer will also find the tools useful in making financial projections about potential future rotations and cropping decisions.

amendments, custom harvesting, etc. Often these are expenses that you write checks for during the growing season.

Overhead costs are costs that will be incurred whether a crop is being grown or not. Some overhead costs are annual cash expenses such as property taxes, interest on a farm mortgage, or a bill for the farm's property and casualty insurance.

However, there are also some large overhead costs that aren't paid out of the farm's checking account, items such as depreciation or the value of the farmer's labor. These are real costs even if you aren't writing out checks to cover them. Machinery and buildings are depreciating every year and will eventually need to be replaced. That's an annual cost even though the bill won't come due until some year in the future.

A calculation for the cost of your labor must be put into your crop budget. You could go to town, get a job, and earn a paycheck if you weren't farming. The value of the farmer's labor—what you might be able to earn at a job in town—is considered to be the opportunity cost of being a farmer. Your labor is valuable, and you need to include that value as an overhead cost in our enterprise budget. A well-known ag economist once said, "If you as a farmer put zero value on your labor, then don't complain when you earn zero for your labor!"

Now that we've explored the concepts behind the numbers that must be collected and entered into the Organic Grain Compass, let's walk through each tab in the spreadsheet tool step by step.



Photo: Ruth McNair

Developing an in-depth feasibility plan for the transition

The discussion in this section of the publication is a direct companion to the downloadable spreadsheet tool, Organic Grain Compass, which can be found at <https://ograin.cals.wisc.edu/resources/ograin-compass>. The following discussion presents an overview of the information needed for each tab of the Compass. This is supported and elaborated on by very specific instructions in a User Manual on the first tab of the tool.

The Organic Grain Compass is designed as a guide in making reasonable estimates about potential future costs and incomes of various crop rotations mandated in organic production. Exploration using the tool by entering numbers for different crop choices will help you understand the potential economic impacts of specific decisions.

Crop planning

The transition to organic grain production is a journey that will last for years. The first step is to sketch out year-by-year crop scenarios for your farm. What crops do you plan to grow each year? How many acres of each crop will you grow? Which acres of those crops will be in transition and which will be certified organic?

Resources at the end of this publication can help you understand the various considerations that go into your decisions about these issues. Your choices will lead to how you set up your transition scenario(s) in the Organic Grain Compass. Below is an example of one transition showing four fields. (Note when looking at the chart below that the transition time is 36 months from last application of a prohibited substance to the harvest of the first organic crop. All prohibited substances—synthetic fertilizers, synthetic herbicides, unapproved for organic pesticides, fungicides, including seed treatments—must have been applied before mid-June for the crop three years later to be approved at harvest in late June.)

Table 1. Transition production plan.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Field 1	Conv Corn	Conv Sb	Conv Corn	Trans Oat	Trans Alfalfa	All fields organically certified
Field 2	Conv Sb	Conv Corn	Trans Oat	Trans Alfalfa	Organic Corn	
Field 3	Conv Corn	Trans Oat	Trans Alfalfa	Organic Corn	Organic Sb	
Field 4	Trans Oat	Trans Alfalfa	Organic Corn	Organic Sb	Organic Oat	

Conv=conventional; Trans=transitional; Sb=soybean.

Sample organic transition crop rotation, Craig Chase, Iowa State University, "Making the Transition from Conventional to Organic," 2009

Yield and price

As part of your crop scenarios you need to make some assumptions about potential per-acre yields. While many long-term organic farms see crop yields on par with conventional yields in their area, during transition, weed pressure is likely to be high, especially if the previous year was a row crop, and soil quality and crop yields are likely to be lower than they will be once they're certified organic. After certification, you must predict an average or base yield, and then project low and high yields as a way to estimate your likely profit depending on the type of growing conditions you might encounter.

The final piece of your crop scenarios is to make assumptions about the prices you'll receive for your crops. The prices expected during transition are going to be much lower than the prices received for certified organic crops. Hopefully, you can garner prices that are higher than conventional crop prices, possibly finding a non-GMO market. You will project low, base and high prices after certification. Organic prices tend to vary widely compared to conventional crop prices.

Crop expenses

In thinking about crop expenses, the direct costs paid to grow and harvest a crop generally come to mind. Some of those costs are incurred pre-harvest: seed; soil amendments; crop insurance; and the costs of operating machinery used to prepare the soil, terminate cover crops, plant the crop, and control weeds. Some costs are incurred at harvest time: combining; hauling crops out of the field; and possibly raking, shredding, baling, stacking, and hauling straw or stalks. This is where the value of all your labor (paid and unpaid) is accounted for. A further direct expense is either the real estate taxes paid on owned land or cash rent paid for leased land.

As with the crop scenarios, you first want to make assumptions for the transition years. Crop expenses could be higher or lower during transition than they will be after organic certification. For example, a farmer might be reluctant to pay for expensive organic soil amendments when she isn't capturing organic premium prices for her crops. On the other hand, it may take longer and cost more to cultivate corn during transition than it will after the farmer has gained more experience in the art of cultivation.

After the transition phase, you'll make assumptions about crop expenses once you've achieved organic certification. There's no such thing as an average year in farming; that's why the term "base" is generally used instead of average. Base costs are what you might expect to pay in a normal year. Then make assumptions about low and high cost years.

Crop gross profit

Reflecting numbers you've entered so far, the crop gross profit summarizes how much income to expect per acre. Crop expenses tally up

ESTIMATING ORGANIC YIELDS AND PRICES

While each farm and year will be unique, yield and price estimates to build projections must come from somewhere. Information from your farmer network will be invaluable, but there are also more formal sources of generalized data to draw from.

Organic commodity price histories are available from the USDA AG Marketing Service <https://www.ams.usda.gov/market-news/organic>.

FinBin is a large database of financial information, including organic farms, where you can explore what other farm's historical costs of production and yields have been. Created and managed by the University of Minnesota Center for Farm Profitability, find it at <https://finbin.umn.edu>.

ORGANIC CROP PRODUCTION ENTERPRISE BUDGETS

Those just starting out may struggle with figuring out costs of production. Sample organic crop production budgets available from Iowa State University offer sample numbers. You can use these as a reference, but be careful, as your actual numbers may be very different.

<https://www.extension.iastate.edu/agdm/crops/html/a1-18.html>

the direct expenses incurred per acre. Crop profitability is simply a subtraction of the expenses from the income to give estimates of the net income per acre after paying cash expenses for all of the different scenarios you've laid out.

It's important to note that the total numbers shown here in the "Crop gross profit" tab are just estimates of profits; they aren't the bottom-line profit, nor are they summaries of cash flow. There are some important financial pieces that haven't yet been considered. For example, depreciation costs for equipment, vehicles, grain bins, machine sheds and other investments being used on the farm haven't been looked at. We haven't included the expenses that can't be directly tied to a particular crop...things such as the farm's property and casualty insurance costs and its utility bills. We haven't plugged in the value of the farm owner's labor, which needs to be subtracted from net income before calculating profitability ratios such as rate of return on assets and rate of return on equity. We'll be looking at all of these additional factors in the next few tabs of the Organic Grain Compass.

A crop profitability estimate gives a good sense of whether you're likely to make money on the crops you intend to grow. It tells you if you should move forward with a deeper analysis.

Equipment

Equipment costs are a bit more challenging to allocate than is a cost such as seed corn. Under crop expenses, you allocated an estimate of the operating and labor costs for machinery. However, one of the biggest machinery costs is depreciation. Most machinery loses a little bit of value every day it sits on the farm. If it's used a lot, or operated under rough conditions, it can lose a lot of value.

The Internal Revenue Service (IRS) recognizes that depreciation is a real cost of operating a farm. It allows farmers to write off depreciation expenses each year and reduce their annual tax liabilities even though depreciation is not an expense that farmers have to pay in cash. The IRS even allows farmers to take a depreciation write-off of 100% of the cost of a piece of equipment in the year it's purchased, depreciating its value all the way down to zero in less than a year.

The IRS depreciation rules are great for tax planning, but the depreciation expense that appears on a farmer's tax return tells us nothing about the farm's true annual depreciation costs. You need to ignore tax depreciation and instead use economic depreciation in your financial planning.

Economic depreciation is simply a way of estimating how much value a piece of equipment loses each year you own it. Start with the market value of the item today. Then apply a depreciation percentage to that value. Typically, it's estimated that equipment depreciates 10-15% each year. If it's kept in a shed and is well-maintained, it'll be at the low end



Photo: Ruth McNair

of the range. If it sits outside and is run over rocky fields, annual depreciation will be higher.

The annual depreciation rate is often called the “capital asset recovery” or “capital asset replacement” (CAR) rate. The depreciation charge is either a way of recovering the capital investment tied up in the equipment asset, or it’s seen as a way of allocating dollars to replace equipment when the time comes to get rid of it and buy something new.

Start by making a list of the equipment that is already owned at the beginning of the transition to organic along with fair market values for each piece. You then must decide what CAR rate to apply each year that you will continue to own it. Since you’re planning for a number of years, you want to predict what year you intend to sell a particular piece of equipment and what it will likely be worth at that point. You don’t want to forget to budget for the cash the farm will receive during the year of the sale.

As you transition to organic, there may be pieces of equipment that you intend to buy along the way. Just as you budget for cash coming in from future sales of equipment, you want to budget for cash you’ll need in future years to buy equipment. Also, once it’s been purchased, you’ll need to start depreciating new equipment by applying the CAR rate to its fair market value.

Buildings and infrastructure

Just as you had to overcome the challenge of allocating machinery costs over various enterprises and over a number of years, you need to do the same with buildings, grain bins, fuel tanks, and other infrastructure improvements on the farm. Buildings and infrastructure depreciate too, although typically at a slower rate than machinery.

The process of calculating economic depreciation for buildings and infrastructure is very similar to machinery. Start with a list of all of the buildings, bins, and other improvements that are owned today, along with estimated market values of each. It can be difficult to come up with a market value for something like a building that you can’t just pick up and take to an auction. You might consider using the same value you’re using for insurance purposes, or something close to that value. When a building is valued for insurance purposes, the value of the land under the building, which is not depreciable, has been excluded.

After you’ve got a list of all the buildings and improvements at the start of transition, you need to apply a CAR rate. The CAR rate applied to buildings is less than the CAR rate applied to machinery. Typically, a 5% CAR is used for buildings and grain bins. A higher CAR might be used for items that depreciate at a faster rate, such as a grain dryer, or the same rate can be used. Again, by applying the CAR rate you’re

EXPLORING CAPITAL ASSET RECOVERY IN MORE DETAIL

For a longer discussion of capital asset recovery, including a chart of various rates related to prevailing interest rates, visit the publication *Estimating Farm Machinery Costs* by Iowa State University <https://www.extension.iastate.edu/agdm/crops/pdf/a3-29.pdf>

estimating how much market value you're losing each year that the building, bins and other improvements are being used.

Once the economic depreciation of buildings and infrastructure at the beginning of the transition have been accounted for, we turn our attention to future planning. What sort of infrastructure do you intend to add in the future? In which years will you add infrastructure? How much cash will you need to carry out your plans and when will you need it? When infrastructure is placed in service, start applying a CAR rate to it.

Farmer financials

Income statements and statements of cash flows are considered to be whole farm financial statements; they look at the financial performance of the entire farm as one big unit rather than as a series of individual cropping enterprises. Both of these statements are annual summaries of the farm's financial performance. They won't tell anything about how the farm is performing at various times of the year.

Income statement

The top two charts on the "Farm financials" tab create a basic farm income statement. An income statement helps calculate the net return generated by operating the farm. This isn't telling how much cash should be in the farm checking account at year-end. An income statement includes a number of items that don't impact the cash position, such as changes in crop inventories from one year to the next, and changes in accounts receivable (owed to you) and accounts payable (you owe). All three of these items add to or subtract from the farm's net income even though the impact isn't felt in cash.

The farm's income statement includes the interest paid on farm loans but not the principal payments. To understand why, think of interest as rent. If you borrowed a piece of equipment from a dealer, you'd pay a rental fee and give the equipment back when you're done using it. If you borrow money, you pay interest as rent for the use of the funds and give the principal back to the lender when you're done using it.

The income statement includes the dollars of economic depreciation—capital asset recovery—calculated for machinery, buildings and improvements as an expense even though it isn't a cash expense.

Statement of cash flows

The statement of cash flows is an annual rollup of all the cash that came into the farm during the year and all the cash that went out. The difference between cash that came in and cash that went out should be equal to the change in the farm's cash accounts. If you started the year with \$1,000 in the farm's checking account, and the difference between cash in and out during the year was +\$5,000, you should have \$6,000 in the checking account at the end of the year.



Photo: Ruth McNair

Cash flow is broken into three sections on the statement of cash flows: 1) Cash from operations; 2) Cash from investing activities; and 3) Cash from financing activities. Cash from operations (condensed in the Compass to one line “Cash Profit before Asset Recovery”) is simply all of the cash that came in during the year from sale of farm products, custom work, government programs or other farm operating activities, minus all cash farm operating expenses.

Cash from investing activities refers to capital investments made in the farm operation or capital items sold. It doesn't include the investment you made in Cousin Bob's Alaskan gold mine. If you use cash to purchase a piece of farm equipment, you'll show cash leaving the farm. If you sell a piece of equipment, you'll show the cash you received for it as coming into the farm.

Cash from financing activities is a bit more nuanced. It includes cash received from loan proceeds as cash flowing in, and loan payments as cash flowing out. However, it also includes non-farm income as cash inflow from financing activities. Off-farm income is considered a potential source of cash if the farm needs it. Think of this as a loan to the farm from an off-farm job. When you take money from the farm to cover family living expenses or to pay yourself back for the money you just loaned to the farm from your off-farm job, consider that a cash outflow under cash flow from financing activities.

Further discussion

Entering your own calculations into the Organic Grain Compass allows you to view the cash flow and net income of your operation as you make different decisions. Modifying crop scenarios in the “Crop planning” and “Yield and price” tabs will determine the overall incomes and expenses you can predict into future years based on expected yields and prices.

However, the unexpected often happens, with costs or prices other than you expect or weather events impacting yields and the market beyond what has been planned. This tool may not exactly predict your future, but it can give you a rough idea of financial outcomes for one set of decisions compared to another set of decisions. While neither might happen, the relative impacts should be more or less the same if you have tried your best to make accurate estimates.

As useful as the Organic Grain Compass can be, it isn't the end of the story. This collection of enterprise budgets only tells us how much profit we can possibly generate by the end of each year. It doesn't tell us anything about our cash flow *during* the year. With most crops, the seed and other crop expenses have to be paid early in the year but the income doesn't show up until after harvest. How are you going to pay the bills each month while you're waiting to harvest crops? You need a cash flow projection to answer that question.

Beyond the Compass: Month-by-month cash flow projections

After entering information into the Organic Grain Compass and deciding that it makes sense to move forward with the transition to organic, the next step is to expand your budget into a month-by-month cash flow projection.

Most cropping expenses will have to be paid early in the year, but income from crops won't be received until late in the year or possibly in the following year. A month-by-month cash flow projection helps figure out when cash is coming in and when it's going out. It encourages planning on how to survive in the months when a lot more cash is going out than coming in.

There is a simple month-by-month cash flow spreadsheet template you can enter your own numbers into at <https://ograin.cals.wisc.edu/resources/ograin-compass>.

Start the month-by-month cash flow by entering the farm's cash balance on January 1 as starting cash for the year. Then plug in the amount of cash you expect to receive each month of the year. Cash can come from the sale of grain or other farm products, custom work, sale of capital assets, government payments, and non-farm income.

Next, estimate how much cash is going to go out each month of the year for operating expenses. It's generally simplest to use the expense categories found on Schedule F of your annual federal tax return. Finally, add any loan payments in the months they are due, any planned capital purchases, and a cash draw each month for family living expenses.

For each month of the year, you want to see how much cash you had at the beginning of the month, how much came in during the month, how much went out, and what you had left at the end. The ending balance for January becomes the beginning balance for February, and so on.

After completing the cash flow for the entire year, look for the months when the ending cash balance is projected to be negative. How are you going to get through those months? Maybe you're going to tap a farm operating loan. Maybe you'll sell crops in different months than originally intended. Maybe you'll put off planned capital purchases. Maybe you'll try to cut operating expenses. Maybe you'll increase non-farm income. Being able to predict those months when cash is short allows you to plan ahead rather than going into crisis mode when the checking account is empty and there are still a pile of bills to pay.

PROFITABILITY VERSUS CASH FLOW

Profitability tells if the farm operation is giving an adequate return on the investment of money, time and labor. Cash flow tells if enough cash is coming in each month and each year to meet all the demands on cash.

Demands on cash include operating expenses, loan payments, income taxes, family living costs, replacement of machinery and buildings as they wear out, and building up cash reserves in order to persevere through tough economic conditions.

Transitional Corn Cash Flow Projection													
	January	February	March	April	May	June	July	August	September	October	November	December	TOTALS
BEGINNING CASH	\$30,000	\$28,450	\$27,400	\$26,350	\$83,100	\$40,250	\$39,000	\$38,450	\$28,400	\$28,350	\$28,300	\$29,550	
CASH IN-FLOW													
Livestock income											207,200		207,200
Crop income													0
Government payments													0
Crop insurance proceeds													0
Custom work income													0
Sales of capital assets													0
Proceeds from new loans				130,800									130,800
Off-farm income													0
Other income													
TOTAL CASH IN	\$0	\$0	\$0	\$130,800	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$207,200	\$338,000
CASH OUT-FLOW													0
Livestock purchases													0
Car and truck expenses	50	50	50	50	50	50	50	50	50	50	50	50	600
Chemicals													0
Custom hire											22,000		22,000
Feed													0
Fertilizer & lime					40,000								40,000
Fuel & oil					1,600								1,600
Insurance	500						500	10,000					11,000
Labor hired													0
Rent of machinery & equipment													0
Land rent				40,000							40,000		80,000
Repairs & maintenance	1,000	1,000	1,000		1,200	1,200					500	1,000	6,900
Seeds & plants				34,000									34,000
Supplies													0
Property taxes													0
Utilities													0
Vet & breeding													0
Hauling & drying											8,000		8,000
other expenses													0
OPERATING OUT-FLOW	1,550	1,050	1,050	74,050	42,850	1,250	550	10,050	50	50	70,550	1,050	204,100
Capital purchases													0
Principal and interest payments											135,400		135,400
Family living draw													0
TOTAL CASH OUT	1,550	1,050	1,050	74,050	42,850	1,250	550	10,050	50	50	205,950	1,050	339,500
ENDING CASH	\$28,450	\$27,400	\$26,350	\$83,100	\$40,250	\$39,000	\$38,450	\$28,400	\$28,350	\$28,300	\$29,550	\$28,500	

Sample cash flow courtesy Paul Dietmann, Compeer Financial, 2018

One more question to consider: Is the transition to organic a wise investment?

The transition years can be difficult, especially if you have not planned wisely. Cash flow on transitioning acreage may be marginal or negative for three years. You can expect that the cash flow will be much more positive once you've achieved organic certification and can sell at an organic price. While careful management of crop rotations and gradual farm acreage transition can help blunt the financial effect, can you justify three years with lower than average income?

It helps to look at the transition to organic as a long-term investment. When you make an investment, you expect the reward to come in the future. If you work off-farm and decide to put money into a retirement account, you expect cash flow to be reduced for a number of years. Money is taken out of your paycheck every month and your cash inflow is lowered. You don't expect to get that money back next month, next year, or perhaps even in the next twenty years. You expect the investment to grow over time and begin providing cash flow back many years in the future.

While we can compare the predictive results we see in the Organic Grain Compass spreadsheet, another useful tool using the information you've collected can help determine whether organic transition is a wise investment. Transition can be analyzed like any other capital investment, by calculating the internal rate of return. This is not incorporated in the Organic Grain Compass but is an additional calculation you can use to compare one set of decisions to another.

Internal rate of return (IRR) is a powerful tool commonly used by savvy investors to decide how to allocate their cash. They want to make sure their dollars are being deployed in a way that's likely to give them a strong IRR. Often, they will set a hurdle rate, or a minimum IRR they will accept on investments they make. If a given investment doesn't pass the hurdle, they'll consider another use of their money instead. You can do the same when considering the economic impact of an organic transition.

Let's go back to the retirement account example for a moment. If the account is expected to grow at a predictable annual percentage rate, you can apply that rate to calculate the compounded earnings on your invested dollars and estimate how much more cash you will have in the future.

In calculating IRR, you predict how much cash you will receive in the future and calculate how much you have to discount those future dollars to make them equal in value to your initial cash investment. The discount rate calculated is the internal rate of return on the investment. Calculating the future value of today's dollar is called



Photo: Anders Gurda

“compounding.” Calculating today’s value of a future dollar is called “discounting.”

Calculating the IRR on any investment is done with three pieces of information. First, the initial cash outlay for the investment. Second, a projection of the annual net cash flow for each year that the investment will be in place. Finally, how much cash will likely be recouped when exiting the investment.

Back in the old days, this information was plugged into equations, and a lot of time was spent hand-calculating the IRR. Now, you can input the numbers into a computer spreadsheet or an app on your phone and have the IRR in a matter of seconds.

Here is a very simple example of an IRR calculation for a transitional organic farm. Let’s say the farm has a beginning machinery investment of \$500 per acre. There is no debt against the machinery, so the initial cash investment is \$500 per acre. Cash flow projections show that the farm will experience a cash loss of \$125 per acre (-\$125/acre) for three years during the transition. It projects a \$550 net cash income in the years following certification. Running our scenario for five years with a CAR of 15%, at the end the value of the machinery will have depreciated to \$222 per acre.

Three pieces of information are needed to calculate the IRR:

1. Initial cash investment: \$500 per acre
2. Annual cash flow: Years one, two and three (-\$125/yr); years four and five +\$550/yr.
3. Ending cash value of machinery in year five: \$222

Plugging this information into an IRR calculator, the IRR is 11.54%. Running the calculation for one additional year at \$550 net cash income and machinery depreciated to \$189/acre, the IRR increases to 18.91%. Even if the machinery depreciated to zero by the end of year six, the IRR would still be 16.37%.

So, how do you feel about having a return on your investment into an organic transition of 11.54%, in this most conservative scenario? This seems like a pretty good use of your land, investments in seed, machinery, your own labor and other inputs. Calculating the IRR for your transition, and considering various transition scenarios, allows you to compare in very real terms how the financial aspect of a transition to organic might compare to other production decisions you might make.

For more on IRR, see Chapter 14 of the book *Fearless Farm Finances: Farm Financial Management Demystified* listed among the resources at the end of this report.

INTERNAL RATE OF RETURN CALCULATION

We have loaded a simple IRR spreadsheet calculator at: <https://ograin.cals.wisc.edu/resources/ograin-compass>

EZ Calculators offers a downloadable IRR calculator app for your phone at <http://www.fncalculator.com/>

Final notes

This discussion is a companion to the Organic Grain Compass spreadsheet (see the screen shot of the Compass on page 19), available at <https://ograin.cals.wisc.edu/resources/ograin-compass/>. More detailed instructions in that form will help you select and insert numbers, offering estimates of how the financial picture will change given different choices you can make.

It is important to be as realistic as possible when choosing numbers to enter in projections. Unrealistic hopeful wishes might look good on paper but are useless when you are going to a lender or trying to pay your bills in a few years.

A realistic view of where you will market your product is essential for the accuracy of the transition calculator and your farm's financial success. Discovering potential markets will take some time as you plan potential crop rotations and your overall transition scheme.

Once you have inserted your own numbers and estimates into the Organic Grain Compass spreadsheet, you can play with a diversity of options and choose the crops and rotations that will best serve your needs and create the strongest income balance.

While crop rotations are mandatory in organic production, they are also essential to weed and disease control and soil fertility and must be planned carefully for full benefit. Outside factors might also influence why you may choose a particular crop or rotation. Perhaps there is a need for a specific feed crop on your farm, or you don't yet have the equipment needed for another. In the long run, you must focus on overall farm and soil sustainability over short term single crop profits. For more on the benefits of diverse crop rotations, see the resources at the end of this publication.

As you fill in estimates for incomes and expenses, recognize that various fields can have significantly different yield potential or cost structure. The profit potential on a flat piece of rich farmland that is owned without debt against it will be much different than a hilly, rocky piece of cash-rented land. You want to use the Organic Grain Compass to make good financial decisions. The more precise you can be, the better.

Note that the economics of each grain crop will be quite different and will vary from year to year even for the same crop. As in all farming, an operation planning diverse rotations can expect fluctuation of profitability from crop to crop and year to year. Some farmers choose greater diversity, with more rotations on smaller fields, to offset market variability of specific crops and better balance overall farm income each year. As you move farther into organic production you will find the production system that works best for your operation and your financial needs. The Organic Grain Compass is designed to show you income potential over a ten-year period. Averaging years with high



Photo: Anders Gurda

production or a high-income crop in rotation with lower years or lower income crops will leave you with the overall view of the economies of a fully functioning organic system.

While the Organic Grain Compass is designed to be useful as a one-time planning tool for farmers assessing the outcomes of transitioning to organic, ongoing use of the tool as a transition unfolds will also offer valuable information. The Compass should be reviewed frequently and updated as prices change. The information can be very helpful in making purchasing or marketing decisions, or when deciding how many acres to devote to various crops.

Specific tabs, such as “Equipment” and “Buildings and infrastructure,” may stay more or less static and can be added to as needed. Other tabs can be changed as new decisions are made and a crop history created. Update your budgets annually, replacing projections with actual numbers to both see how close your estimates were and solidify your records going forward. Comparisons of predictions to actual outcomes as your farm history is recorded will help you see where your assumptions were accurate or not, and help you modify predictions to make better assessments farther into the future.

Crop planning spreadsheet example from <https://ograin.cals.wisc.edu/resources/ograin-compass>

Resources

2018 Field Crop Budgets

Ontario Ministry of Crops and Agriculture, Canada, 2018

<http://www.omafra.gov.on.ca/english/busdev/facts/pub60.pdf>

Includes organic corn, soybeans, winter wheat, spelt, barley and oats. Note these are Canadian dollars, U.S. prices will undoubtedly differ.

eOrganic

541-737-3483

Department of Horticulture, Oregon State University, 2750 SW Campus Way, Corvallis, OR 97331

<http://eorganic.info> (community website)

http://www.extension.org/organic_production (public website)

The organic agriculture community of practice with eXtension: engaging farmers and ag professionals through trainings and publications and supporting research and outreach projects.

Fearless Farm Finances: Farm Financial Management Demystified

Midwest Organic and Sustainable Education Service, 2017

<https://mosesorganic.org/fearless-farm-finances>

Book with instructions, tips and tools for setting up and managing a farm's financial system.

FinBin

Minnesota Center for Farm Financial Management

800-234-1111, University of MN, 130 Ruttan Hall, 1994 Buford Avenue, St. Paul, MN 55108

<https://finbin.umn.edu>

Comprehensive, freely accessible database of financial and production data from thousands of farms, including organic.

IDEA Farm Network Listserv

309-824-7467, w.glazik@gmail.com

Google discussion group and regular meetings moderated by Illinois farmer Will Glazik.

Midwest Organic and Sustainable Education Service

715-778-5775, PO Box 339, Spring Valley, WI 54767

<https://mosesorganic.org>

Information, activities and resources for farmers interested in organic and sustainable production.

Minnesota Center for Farm Financial Management

800-234-1111, University of MN, 130 Ruttan Hall, 1994 Buford Avenue, St. Paul, MN 55108

<https://www.cffm.umn.edu>

Host of numerous financial tools, including business planning and grain marketing info.

National Center for Appropriate Technology (NCAT) (ATTRA)

800-346-9140, PO Box 3838, 3040 Continental Dr., Butte, MT 59701

<https://attra.ncat.org>

Source of information about sustainable agriculture for U.S. farmers and other agriculturists.

National Organic Program

202-720-3252, 1400 Independence Avenue SW, Stop 0268, Washington, DC 20250

<https://www.ams.usda.gov/about-ams/programs-offices/national-organic-program>

Official USDA website supporting the National Organic Rule, including a list of accredited certifying agencies.

OGRAIN

608-872-2164 or 608-890-1503, 593a Russell Labs 1630 Linden Dr., Madison, WI 53706

<https://ograin.cals.wisc.edu>

Resources and activities to support organic grain farmers.

Organic Crop Production Enterprise Budgets

Iowa State University, 2011

<https://www.extension.iastate.edu/agdm/crops/pdf/a1-18.pdf>

Online spreadsheets showing generalized numbers and allowing personalized input.

Organic Certification Cost Share Support

Iowa Department of Agriculture

515-281-7657, <https://www.iowaagriculture.gov/AgDiversification/organicCostShare.asp>

Minnesota Department of Agriculture

651-201-6134, <https://www.mda.state.mn.us/organic-certification-cost-share-program>

Wisconsin Department of Agriculture, Trade and Consumer Protection

608-224-5095, <https://datcp.wi.gov/Pages/Organic-Certification-Cost-Share-Program.aspx>

Practical Farmers of Iowa

515-232-5661, 1615 Golden Aspen Dr, Ames, IA 50010

<https://practicalfarmers.org/>

Field days, resources and events to help build resilient farms and communities.

Understanding Organic Pricing and Costs of Production

ATTRA, 2012

<https://attra.ncat.org/attra-pub-summaries/?pub=419>

12-page publication offering sources for pricing information.

USDA Ag Marketing Service

National Organic Grain & Feedstuffs Report

<https://www.ams.usda.gov/market-news/organic>

Weekly organic commodity price reports.

Glossary

Base cost, price or yield - what you might expect in a “normal” year

Capital asset recovery or replacement (CAR) - annual depreciation rate, a way of allocating dollars to replace equipment

Certification agency - a business or government agency accredited by the USDA to certify farms and businesses to the USDA organic regulations

Certification cost share - a USDA program providing reimbursements of up to 75 percent of annual organic certification costs, up to a maximum payment of \$750 per year per farm

Cover crop - crops planted in complement with cash crops to manage soil erosion, soil fertility, soil quality, water, weeds, pests, diseases, biodiversity and wildlife

Crop rotation - The practice of alternating annual crops grown on a specific field in a planned pattern or sequence in successive crop years so that crops of the same species or family are not grown repeatedly without interruption on the same field.

Economic depreciation - an estimate of how much value a piece of equipment loses each year

Enterprise budget - an analysis of specific incomes and costs related to a particular activity or enterprise

Green manure - a soil amendment of growing plants that are plowed back into the soil to provide fertility

Gross revenue - total income recognized for a reporting period, prior to any deductions

Income statement - a calculation of the net return generated by operating the farm in a given year, including cash and non-cash activity

Internal rate of return (IRR) - a calculation of how much you discount the future value of an investment to make it equal in value to your initial cash investment

Net cash flow - difference between a farm’s cash inflows and outflows in a given period

Non-approved or prohibited substance - a substance which is not allowed in any aspect of organic production or handling as outlined in the National Organic Program regulations

Operating capital - financial resources used for daily operations in a farm business

Organic system plan - the overall written annual plan, including crops, inputs and management techniques planned for an organic operation. Part of organic certification requirements

Overhead costs (also called fixed costs) - Costs that will be incurred whether a crop is being grown or not. Examples include property taxes, interest on a farm mortgage, the farm’s property and casualty insurance, utility bills, unpaid labor, depreciation.

Statement of cash flows - an annual assessment of all the cash that came into the farm during the year and all of the cash that went out

Synthetic fertilizers and pesticides - substances formulated or manufactured by a chemical process, or by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources

Transitional crops - crops that have been managed under organic practices but do not meet the time requirement for organic certification

Variable costs (also called direct costs) - costs that you wouldn’t have if you weren’t growing any crops. Examples include seed, soil amendments, fuel, crop insurance, operating interest, and the costs of harvesting, hauling, and drying crops.