US Organic Grain—
How to Keep it Growing

February 2019

Abstract

There are two primary typologies of U.S. organic grain farmers—those farms that grow 100% certified organic, which tend to be on the smaller scale relative to farms in their regions, and farms that grow a mix of organic and conventional, which tend to be mid- to large-scale relative to other farms in their region. Across these typologies of farmers, **three key challenges exist:**

1. **the risk associated with the high cost of transition and uncertain market guarantee at the end of the transition period;**
2. **maintaining and increasing soil fertility and weed suppression to optimize yields in the long term;**
3. **inadequate farm management resources.**

In this paper, we provide an overview of the state of U.S. organic grain, and drill into the dynamics of price as it relates to creating a stable alternative to conventional, highlighting the price sensitivity of the mid- to large-scale farmer. We also offer a **review of three industry solutions** needed to help farmers address the risks associated with the high costs of transition, price volatility and to address farm management challenges to optimize production. These are:

1. **Utilize different pricing mechanisms to address volatility, risk, and competitiveness;**
2. **develop markets for lower value crops that increase soil fertility and suppress weeds;**
3. **increase availability of trusted advisor networks and improved access to organic resources for farmers.**

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This report is an update of a study commissioned by the U.S. Organic Grain Collaboration back in 2014 on the U.S. organic grain sector. The U.S. Organic Grain Collaboration was formed that year to address the issue of the short supply of domestically grown organic grain, and to collaborate to develop strategies and tools able to be adopted by other stakeholders in the organic supply chain to improve the resilience of organic grain farmers and boost organic grain production. The U.S. Organic Grain Collaboration is now a project of the Organic Trade Association's Grain, Pulse and Oilseed Council, and its members are Annie's, Ardent Mills, Clif Bar, Stonyfield, Organic Valley, King Arthur Flour, and Pipeline Foods.

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Contents

Introduction

In 2014, a consortium of organic food and beverage brands convened to address organic grain supply, an identified bottleneck for value-added processes. Growth in grain production lags other organic commodities, and remains a negligible amount of total U.S. cropland. An informal group of companies commissioned the Sustainable Food Lab to provide a thorough review on barriers and challenges to organic grain production to address the situation. A literature review and key informant interviews were performed to inform the discussion. The resulting report, Barriers and Opportunities: The Challenge of Organic Grain Production in the Northeast, Midwest and Northern Great Plains, contains those findings and identifies the social, economic, educational, and research related interventions to increasing the supply of U.S. produced organic grain.

Following the completion of the report, companies decided that the scope of the challenge was great, and that collective action was required. The group formed the U.S. Organic Grain Collaboration, and has since worked together to share with value chain, NGO, and government partners the extent to which addressing the key system barriers requires investment.

2018 marks a reflection point on lessons learned after three years of working and learning together to increase domestic organic grain production. The primary risks for organic grain farmers identified in the 2014 paper persist, and are discussed in this paper along with new insights around factors impacting the growth of the industry.

As brands seek to expand their offering of organic products, the organic grains industry faces the challenge to ensure stable, profitable and environmentally sustainable growth. This begs the question: What are the minimum conditions needed to support more farmers to not only step into organic but also stay in organic?

Methodology

A scan of academic literature and interviews with key informants were undertaken to produce this paper. In-depth interviews with three organic grain growers, one organic grain handler, and one Extension agent were used to add qualitative depth to the data. Data was sourced from USDA and Mercaris Market Data. Further, this paper covers insights from an aid environment report commissioned by the Sustainable Food Lab (SFL) as well as the in-house knowledge and expertise of SFL staff. The research and interviews were limited to the U.S. Mid-West and Northeast.

US Organic Grain Production Overview

Total Production and Regions

In 2016, U.S. production of organic corn, soybeans, wheat, oats, and barley totaled 765,000 acres, producing 46 million bushels and generating $336 million in sales. The **top five organic grain producing states**—Montana, Iowa, Minnesota, Wisconsin, and Wyoming—represent roughly **39% of U.S. organic grain acreage**. See Figure 1. Another 17 states mainly in the Midwest and upper Great Plains each have at least 1% of the total organic grain acreage. Midwestern states tend to grow more corn and soybeans, and Great Plains states predominantly grow small grains such as wheat, barley, and oats.

Montana, Iowa, Minnesota, Wisconsin, and Wyoming, represent roughly

39% of US organic grain acreage

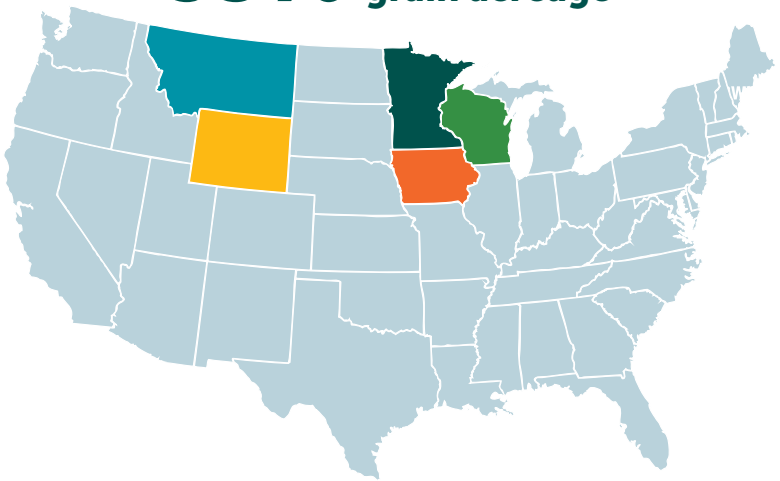
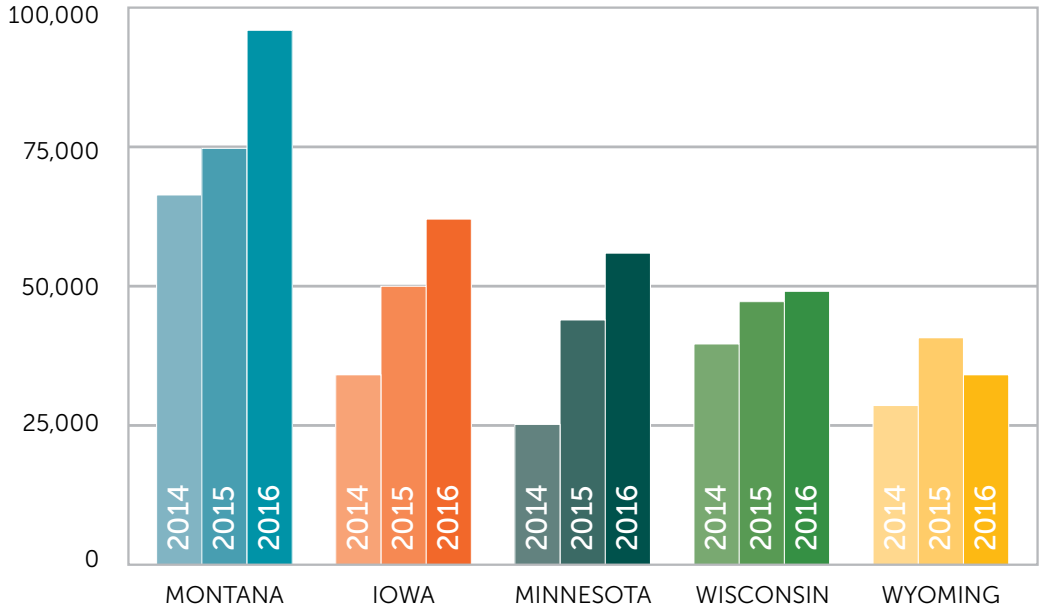


Figure 1: Acreage in organic grains, top 5 states, 2014—2016



Source: USDA NASS Quickstats Database

Farm Typologies

Organic grain acreage has historically come from farmers transitioning all or some of their conventional grain production acreage to organic. The motivations and rationale of transitioning generally vary according to farm size.

The "**Small" grain farms** often have a history of growing conventional grains or other products, and changed their business to compete in a farm economy that often demands ever-increasing scale. Rather than growing along with their competitors, these farms transition to organic production—almost always making a 100% transition. These farms tend to be on the smaller scale relative to farms in their region. Most of these farmers grow a mixture of four or more grain and legume crops in rotation, and tend to focus their marketing efforts on food-grade consumer markets, which afford higher premiums. These growers have generally found that organic production affords higher net margins, which enables farmers to meet their financial needs at a smaller scale compared to their conventional counterparts. Often the smaller farmers' motivations to transition to organic are not solely economic. During interviews, growers in this category also mention environmental and health concerns. These farmers tend to stay certified after the transition.

The **"Mid-Sized" grain farms** tend to be conventional grain farms that add organic production to their portfolios when they perceive a market need. These farms tend to be larger farms relative to other farms in their region. These growers see organic grains as an opportunity to hedge against the inevitable downturns in the conventional grain market. While these growers have the potential to add significant organic production, they also tend to be less likely to stay committed to organic production if they don't perceive it as profitable within a relatively brief time frame. This is discussed more in the pricing section below.

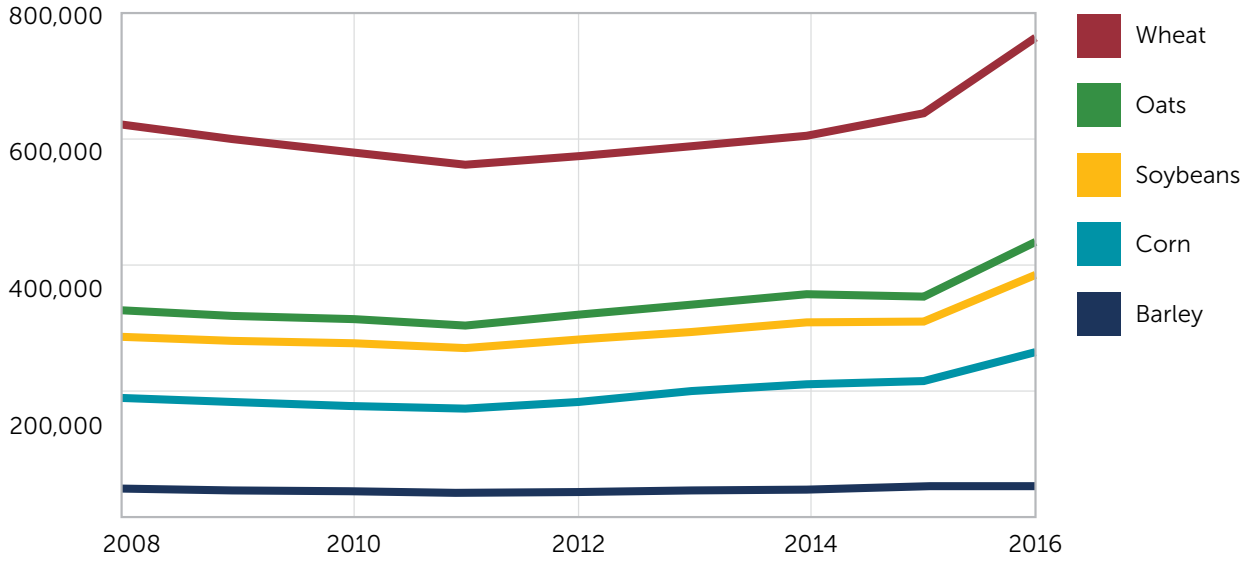
Very large grain farms are less likely to move into organic. These farms are heavily invested in the technology and equipment needed to manage conventional acres, and may not consider the benefits worth the costs of adding organic management. Some large investment-backed farm corporations, however, have financed large-scale conversion.

Growth and Demand

Organic grain production is growing, however not at a rate to meet the organic livestock industry needs. From 2008 to 2016, U.S. production of organic corn, soybeans, wheat, oats, and barley grew from 626,000 to 765,000 acres—a growth of 22% over the eight-year period. See Figure 2. Over a similar period, the U.S. livestock products industry—including dairy, meat, and eggs sold from farms to first handlers—increased from $1.2 billion to $3.3 billion, nearly 300% growth. See Figure 3. The growth of domestically produced organic grains and soybeans has not kept pace. While many organic farmers do not grow for the feed market, the gap between supply and demand can be attributed to the increase in demand from the feed sector.

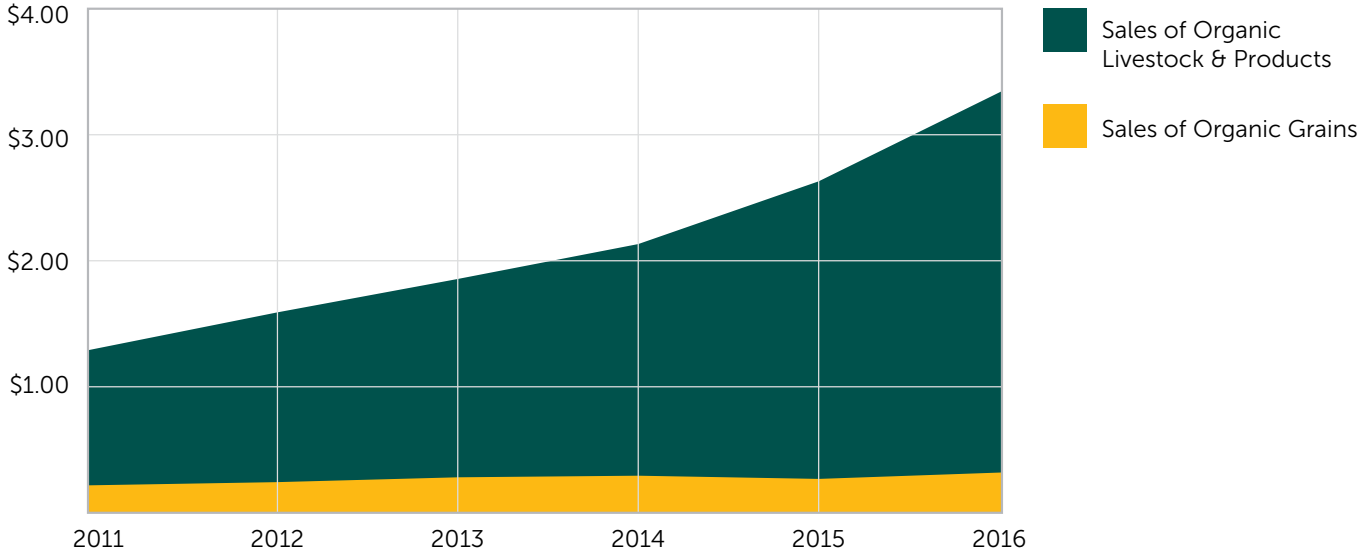
Organic grain **production is growing**, however **not at a rate to meet the organic livestock industry needs**.

Figure 2: US Organic Grain Acreage, 2008–2016



Source: USDA NASS Quickstats Database.

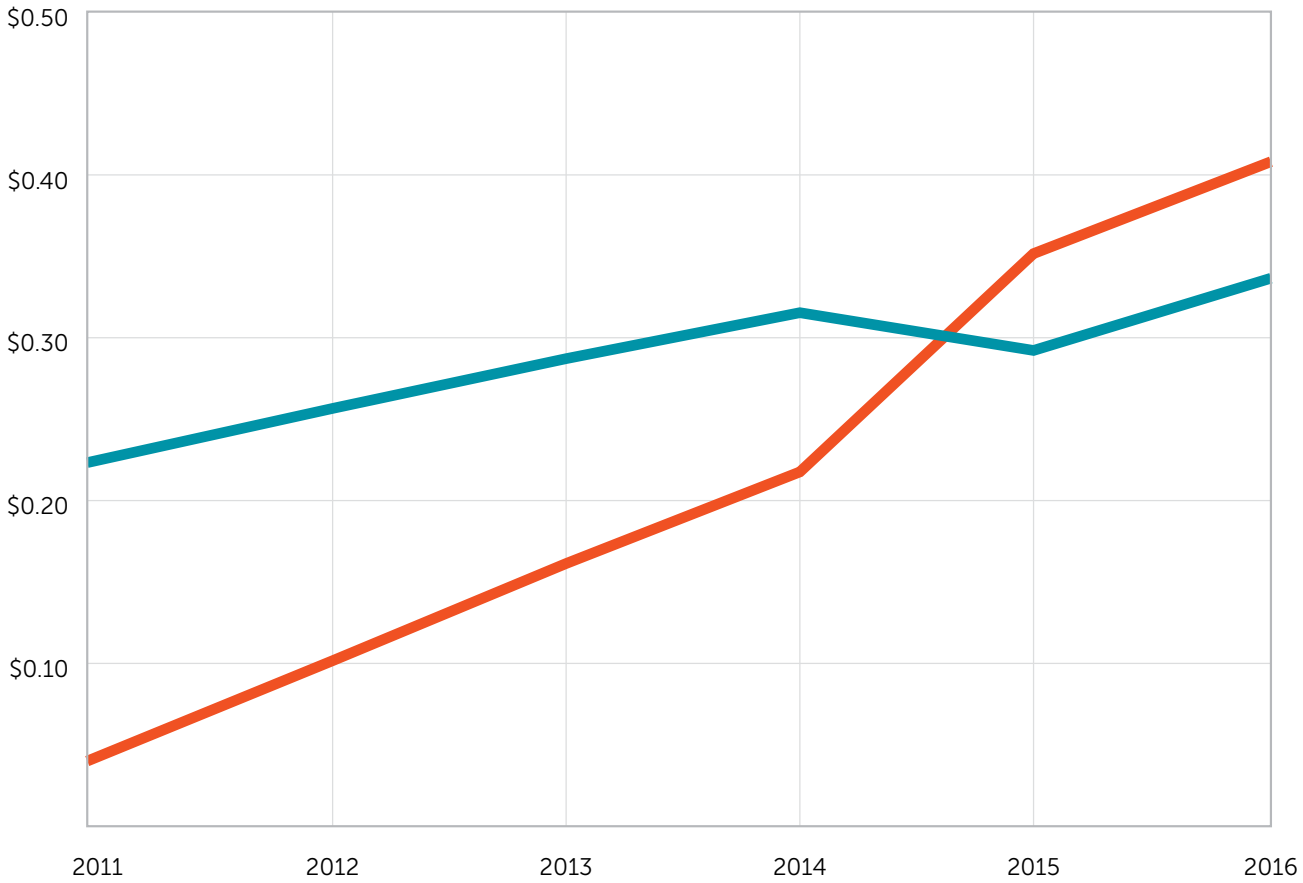
Figure 3: Growth of Organic Livestock Products Industry and Organic Grains (in billions)



Sources: USDA NASS Quickstats Database

Organic livestock producers have made up for this gap by **importing organic feeds**. Since 2011, the value of imported organic grains and soybeans has skyrocketed from $42 million to $401 million, a growth rate of x10. Imported organic grains and soybeans now exceed domestically grown grains and soybeans in the U.S. See Figure 4.

Figure 4: Domestic Organic Grains Sales and Imported Organic Grains Value (in billions)



Sources: USDA NASS Quickstats Database, USDA Global Agricultural Trading System Database

Over-reliance on imported organic grain and soybeans is both a missed opportunity for the U.S. farmer and a weakness recognized by all the major components of the supply system.

This **over-reliance on imported organic grain and soybeans is both a missed opportunity for the U.S. farmer and a weakness** recognized by all the major components of the supply system (organic livestock and food manufacturers): from the U.S. organic grain growers to the consumer brand companies whose products and pricing strategies ultimately depend on the integrity of organic certification. Despite the concern, efforts to increase domestic organic grain and soybean production have not kept pace with the demands of the livestock industry.

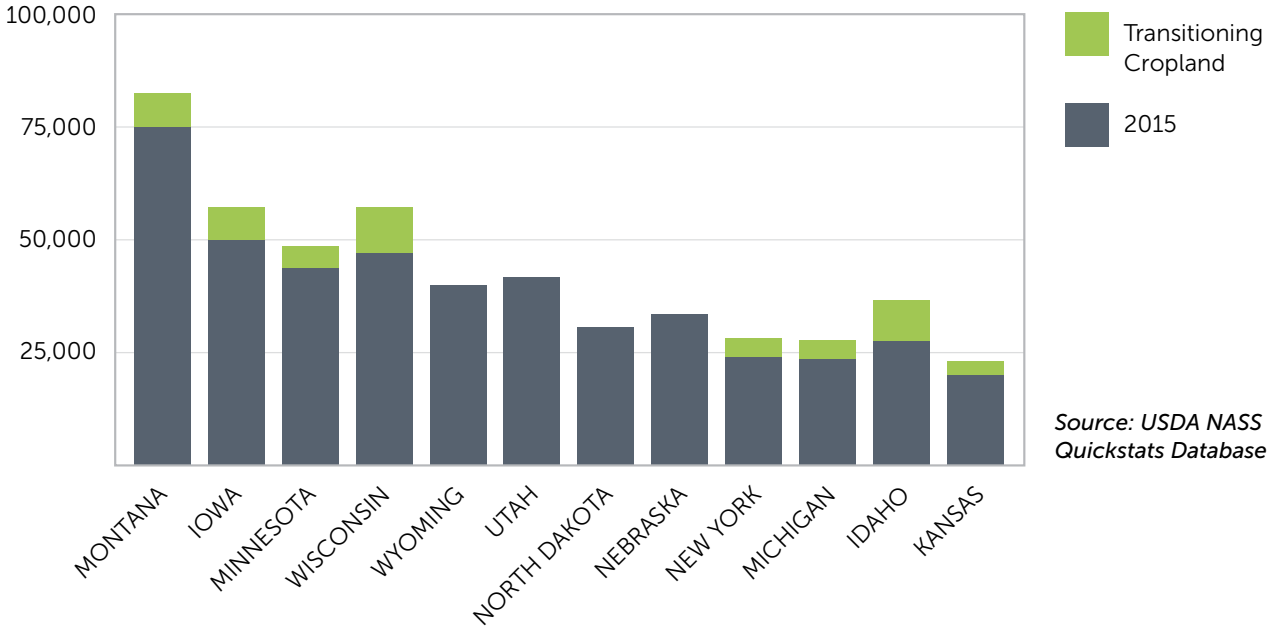
Future Production Regions

We predict that there are two regions most "ripe" for growth in organic grain production. First, a region in the upper Midwest, mainly Minnesota, Wisconsin, and Iowa, producing organic feed grains and organic soybeans. Second, a region in the upper West, centered on Montana, Idaho, and possibly North Dakota, producing primarily small grains.

One method to predict where organic grain production is likely to occur is to identify which of the major grain-growing states have significant cropland acreage in transition to organic. The top four organic grain states added organic cropland in 2015. Of the top ten, Montana, Iowa, Minnesota, Wisconsin, and Idaho all had significant acreage in transition in 2015. See Figure 5.

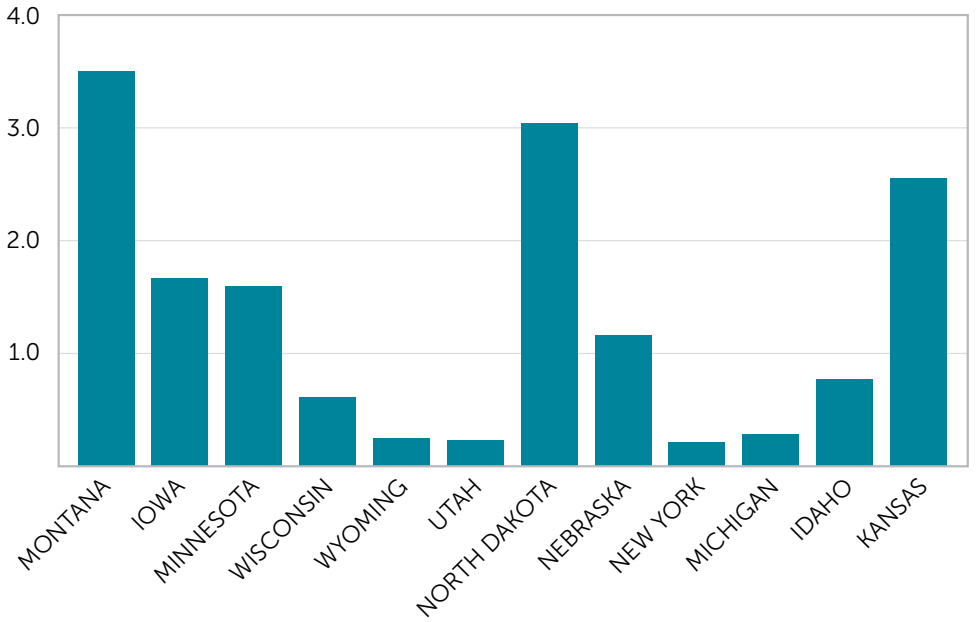
A second method for predicting future growth is to examine USDA's Conservation Reserve Program (CRP) acreage. Many growers who start growing organically do so when land that is nearby leaves the CRP (this is described in a following section). CRP contracts last 10–15 years and are often renewed after 10 years, keeping land in CRP for up to 20 years. Montana, Iowa, Minnesota, North Dakota, and Kansas each had at least 1.5 million acres in CRP in 2002. See Figure 6. It can be expected that some of the CRP acreage in these top organic grain-producing states will transition to organic grain production in the near future.

Figure 5: Acreage in organic grains and transitioning cropland, 2015



Source: USDA NASS Quickstats Database

Figure 6: Acres in CRP program in 2002 (Millions), top organic grain producing states



Source: USDA NASS Quickstats Database

Pricing Dynamics & Profitability—Impacts on Growth

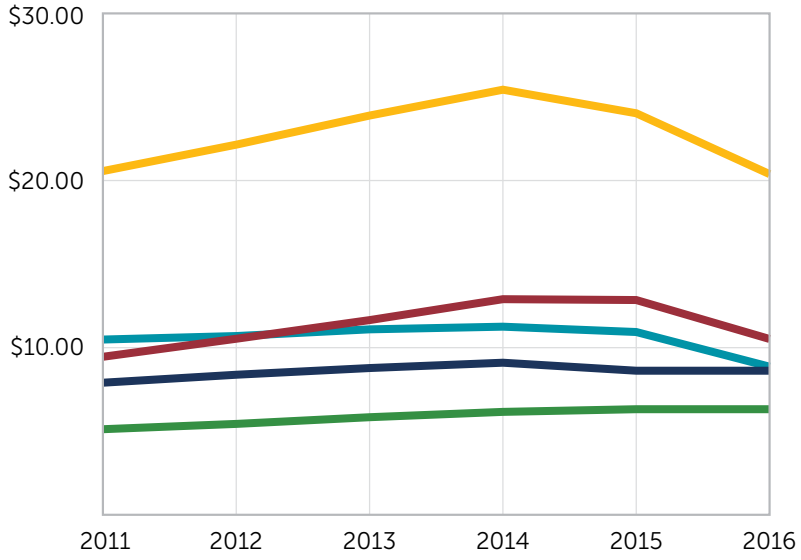
Prices rose an average of 9% from spring 2017 to spring 2018.

Market Volatility

Like conventional grains, organic grains pricing is characterized by volatility. Prices per bushel for organic corn, soy, and wheat climbed steadily from 2011 to 2014, reaching a peak in 2014. This bubble burst following 2014, and prices slumped in 2015-16, dropping further by 15–20% from 2015 to 2016. See Figure 7. Anecdotal evidence suggests that the market for organic food-grade specialty grains was even more volatile. The most important dynamic to pay attention to is the role that this volatility plays relative to conventional price. If we think back to the different types of farmers, there tends to be a difference in price sensitivity between those farmers who farm 100% organic and those farmers who have split operations. The farmers with split operations tend to make short-term decisions based on the relative attractiveness of the organic premium compared to the conventional price. Because organic management systems require longer-term planning to improve soils and optimize yields, this short-term volatility can be challenging for newly transitioned farmers, especially if they do not have the right coaching and resources to manage long-term for more variables than just short-term price and yield.

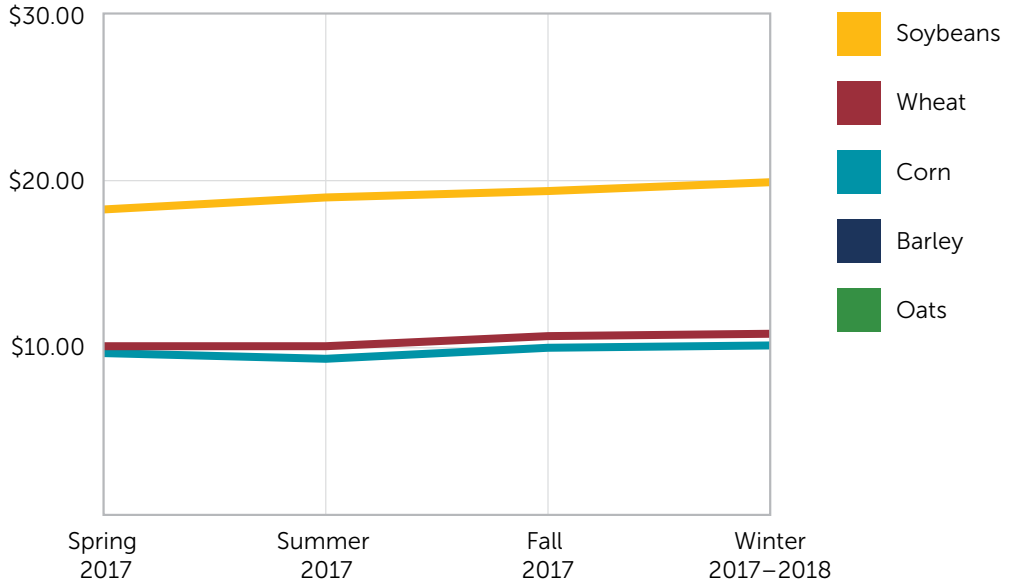
Prices have leveled off since 2016 and have begun to slowly climb, rising an average of 9% from spring 2017 to spring 2018. See Figure 8.

Figure 7. Average prices per bushel, organic grains, 2008–2016



Source: USDA NASS Quickstats Database

Figure 8. Average prices per bushel for organic corn, wheat and soybeans

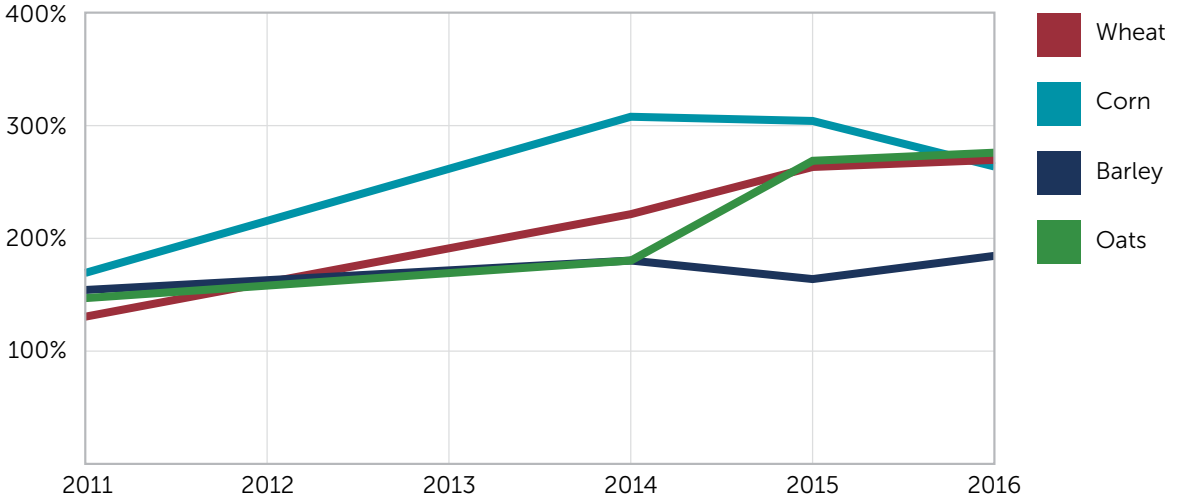


Source: Mercaris (https://mercaris.com)

Price Premium

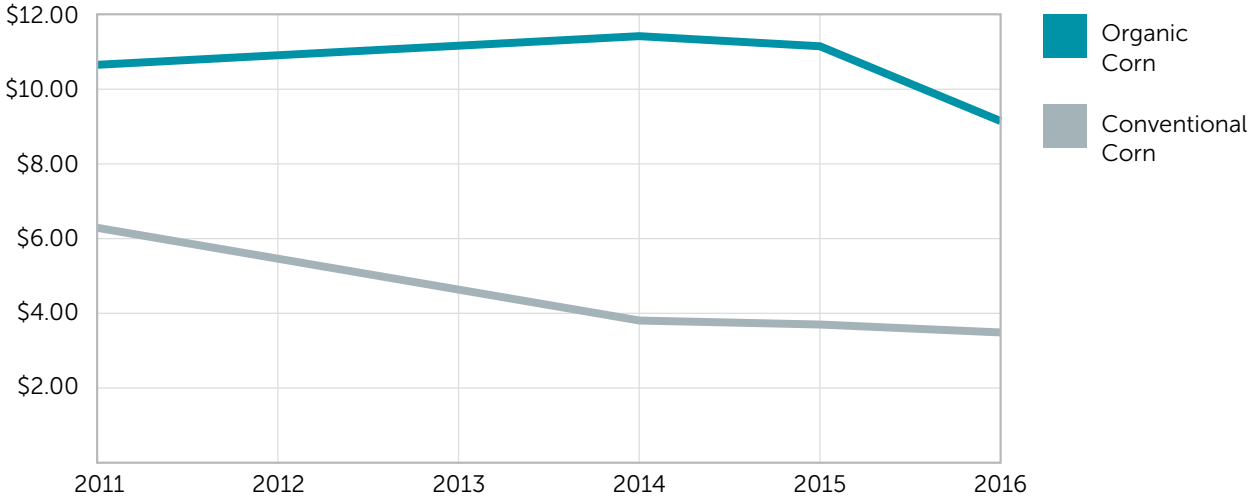
Overall, the organic premium has increased from 1.5 times the conventional price in 2011 to 2.5 times the price in 2016. The corn premium has declined slightly from its peak in 2014. Wheat, oats, and barley have maintained their premiums despite declining prices because conventional grains experienced a price "bubble" a few years prior to the organic bubble (from 2009 to 2011), and prices have since been consistently dropping. For example, conventional corn dropped from just over $6 per bushel in 2011 to $3.41 in 2016. Sees Figures 9 and 10.

Figure 9. Organic premiums vs. conventional prices, 2011–2016



Source: USDA NASS Quickstats Database.

Figure 10. Prices per bushel, organic corn vs. conventional corn



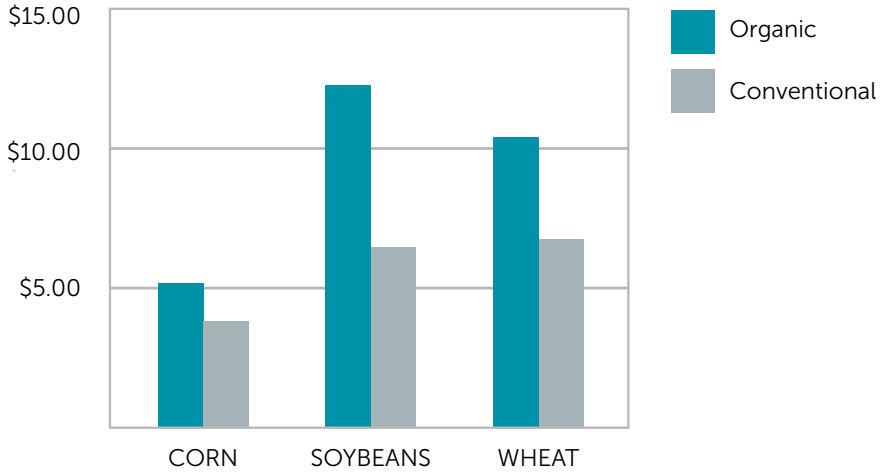
Source: USDA NASS Quickstats Database.

Per Unit Costs & Profitability

This report used enterprise budgets created by USDA's Economic Research Service to estimate the "unit costs" to produce one bushel of each type of grain organically and conventionally. The unit costs are derived for established organic grain farms with mature production systems. (New farm transition costs will be discussed in a following section.)

On a per unit cost, **organic grains production is more expensive than conventional**—up to 1.5 times more expensive for established wheat producers and almost twice that of soybeans. While much of the research shows lower per acre costs for organic (primarily because of lower input costs) the USDA ERS study used in this report loads all the business costs—overhead, costs of capital, owner's draw—into the per acre cost. Therefore, since organic producers tend to be lower in scale, their overall per acre costs are higher, and because they have lower yields, their per unit cost also tends to be higher. See Figure 11. Organic practices are more demanding than the conventional grain production model. Producers are required to use organic seeds, natural soil fertility methods like using cover crops as mulch, and non-chemical pest management. These practices require more time, effort, and a different skill-set which translates into higher operational and labor costs.

Figure 11. Estimated costs to produce one bushel of major grain crops organically and conventionally



Source: "The Profit Potential of Certified Organic Field Crop Production", USDA ERS Report #188.

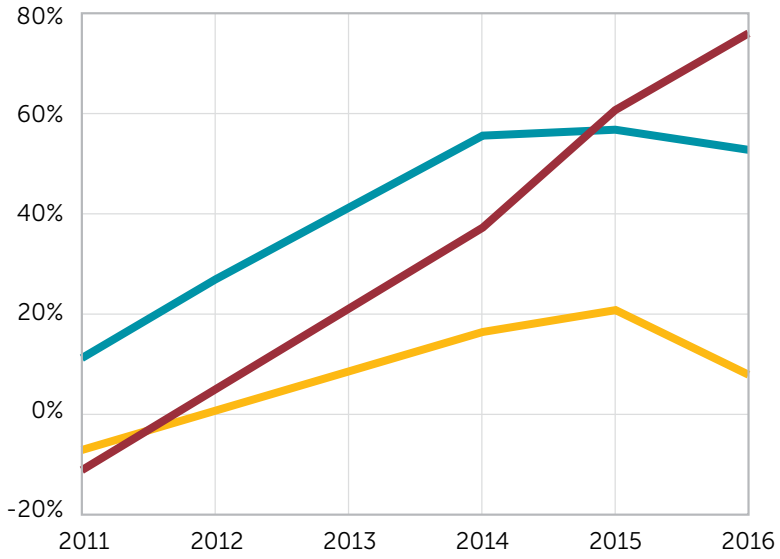
Numbers adjusted for inflation to 2016 levels.

Next, this report calculated the relative net margin (profitability) for each crop each year. 2011 marked the high point of conventional prices, at which organic grains on average were slightly less profitable than conventional grains. During the time period of 2008–2011, the number of farms growing organic grain in the U.S. declined by about 18%. After the bubble burst on conventional grain prices in 2011, the relative net margins on organic grains began to look more attractive. By 2016, organic grains on average had net margins that were 36 percentage points higher than conventional. See Figure 12.

On the ground, the perception that organic grains are more profitable is prevalent. The grain buyer interviewed noted, "The main reason that farms are moving toward organic is profitability. The general sense is that organic grains are more profitable than conventional. There is not a sense that this profitability will decrease over time. Everyone's confident that prices are higher." The farms that remained organic through the 2011 conventional bubble do perceive that they have higher margins, despite receiving lower prices now than in 2014. An important observation is that yields per acre for organic grain crops have increased since 2008. This indicates that production practices may be improving, and underscores the importance of continuing to support and grow funding for organic grain research. See Figure 13.

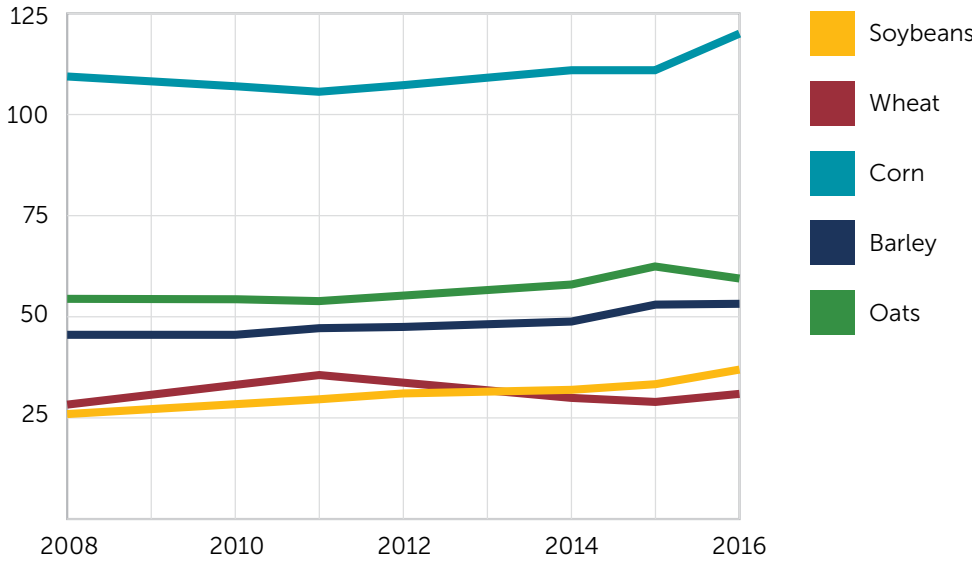
Yields per acre for organic grain crops have increased since 2008

Figure 12. Difference in Net Margin: Organic vs. Conventional
(0% = as profitable as conventional)



Sources: "The Profit Potential of Certified Organic Field Crop Production", USDA ERS Report #188, for costs; USDA NASS Quickstats Database for prices. Costs were adjusted for inflation.

Figure 13: Average yields per acre, organic grains

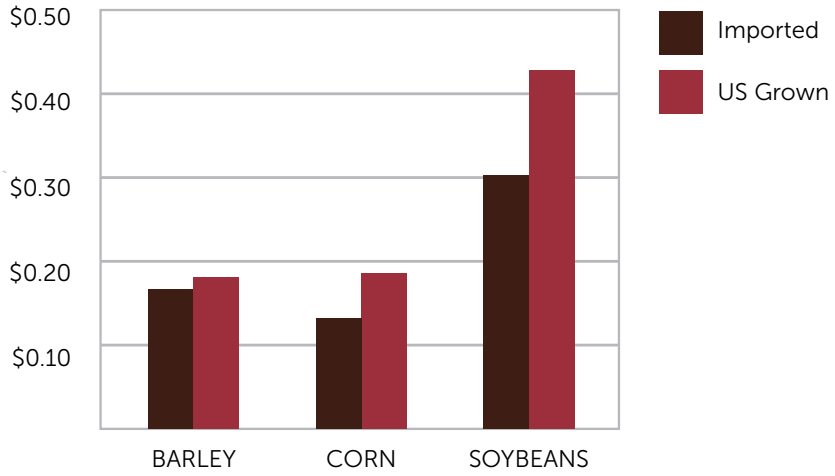


Source: USDA NASS Quickstats Database.

Global Competition Reduces Prices

Obtaining higher prices in the organic market by U.S. grain producers is undermined by competition by foreign producers. **Imported organic grains are cheaper than organic grains produced in the U.S.** See Figure 14. The 'competitive advantage' is largely due to foreign producers who have lower land and labor costs and have a relative per unit advantage when applying organic practices. This is reflected in the ultimate price of imported organic grain. Grain handlers also find that there are scale efficiencies involved in purchasing foreign imports. Grain lands in containers and can be shipped directly in large volumes, filling rail cars or barges, without the added cost of aggregation from multiple sources, as if often the case in the U.S. For example, foreign organic soybeans are a third cheaper than equivalent U.S. organic prices. U.S. organic grain producers need to respond through market mechanisms, likely through support from buyers, to stem foreign competition.

Figure 14: Average price per pound of imported and US Grown Organic Grains, 2016.



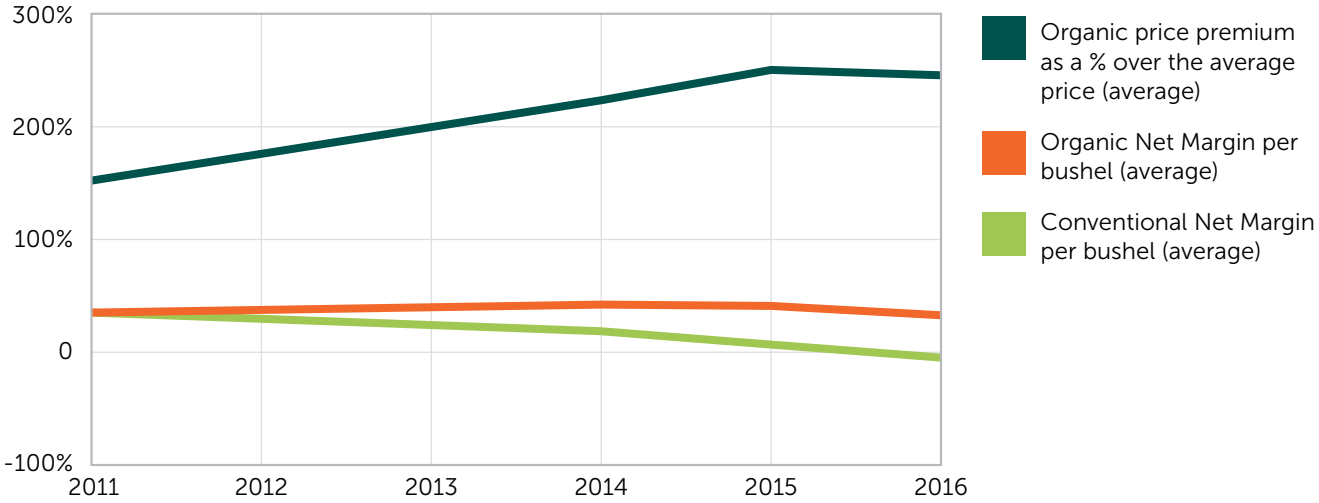
Sources: USDA NASS Quickstats Database for domestic prices; USDA GATS database for import prices.

How Pricing Dynamics Impact Growth

Grain is a commodity and prices are unstable, whether for organic or conventional. The transition to organic production is attractive to the extent that producers can maximize net margins. If it is a challenge to reduce per unit costs, comparatively, then the most value capture is achieved through higher prices. Price volatility leads producers, mainly **medium-sized grain producers**, to respond by **adapting their production system to supply the more favorable market**. When organic prices are consistently rising, there is a business case for organic transition if the producer steps into the organic market early. Volatility affects the viability of continued organic production beyond the short-term. Similarly, in times of strong conventional prices, the producer may be motivated to convert back to conventional, but the producer would have to accept sunk costs of the initial investments made in organic transition and consider the cumulative effects on the bottom line.

When the relative net margins of organic versus conventional grains are compared against the price premium of organic, it appears that **the organic premium needs to be about 2x the conventional price for organic producers to stay in the market**. In 2011, though the price premium was 1.5x, growers left the organic market because the premium was not high enough to offset organic's increased per unit costs. A premium of x3 seems to induce more rapid transition to organic; however, a x2 premium is the minimum to maintain steady levels. See Figure 15.

Figure 15. Comparing organic price premium vs. profitability



Sources: USDA NASS Quickstats Database, "The Profit Potential of Certified Organic Field Crop Production", USDA ERS Report #188, for costs

Challenges of Entering & Staying in Organic Grain Production

Price and market volatility underpin farmers' behavior and decisions to enter and stay in the organic market. In addition, there are three key barriers that can make it challenging for farmers to convert to organic. Market conditions discussed in the preceding section compound these barriers, and together they diminish the relative attractiveness of stepping in and staying in organic compared to what they are currently doing.

#1: High Cost of Transition and Market Guarantee at End of Transition Period

The business case for a farmer to convert to organic grain production appears risky when viewing it in the context of the transition period as **36 months from use of last prohibited substance**. The higher comparative cost cannot be recuperated during transition as it cannot be sold as organic and receive the premium on the market. During this time, the farmer is paying all the costs of organic production but is selling to conventional markets. Land and labor costs per unit cannot be recovered through the conventional market. This translates into a 'valley of death' that requires a producer to be in strong financial health to overcome. A medium-size farm that survives this financially difficult period can, by some estimations, turn a profit in the third or fourth year due to organic premiums that are triple market prices. Cumulatively this producer can begin to make a model net profit, accounting for the cumulative losses over the transition, by the fourth or fifth year.

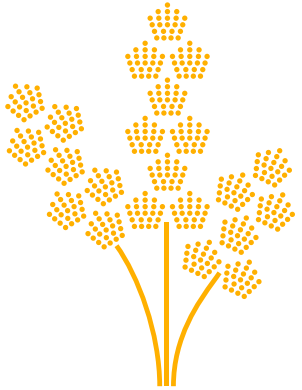
The transition period continues to be cited as one of the major impediments to organic production. One interviewee noted, "The prices that growers have to endure during this period cause them to run negative cash flow, and many don't have the capital and/or willingness to endure the transitional period." Several growers also noted that a farm undergoing the transition to organic will inevitably run into production issues as they shift to a new system, further lowering yields and profits. One noted that, "Inevitably, a farm making the transition will have lower yields as they adjust their soils and their management to organic. This, combined with the lower transitional prices, means they will run negative cash flow for a while." To demonstrate this, Table 1 calculates the cash flow of a 2,500-acre farm transitioning to organic.

Photo Credit: Rachel Jackson/Pipeline Foods

Table 1: Cash flow of 2,500 acre farm transitioning to organic (growing corn, wheat, and soy in equal 1/3 rotation)					
	Y1	**Y2**	**Y3**	**Y4**	**Y5**
Total Revenues	**$749,725**	**$749,725**	**$1,801,398**	**$1,801,398**	**$1,801,398**
Direct Production Costs					
Corn	$199,550	$199,550	$199,550	$199,550	$199,550
Soybeans	$117,036	$117,036	$117,036	$117,036	$117,036
Wheat	$91,844	$91,844	$91,844	$91,844	$91,844
Subtotal Direct Production Costs	**$408,430**	**$408,430**	**$408,430**	**$408,430**	**$408,430**
Less: Overhead, Equipment, and Land Costs	$550,000	$550,000	$550,000	$550,000	$550,000
Total Costs	**$958,430**	**$958,430**	**$958,430**	**$958,430**	**$958,430**
Net Profit	**-$208,705**	**-$208,705**	**$842,968**	**$842,968**	**$842,968**
Cum. Net Profit	-$208,705	-$417,410	$425,558	$1,268,527	$2,111,495

Sources: "The Profit Potential of Certified Organic Field Crop Production", USDA ERS Report #188, for production costs; USDA NASS Quickstats Database for yields and prices. Overhead costs were estimated at $550,000. Costs were adjusted for inflation to 2017 levels; prices used were from 2016 levels.

The farm stops applying prohibited substances in the summer before year one. In years one and two, it is using organic practices and getting the lower yields associated with organic production, but selling its grains for conventional prices. This means it is losing about $208,705 per year, for a total deficit of $417,000 by the end of year two. In the fall of the third year, the farm can now sell its grains for organic prices. It turns a profit of $843,000 in that year; but it needed $417,000 in working capital to get through years one and two.



Further complicating this is the matter of changing prices over time and no guarantee at the end of the transition period. This model assumes that prices stay the same over five years—something that has never been observed in the grain market. If a grower goes into debt during the transition, it is impossible to predict whether the organic prices at the end of the process will be high enough to justify the transition. Banks have trouble lending to transitioning farms because they don't have confidence in prices that are admittedly speculative and five years out.

Many growers who start growing organically do so with land that has been put into the USDA's Conservation Reserve Program (CRP). Under CRP, the USDA pays farmers not to grow on certain portions of land, while planting that land in some sort of long-term cover crop. The purpose of the CRP program is dual: to remove ecologically sensitive land from production, and to limit oversupply and stabilize prices. Land is often placed in CRP for contracts of ten or more years. In many places, CRP has become the default "bank account" of land upon which farmers draw when they add organic production to their farms. For instance, in Montana, which is the state with the highest amount or organic grain acreage in the country, 1.3 million acres left CRP from 2007 to 2012. Some growers have mixed feelings about using CRP land to jumpstart organic production, noting it will only work if managed in a conscious, thoughtful way.

Recently, there are attempts by the organic industry to promote a 'transitional organic' status to provide a market reward to support the three-year transition. Despite the consumer label and potential higher prices, there seems to be no significant consumer market demand for transitional products. In the feed grade market, some companies are willing to purchase transitional grains to secure supply (e.g. dairy and egg producers).

#2: Soil Fertility and Weed Suppression

Organic regulation prohibits most synthetic fertilizers, pesticides or herbicides. Therefore, organic production relies more heavily on tillage to manage weeds and extended rotations and cover crops to retain or improve soil health. Organic grain production systems should not mimic conventional rotations. To control weeds and pests, organic grain systems must incorporate relatively complex rotations of grains, legumes, and forages in the absence of herbicide application. However, due to higher per unit costs and lack of markets for lower value rotation crops, farmers tend to grow more simplified corn-soy-wheat rotations, therefore setting themselves up for management challenges with weeds and soil fertility issues ultimately resulting in lower yields.

To control weeds and pests, organic grain systems must incorporate relatively complex rotations of grains, legumes, and forages in the absence of herbicide application.

Without the ability to rely on synthetic fertilizer to insure a crop's fertility needs are met, farmers must utilize biological mechanisms to improve soil health, including extending crop rotations and incorporating cover crops. The productivity issue is challenged by the lack of technical assistance from independent crop consultants who understand how to employ these soil building tools to assist producers in aspects of organic management like the use of cover crops and extended rotation (discussed below).

Perennial weeds, such as Canadian thistle and bindweed, cause major production issues. These are especially a problem when conventional farmers switch to organic. The herbicides they have historically used suppress but do not fully kill tough perennial weeds that become troublesome in the newly transitioned organic systems. Interviewees attributed weed issues as a main reason producers leave organic. The use of smother crops like alfalfa can be effective in suppressing weeds, but it is a practice that conventional producers in transition must learn as they are accustomed to the use of herbicides. Conventional producers, particularly those with decades of experience, may not be interested or have the patience if the benefits are uncertain.

Furthermore, declining soil health is a recognized concern impacting grain yields across the Great Plains and mid-west Corn Belt. Without fertilizer, farmers must utilize other mechanisms to improve soil health, including extending crop rotations or incorporating cover crops. The productivity issue is challenged by the lack of technical assistance from independent crop consultants, USDA agencies and university extension specialists to assist producers in aspects of organic management like the use of cover crops and extended rotation (discussed below).

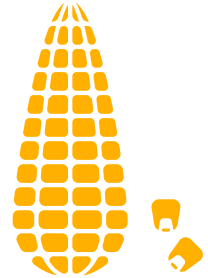
#3: Suboptimal Farm Management Resources

Through a series of interviews with extension and research professionals, leaders of farmer organizations, and farmers, we found that there is a lack of crop advisors with organic management literacy to support farmers, and traditional extension programs do not serve organic production well. Organic farmers are more likely to adapt farm management to a set of farming principles rather than a more prescriptive set of best management practices. Traditional extension models are designed to deliver prescriptive technical solutions, rather than support adaptive management approaches. Organic management principles and the ensuing top management concerns of farmers are universal: weed and disease pressure, soil fertility, as well as improved varietals. However, adaptive management innovations are localized based on specific factors such as climate and soil properties. Therefore, the traditional top-down model of extension does not typically serve organic farmers well.

Adding to this challenge is not the lack of organic resources or guides, but a lack of farmer and crop consultant-oriented materials housed in a centralized modern home, where the latest technology can make credible organic resources searchable by region and topic.

Photo Credit: Rachel Jackson/Pipeline Foods

Industry Solutions Needed



The issues and barriers organic grain producers face cannot be addressed by individual farmers alone. To meet the needs of the market and increase organic grain production, growers need coordinated industry assistance to address the systemic challenges discussed above. The following interventions can improve farmers' ability to enter organic, optimize production and eventually stay in organic.

#1: Provide long-term forward contracts

Price volatility combined with the costs of transition have made many farmers unwilling to commit to organic. Contracts provide the confidence needed to transition more acres to organic production. Forward contracts are the foundation to creating a stable organic grain supply. Once in place, they can be leveraged in several ways to finance or offset the costs of transition. For instance, banks are much more likely to lend money to a grower to help offset the negative cash flow of the transitional period if there is a promise to purchase at the other end.

Once long-term forward contracts have been established, there are various price management and investment mechanisms that can be considered to support producers in managing price volatility, ensuring cost recovery, and becoming more competitive in the marketplace. This is discussed in depth in the following paper, "Price management and investment mechanisms: Case studies for the U.S. organic grains sector."

Efficient organic production, particularly during transition, requires external support and market stability. Stable trading relationships can provide several technical benefits like technical assistance, farm development planning, and market signals to invest in their farm. However, a major challenge is that producers grow more than one crop. A key to success then is the extent that incentive mechanisms address the farming system. This may require a re-think of some buying companies' sourcing models to consider a producer's multiple crops and collaboration between different buyers.

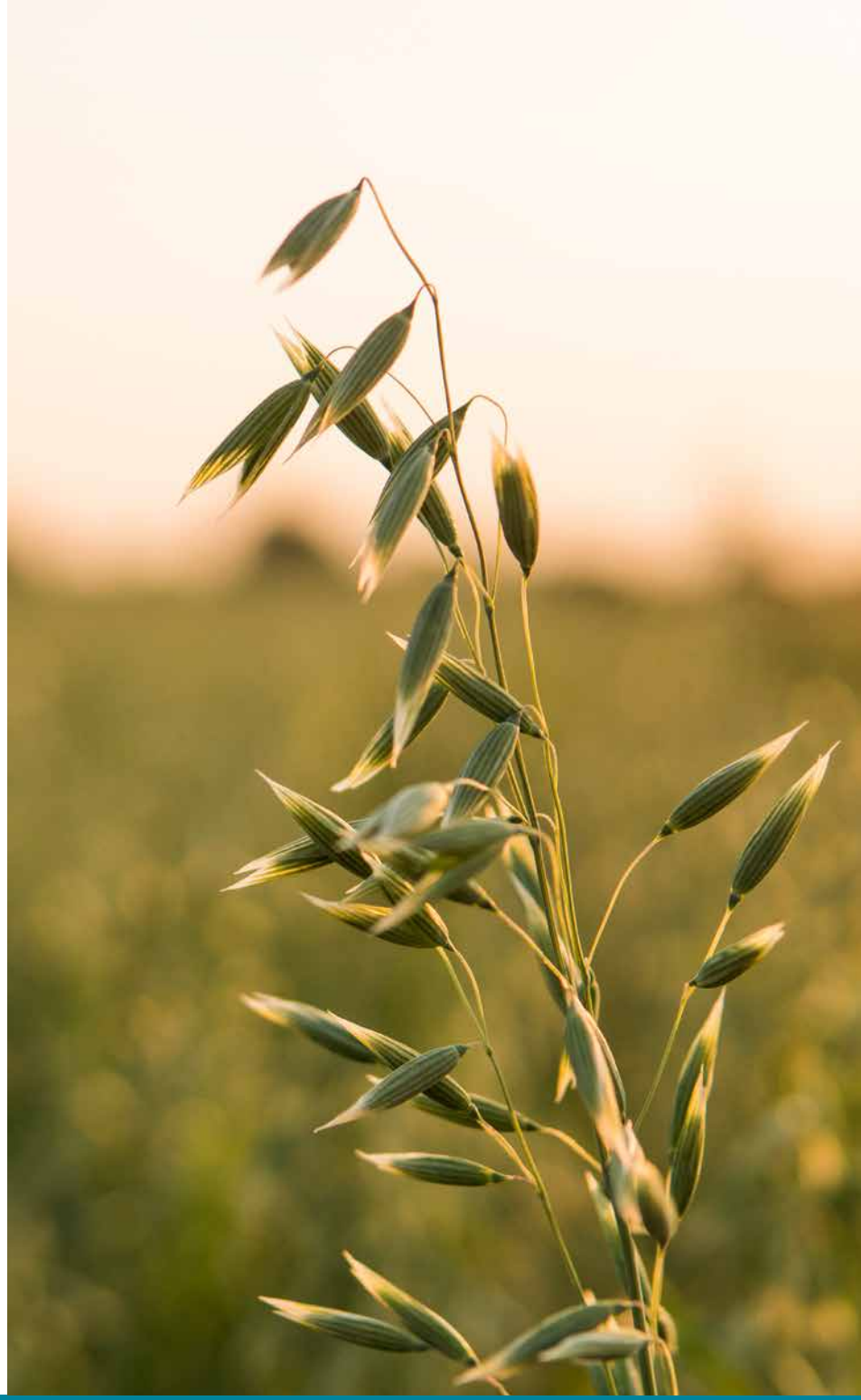
#2. Coordinate and develop markets for non-cash crops that increase soil fertility and suppress weeds

While long-term contracts and other pricing mechanisms are necessary for a stable organic grain supply, they are not enough to ensure the sustainability of that supply. Inevitably, weeds will become more difficult to control if organic grain rotations are limited to corn, soy, and wheat, and soil health will continue to decline. Smothering forage crops are an essential component of an organic grain rotation to control perennial weeds, and extended crop rotations or cover crops can improve soil health. To add such crops to their rotations, farmers need more consistent market signals to support their inclusion in rotation with higher valued crops. Without markets for weed suppressing and soil-building rotation crops, farmers are less likely to manage more diverse rotations to address future production challenge. Novel products like Annie's Mac and Cheese made with wheat and nitrogen-fixing pea crops are beginning to provide a solution. However, to achieve scale, coordination between feed and food markets that can share in the benefit of long-term organic productivity is needed.

#3: Increase organic literacy and create new models of knowledge delivery

A new model of extension is needed to support organic farmers. We are calling this model adaptive knowledge networks. These networks are principle-based and expert facilitated, but rather than prescribe, they support farmers to learn and innovate together around solutions and research that has been adapted for regional conditions. For these networks to be successful, research and innovation need to flow into the network and then be tested and adapted locally, then flow back out of the network to be shared and tested elsewhere. These networks have other benefits, such as building community and socializing farmers in the network. They are self-sustaining when they function as research and knowledge hubs, foster leadership in the farming community, and create links to larger networks (including connectivity to supply chains). These three core elements attract funding and lead to scale in a reinforcing loop of more success, more funding. Farmers would benefit from a modern, easy to navigate resource for market, certification, and production information. Currently, existing resources are housed in multiple locations and not readily available by region or in farmer friendly language.

Not all farmers rely on extension or publicly supported farmer education services. All types of crop consultants need to increase their organic literacy to meet the needs of all types of farmers. Training crop consultants to become more fluent in organic practices, certification, insurance, and transition should be a priority goal of the sector. In addition to train-the-trainer programs, farmers and crop consultants alike need an online tool and modern home to search for organic resources and guides by region and topic. While e-organic is available, it is not a farmer-facing resource, with easy to access, attractive guides to management practices that are up-to-date and written in farmer friendly language.



Conclusion

Given what we know about the effects of price dynamics on organic production coupled with organic production challenges and insufficient production resources/crop consultant infrastructure, the industry has work to do to keep organic growing and support farmers to stay in once they step into organic production. This paper recommends a strategy that focuses on the following set of interventions:

- **Utilize pricing mechanisms to address volatility, risk, and competitiveness**
- **Invest in increasing organic literacy for all types of crop advisors and support the design of adaptive knowledge networks**
- **Create a single resource to serve as the go-to online organic management resource**
- **Innovate in the design of novel food products and collaboration across the food and feed sector to create market pull for more diverse rotations**

Together, with the continued focus on organic research, these elements will support a solid foundation for the long-term productivity and profitability of the organic farmer.