



# GOT ORGANIC?

Welcome to the Age of 21st  
Century Organic Farming

Nancy Pfund, Lucas Strom • November 2018

November 2018

## About the Authors

**Nancy Pfund** is Founder and Managing Partner of DBL Partners, a venture capital firm whose goal is to combine top-tier financial returns with meaningful social, economic, and environmental returns in the regions and sectors in which it invests. As a leading player in impact investing, DBL has helped to reveal the power of venture capital to promote social change and environmental improvement.

**Lucas Strom** is Vice President of Business Development and General Manager of the Insurance businesses at Farmers Business Network, Inc., an independent farmer-to-farmer network that aims to enhance farmer profitability and create a better farm economy. The FBN network has grown to over 27 million acres of member farms in the U.S. and Canada. Lucas also owns and operates his 5th generation centennial family farm in Illinois.

## Acknowledgments

The authors wish to thank **Alex Bergonia** (UC Berkeley Haas MBA '20) and **Gordon Vermeer** (UC Berkeley Haas MBA '20) of the *Berkeley Innovative Solutions* program for their extensive research and significant contributions to this paper. We also wish to thank **J.P. Rhea** (CEO, AgriSecure) and 2018 DBL Summer Associates **Jake Harris** (Yale School of Management MBA '19), **Nick Matthews** (Harvard Business School MBA '19), and **Christina Whatley** (Yale School of Management MBA '19). **Lisa Hagerman**, **Patrick Sagisi**, and **Carol Wong** of DBL Partners also contributed.



# INTRODUCTION

*“You can only have so many bad years before you have to do something different to be profitable.” Three years ago, Brian Irlbeck—a farmer in Manning, Iowa—was not pleased with the profits from his conventional row crop acres. Searching for ways to boost his bottom line, Irlbeck started thinking about switching to organic farming methods. Like all farmers, he knew that diversification was key to managing risk and growing the long-term profit potential of his farm.*

But transitioning to organic farming was no trivial decision. Would his farm really be more profitable? Would he quickly develop the expertise needed for a whole new system of farm management? And did his farm have the financial means to invest in the necessary changes?

Ultimately, Irlbeck considered the consumer: “As farmers, we have to make sure we’re growing what our customers are looking for, and the crops we can get paid to produce.”

Over the past decade, there has been a dramatic increase in consumer-driven demand for organic crops. However, for many of the country’s large-scale farmers, the benefits of altering growing practices to meet this demand has been riddled with uncertainty. Irlbeck’s story illustrates some of the common barriers that large-scale farmers face as they consider switching their farms from conventional to organic, including concerns about lost revenue during the period of transition, the trade-off between higher prices and lower yields, and the challenges of finding adequate financing and guidance to convert traditional acres to organic. Most organic supply to date has come from smaller scale producers or livestock farmers, not the large-scale row crop farming operations like Irlbeck’s that make up more than half of all cropland harvested.

Change is in the air, and on the field. Over the last few years, solutions to these challenges have taken shape in a new wave of products, consultants and support services, and tech-enabled practices. Companies like AgriSecure now offer integrated advisory services to help transitioning farmers identify best-in-class crop inputs, technologies, and production techniques. Innovative technology companies like Farmers Business Network (FBN) have introduced precision data tools that provide actionable recommendations based on statistics and data analytics. This helps farmers boost crop yields, optimize post-harvest marketing, and increase farm profitability. This critical information—including real-time data about organic inputs and prices—can help farmers make more confident and knowledgeable decisions about transitioning to organic.

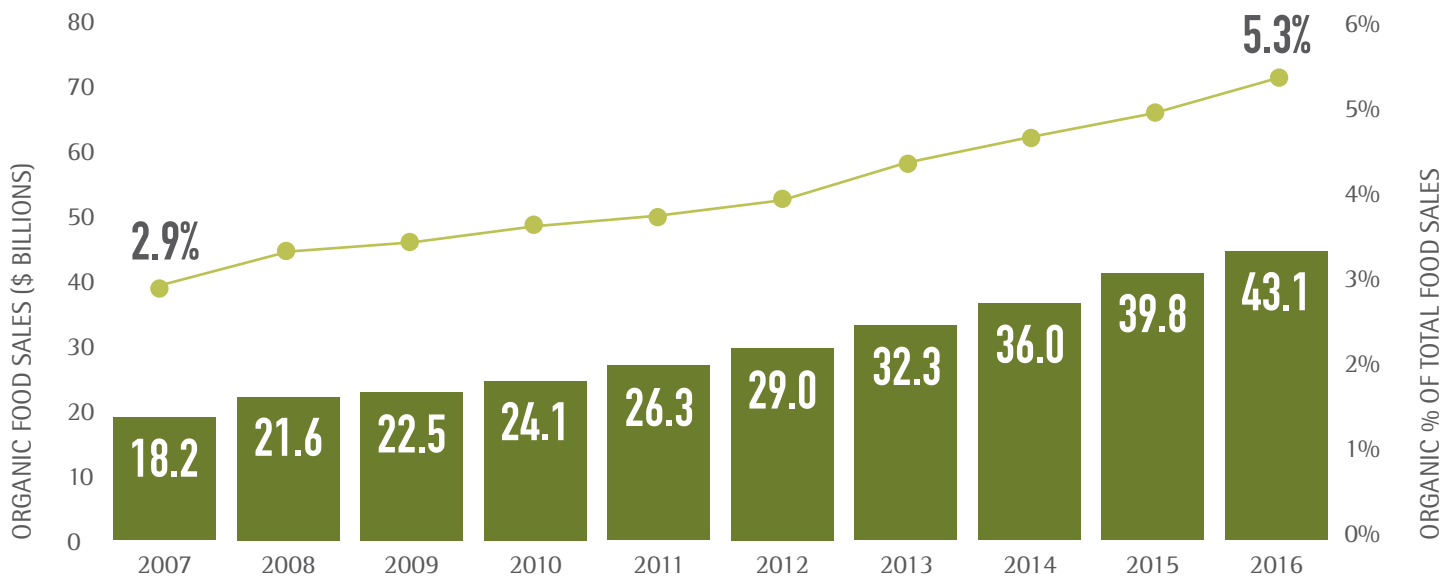


Exhibit 1: Organic food sales have steadily grown as a % of total food sales

Source: Organic Trade Association, 2017 Organic Industry Survey

*Over the last twenty years, organic food sales in the United States have seen a 15x increase, ballooning from just \$3.4 billion in sales in 1997 to over \$45 billion in sales in 2017.*

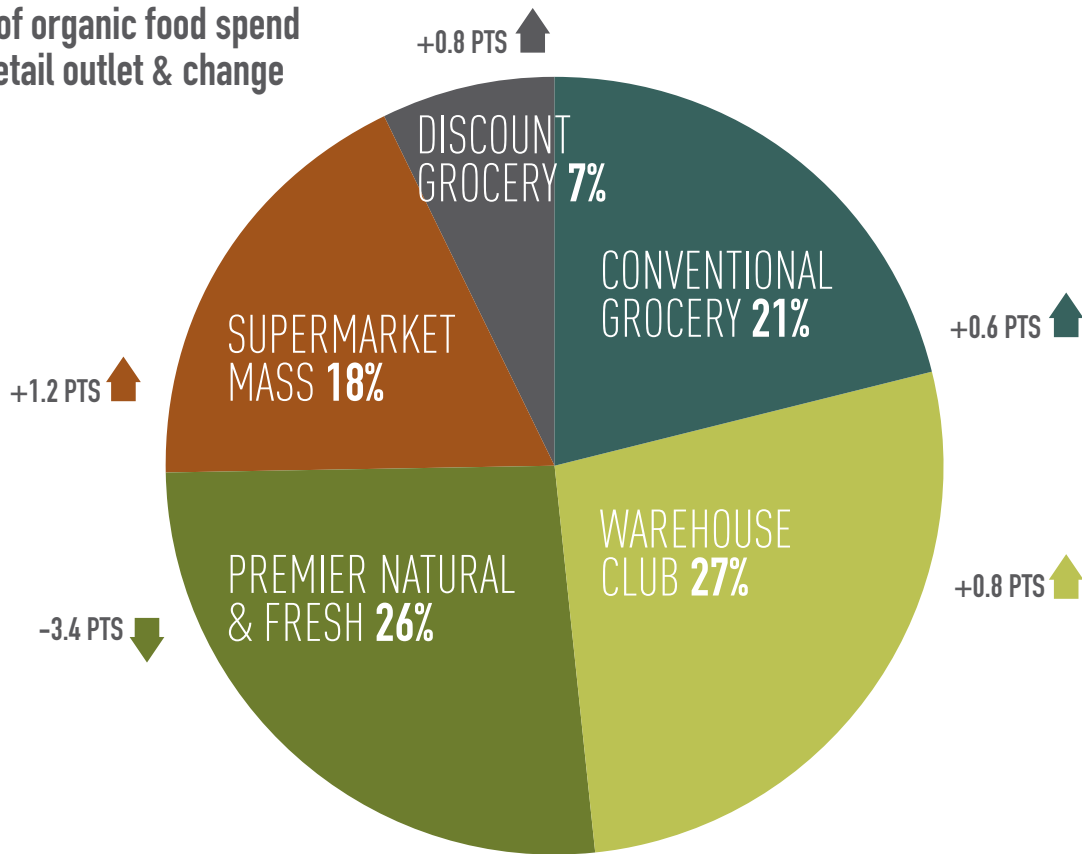
## The Rise of Organic Consumer Demand

Over the last twenty years, organic food sales in the United States have seen a 15x increase, ballooning from just \$3.4 billion in sales in 1997 to over \$45 billion in sales in 2017.<sup>1</sup> In 2017, the organic food market grew 6.4% year-over-year, which is significant considering the overall U.S. food market grew by only 1.1%.<sup>2</sup> In fact, as Exhibit 1 demonstrates, growth in the organic market has consistently outpaced the growth of the overall U.S. food market and is steadily capturing larger market share, in 2016 comprising about 5.3% of total food sales nationwide, compared to only 2.9% of total food sales a decade ago. (Organic crops are also used for non-food uses—primarily animal feed—but food for human consumption represents a large majority of the end use for organic crops: 91% in 2017.<sup>3</sup>)

In many ways, the term “organic” has become a household term and is playing a critical role in many consumers’ shopping habits. Within the last year, a remarkable 88% of U.S. households have purchased some amount of organic food and beverages.<sup>4</sup> According to Nielsen’s 2017 Category Shopping Fundamentals study, 29% of Americans say that organic claims influence their purchasing within the food and beverage categories, and 40% of consumers say organic certification is important when shopping for baby food.<sup>5</sup>

Alongside increasing demand for organic crops, there has been robust growth in the market for organic meat, poultry, and fish; in 2017, sales reached \$1.2bn, an increase of 17.2%.<sup>6</sup> This demand for organic meat, along with continued growth in organic dairy and eggs, has resulted in demand for organic feed grains, such as corn and wheat, to jump 35% this year as compared to 2016-2017.<sup>7</sup>

**2017 share of organic food spend by type of retail outlet & change from 2015\***



\*PERCENTAGES MAY NOT ADD DUE TO ROUNDING

**Exhibit 2: Organic spending is shifting away from premier and specialty stores toward the mainstream**

Source: Nielsen Answers On-Demand Syndicated Panel, 52 weeks ending 07/29/2017.

While a decade ago one would only find organic in premier or specialty grocery stores or in a select aisle at one's local retailer, organic goods have now penetrated multiple retail channels and are filling the aisles of grocery stores, warehouse clubs, and supermarkets (see Exhibit 2).

These trends are set to increase. A 2017 survey on the attitudes of U.S. families towards organic by the Organic Trade Association found that millennial parents are now the biggest group of organic buyers in America.<sup>8</sup> Considering less than a quarter of millennials are parents today and about 80% are expected to eventually become parents, we can expect this cohort to be a key growth driver of the organic market moving forward. Some analysts anticipate the market could grow by 14% annually through 2021.<sup>9</sup>

With consumers pushing this market forward, large corporate players are building out their organic offerings. Amazon's acquisition of Whole Foods and Kroger's launch of its Simple Truth Organic line serve as two examples.

However, as large retailers have been investing in organic brands and consumer demand continues to rise, the supply side of the market has struggled to keep pace. Of the 2.1 million farms in the U.S., only about 1% of them are certified organic and that share has stayed relatively steady over the last decade.<sup>10</sup> The mismatch of supply and demand is evident in the fact that the U.S. remains a net importer of organic varieties of many staple crops, including corn and soybeans.<sup>11</sup>

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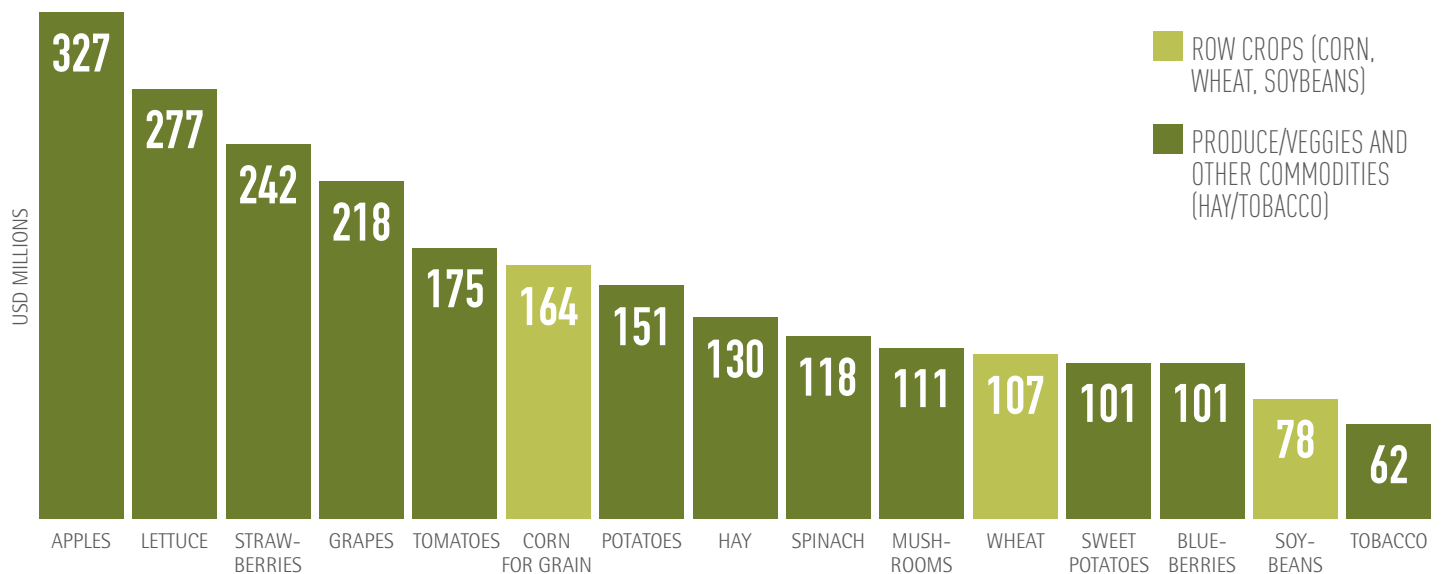
*The USDA's breakdown of organic crop sales from 2016 showed that commodity row crops lagged far behind vegetables, fruit, and livestock/poultry. Row crops made up only 9% percent of organic crop sales, and 5% of all certified organic commodity sales.*

## The Untold Story of the Rise in Organic Food: Row Crops are Lagging Behind

One of the key issues behind the mismatch in organic supply and demand is that, until recently, predominantly smaller-scale farms have been using organic practices or making the transition from conventional to organic. As a result, the typical organic farm is small and family-owned, and grows specialty crops like lettuce, strawberries, or grapes. Conversely, the farms growing staples like corn, soybeans, and wheat (collectively termed “row crops”) that comprise most of American agricultural area and supply are predominantly conventional.

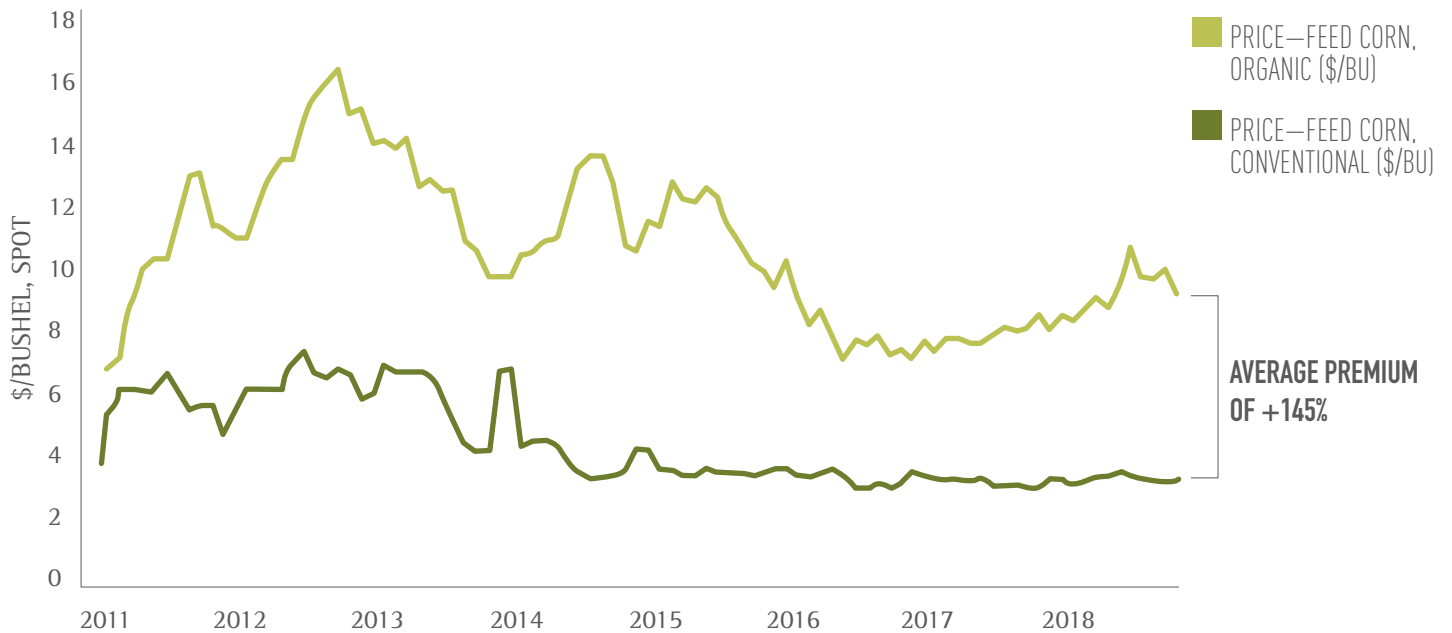
The USDA's breakdown of organic crop sales from 2016 showed that commodity row crops lagged far behind vegetables, fruit, and livestock/poultry. Row crops made up only 9% percent of organic crop sales, and 5% of all certified organic commodity sales.<sup>12</sup>

The result is that over the last five years, there has been a significant domestic supply shortfall for organic row crops, leaving U.S. users to rely on organic imports to bridge the gap. According to estimates from organic data provider and auction platform Mercaris, approximately 78% of organic soy and 41% of organic corn used within the U.S. during the 2016-17 crop year were imported, representing over \$400m in lost potential revenue for U.S. farmers.<sup>13</sup>



**Exhibit 3: Corn, soybeans, and wheat compose only 9% of organic crop sales**

Source: USDA's 2016 Certified Organic Survey, NASS Highlights. Accessed 12/1/18 at [https://www.nass.usda.gov/Publications/Highlights/2017/2016\\_Certified\\_Organic\\_Survey\\_Highlights.pdf](https://www.nass.usda.gov/Publications/Highlights/2017/2016_Certified_Organic_Survey_Highlights.pdf).



**Exhibit 4: Organic corn shows persistent historical price premium over conventional alternative**

Source: Organic prices from author correspondence with USDA AMS (Agricultural Marketing Service), midpoint of national range for organic feed corn. Conventional prices from USDA NASS (National Agricultural Statistics Survey), U.S. Total monthly price received.

## Untold Opportunity? The Farm-Level Case for Organic Row Crops

The case for organic row crops seems clear at the aggregate level—demand far outstrips supply. This leads to a strong case at the farm level that switching to organic could be a good choice.

First, in many cases, the economics are appealing. Organic row crops have fetched a significant price premium over conventional varieties over the last five years: spot prices for organic corn have averaged between \$9-12/bushel over the last ten years, and organic soybeans have brought in between \$18-25/bushel. By comparison, the price for conventional corn has typically been \$3-5 over this same period, and for conventional soybeans has been \$8-15.<sup>14</sup> As the following section discusses, these price premiums often translate into higher farm profitability.

There is also a significant positive environmental impact when a row crop farmer makes the transition to organic. Organic cultivation reduces use of pesticides, chemicals, and synthetic fertilizers, and also reduces water pollution; this has obvious benefits for the local ecosystems but also reduces health risks to farmers by cutting exposure to harmful substances. Organic methods such as cover crops or mulches can also help protect soil from heavy rain, limiting erosion concerns on tilled ground.<sup>15</sup>

But a farmer need not be motivated by ideology to recognize these benefits. By definition, organic farming is intended to be a more sustainable system that conserves

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inputs and enriches soil—the very ‘natural capital’ on which a farm depends—so it clearly has potential for meaningful economic benefits. According to the Rodale Institute, certain types of organic farms use substantially less energy and produce significantly less GHGs than their conventional counterparts.<sup>16</sup> Well-managed soil can actually be a substantial carbon sink. While it is currently difficult for farmers to meet the standards to participate in carbon markets (for example in California), there are signs that governments are picking up on the benefits of ‘carbon farming’ as a means to achieve ambitious climate goals.<sup>17</sup> New tools such as USDA's COMET-Farm can help farmers calculate their GHG outputs and carbon benefits (via sequestration) based on farm-specific inputs such as size, crops, inputs, and soil type. The tool also allows farmers to understand the impacts of implementing beneficial conservation practices such as reduced- or no-tillage, cover crops, or riparian buffers.<sup>18</sup>

Given this rising tide of consumer demand, the lack of supply, better technological tools, potential economic gains, and the positive environmental impact, one must wonder: why haven't more row crop farms made the transition to organic?

# THE BARRIERS TO SWITCHING

Based on studies and firsthand conversations with farmers, there are three main barriers to switching to organic: concerns over lower yields and higher production costs, challenges with financing, and a lack of support to manage the wholesale shift in farming practices required to 'go organic.'

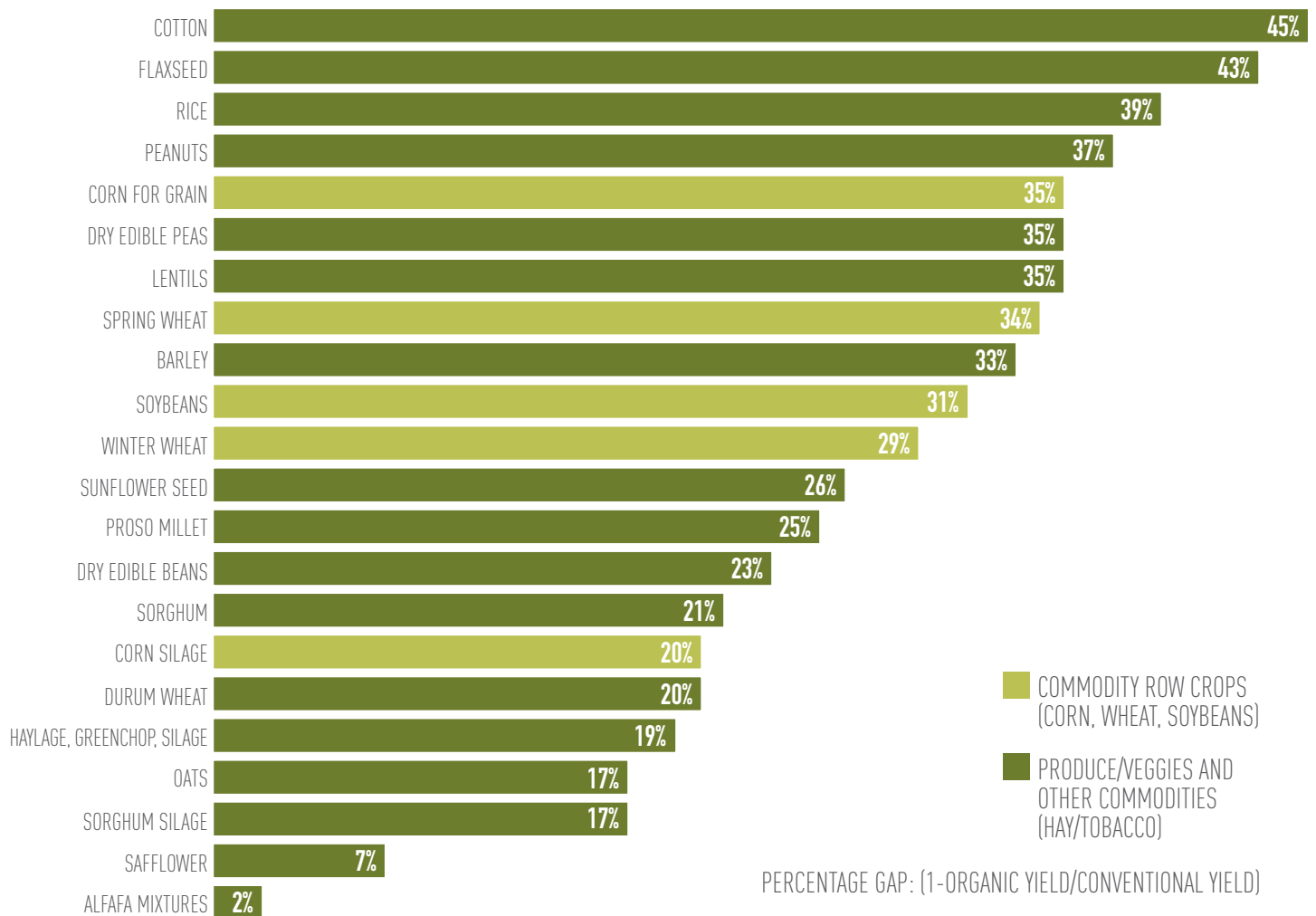
## Lower Yields, Higher Costs, Higher Profit?

Farmers who have considered switching to organic frequently cite organic production costs as a barrier; there is a perception among farmers that costs are higher and organic yields are lower than status quo conventional farming. Simply speaking, they are correct. USDA data show that yields on organic row crops vary from about 20% lower than conventional for alfalfa, to about 45% lower for cotton (Exhibit 5 illustrates the yield gap between conventional and organic row crops).<sup>19</sup> The reasons for the lower yield vary by crop type and region. In some cases, yields are lower due to an inability to meet peak nutrient demand using only organic sources, while in other cases, the yield differential represents higher losses to disease and insects.<sup>20</sup>

In terms of costs, research suggests organic corn may cost about \$83-98 more per acre than conventional corn, and soybeans \$106-125 more, in large part due to higher labor costs for weeding and spraying.<sup>21</sup> Other organic stipulations also have clear implications for overall costs: buffer zones are required at field peripheries to prevent cross-contamination, which typically decreases planted area; crop rotations are required to improve soil health and prevent erosion, which may not be financially optimal or as profitable; and crop residues may not be burned for disposal, which might result in higher tilling and planting costs.

But these statistics tell only half the story. First, these summary cost figures ignore the scale discrepancy between today's organic and conventional farm operations; organic farms are far smaller on average and more likely to be either growing highly specialized, high value produce for niche markets, whereas conventional farms are larger on average and more likely to benefit from economies of scale. More importantly, this perception focuses on inputs and outputs—cost and yield—rather than the metric that ultimately matters to farmers: profits.

*In recent decades, big agribusinesses have intensely marketed inputs and technologies to row crop farmers based on their ability to increase yield. Despite lower yields and higher costs, organic row crop farming is often more profitable than conventional row crop farming because of the higher crop sale prices.*



### Exhibit 5: Average yields per acre for organic crops are substantially lower than conventional counterparts

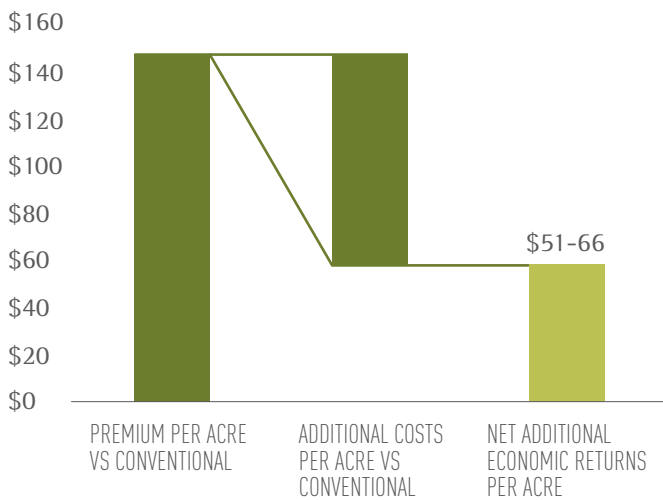
Source: Savage and Associates Consulting, independent analysis based on 2014 USDA Organic Survey data and USDA-NASS statistics.

In recent decades, big agribusinesses have intensely marketed inputs and technologies to row crop farmers based on their ability to increase yield. Take the example of corn: after the federal Renewable Fuel Standard was signed into law in 2005, the perception proliferated that ethanol plants would provide massive new sources of demand. Indeed by 2011, about 40% of corn grain was channeled to ethanol processing.<sup>22</sup> With high-profile sources of demand and strong conventional corn prices in 2011-2013, many farmers were persuaded that ever higher yields were required to be successful.

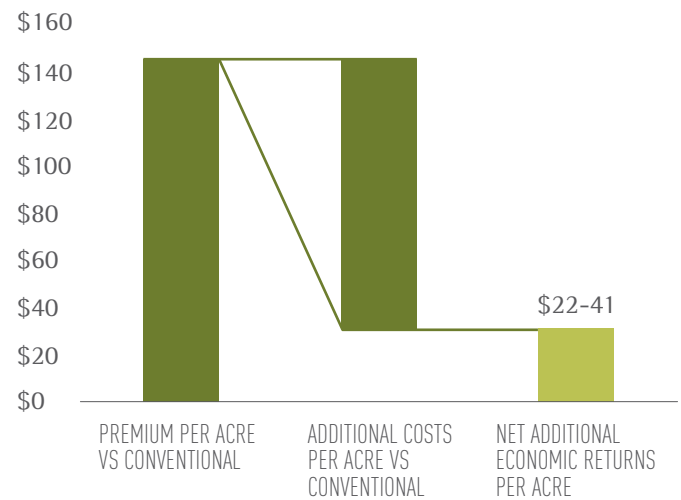
But doing so distracted from the underlying profitability. What if the marginal costs to achieve greater yields outweighed the increased revenue?

The reality is that, based solely on profits per acre, organic excels. Despite lower yields and higher costs, organic row crop farming is often more profitable than conventional row crop farming because of the higher crop sale prices. Studies show a profit premium of \$51-66 per acre for corn and \$22-41 per acre for soybeans<sup>23</sup> (Exhibit 6).

## ORGANIC CORN



## ORGANIC SOYBEAN



### Exhibit 6: Premium prices outweigh additional costs: organic corn and soybeans return better profits

Source: McBride et al., The Profit Potential of Certified Organic Field Crop Production, 2015

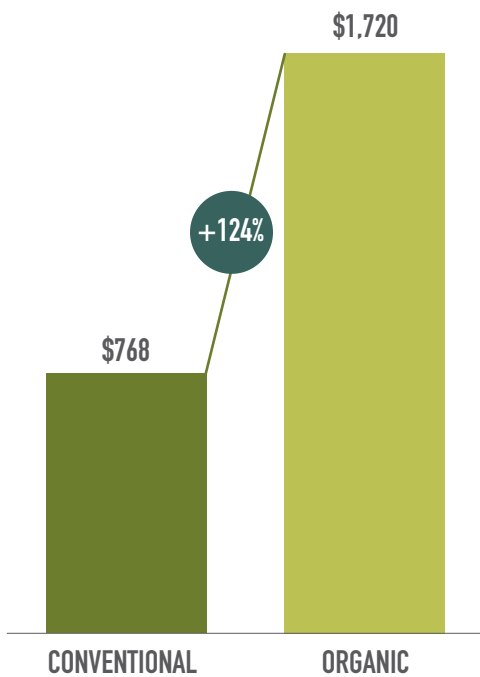
J.P. Rhea knows this well. Rhea is a fifth-generation farmer who returned to his family farm in Washington County, Nebraska after spending ten years away from farming in the corporate world. His return to farming in 2008 was followed by a multi-year spike in commodity prices, which heralded robust returns for row crop farmers. The farm was doing well, but Rhea realized that the farm's high margins were due primarily to high corn prices, which were caused by the fortuitous (from the farmer's perspective) confluence of drought-affected harvests with huge demand for ethanol under the Renewable Fuel Standard. Despite a booming business, the farm's profitability was largely driven by factors outside their control, and there was no guarantee that the good times would continue. The Rhea family wanted to make a change that would ensure their success for the long-term.

J.P. Rhea and his family had already been long-time believers in sustainability and value-added production. They saw organics as a better way to monetize their core values in sustainability and decided to make the transition to organic farming.

Their transition to organic started small with just a few hundred acres. They benefited from already having part of the farm dedicated to alfalfa cultivation; alfalfa is commonly grown on organic transitional acres because it's beneficial for soil health and doesn't require many expensive inputs. After years of learning and refining their techniques, in 2016 the Rhea Brothers Farm (as it is now called) took the significant step of devising a plan to convert the entire operation to organic. Today Rhea has 6,000+ acres certified organic with another 5,000+ in transition.

The Rhea Brothers' commitment to organic farming has yielded impressive results. In 2017, their corn yields were 11% lower and fieldwork costs significantly higher than conventional farming. But due to the price premium for organic corn, their revenues rose 124% per acre and they achieved profits over \$800/acre higher (Exhibit 7). Rhea credits their success to a very professional, business-oriented management team and their measured approach to scaling.

**RHEA BROTHERS 2017  
CORN REVENUE PER ACRE**



REVENUE (\$/ACRE)	CONVENTIONAL	ORGANIC
YIELD (BU/ACRE)	194	172
PRICE (\$/BU)	3.96	9.40
<b>REVENUE (\$/ACRE)</b>	<b>\$768</b>	<b>\$1,720</b>

EXPENSES (\$/ACRE)	CONVENTIONAL	ORGANIC
SEED	90	89
FERTILIZER	161	153
CHEMICAL	55	13
FIELDWORK	117	250
OTHER	45	44
RENT	287	287
<b>TOTAL EXPENSES</b>	<b>755</b>	<b>836</b>

INCOME	\$13	\$884
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**Exhibit 7: Rhea Brothers 2017 data illustrates the profit potential of organic farming**

Source: Rhea Brothers Farm.

Even though the magnitude of this difference will vary by year and by farm, the takeaway is clear: converting to organic can be highly profitable for farmers.

The Rhea Brothers' results also point to the opportunities for optimization from professionalized organic farm management. Whereas agrichemical-intensive farming has benefited from extensive R&D efforts to improve yields and optimize efficiency, organic farming has historically been the preserve of smaller farmers and has not yet benefited from the same investment. But there is evidence that farmers who take a more data-driven approach stand to reap the rewards. The Rodale Institute, for example, conducted an extensive 30-year research program which found that after the initial transition period, organic corn and soybean yields matched conventional systems, had 31% higher yields in years of drought, and could tolerate higher levels of weed competition.<sup>24</sup> As an additional benefit, organic systems result in improved soil health over time, leading to a sustainable advantage over conventional systems. The case for conversion across many crops and regions is strong in the short run, but may be even more compelling over longer time horizons.

# Financing for the Would-Be Organic Farmer

Financing the transition to organic is another key challenge for farmers. Under the USDA National Organic Program, which is the federal regulatory framework governing organic food, farmland must be free from prohibited substances for at least three years before crops or produce can be certified and labeled organic.

In this transition period as illustrated by Exhibit 8, farmers face the challenge of more uncertain and lower yields as they adapt their production practices, while not yet benefiting from the premium that organic crops earn, therefore generating lower profits. The USDA's 'Certified Transitional' label, which farmers can use from the second year of transition onward, is supposed to ease the burden—but in many cases the price premium is limited for crops during the transition period. As a result, while the organic certification itself is reasonably affordable (\$700-1,500 for a new farm), the financial uncertainty during the transitional years can be too much for farmers to take on without external support.

This challenge is compounded by the already 'leveraged' nature of farming. In addition to typical mortgage debt, it is common practice for farmers to use short-term debt financing to help pay for seed, inputs, and other growing costs each year. Debts are then repaid after the harvest and sale of crops. While the system of local, agricultural banks provides much of this financing to farmers, it is also offered by the seed companies, input companies, and service providers themselves.

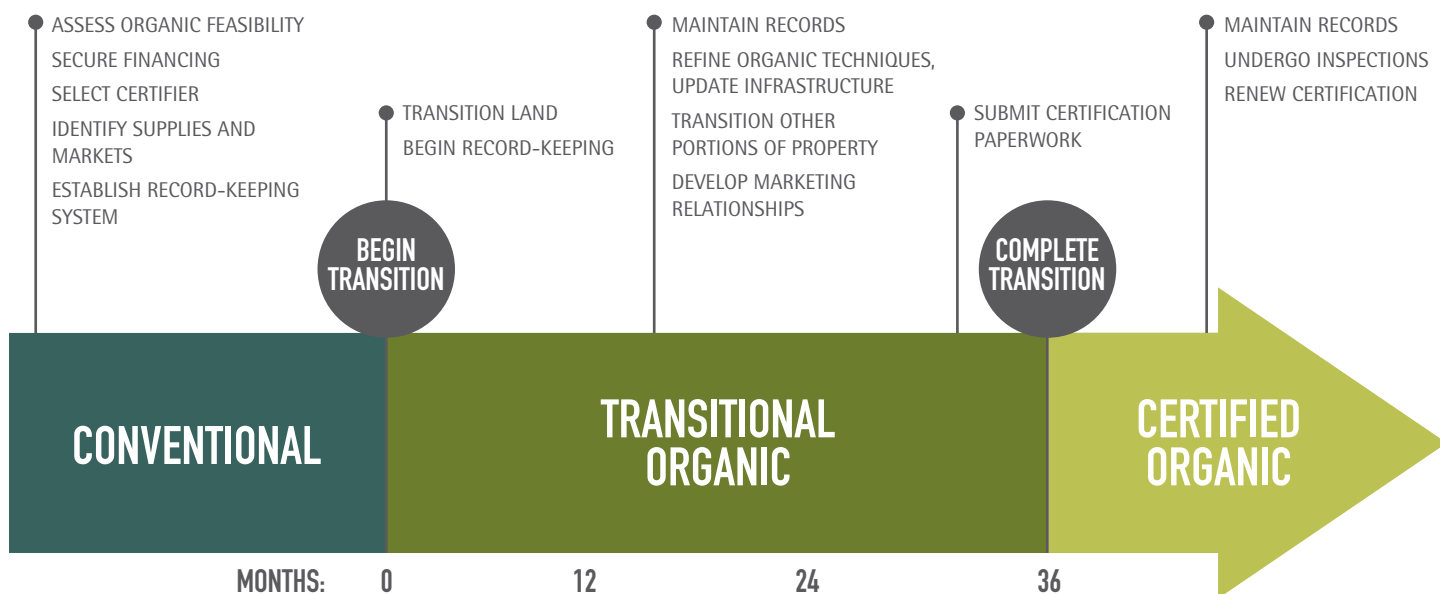


Exhibit 8: Organic transition is a complex, multi-step process

Source: Author analysis. More detail available at <https://www.ams.usda.gov/services/organic-certification/becoming-certified>. Adapted from MOSES Guidebook For Organic Certification.

*Across the food value chain, farmers already bear an outsized amount of financial risk. For many, the additional risk of an organic transition seems too great. Several approaches and funds have cropped up to help finance this transition. At the same time, the fact that so many farmers still cite the financing risk as a major barrier to organic adoption demonstrates that more needs to be done.*

In general, organic farms do not have the same access to financing as conventional farms. On top of that, lending to all types of farmers has already been squeezed by post-2008-crisis regulatory restrictions on the banking system; community banks, which provide 44% of loans to purchase farmland and 43% of farm-operations lending, have been disproportionately affected by these new laws.<sup>25</sup> So for a would-be organic farmer in 2018, finding three or more years of increased financing is a significant—and sometimes impossible—challenge.

The federal government has attempted to ease this burden by providing financial assistance for the transition period, including the USDA's National Organic Initiative funded through the Environmental Quality Incentives Program. The program allows farmers to apply for funding for specific projects with a conservation benefit, totaling up to \$20,000 a year in reimbursement for costs if they are deemed compliant with USDA NRCS (Natural Resources Conservation Service) standards and specifications.<sup>26</sup> However, this financing is provided based on the relative conservation benefit the work will provide as ranked against other local projects, making it a less reliable source of funding as farmers consider the transition.<sup>27</sup>

Across the food value chain, farmers already bear an outsized amount of financial risk. For many, the additional risk of an organic transition seems too great. Several approaches and funds have cropped up to help finance this transition. At the same time, the fact that so many farmers still cite the financing risk as a major barrier to organic adoption demonstrates that more needs to be done.<sup>28, 29</sup>

## Managing Change and the Information Gap

With targeted action and support, the previous barriers identified can be mitigated: perceptions around yield and costs can change with more information and education, and financing challenges can lessen with new loan approaches and partnership models. And yet, perhaps the biggest barrier for farmers is the scale of the operational change required.

Switching to organic requires a wholesale shift in farming practices and administration. First, record keeping and documentation for organic certification is extensive and more onerous than for conventional farming. The foundation for each operation is the organic system plan (OSP), which describes all of the farm's practices and is the basis for certification.<sup>30</sup> This plan must cover crop selection and rotation, soil fertility, equipment needs, weed and pest control, and a marketing plan. It's essentially an operational blueprint—which, for a transitioning organic farmer, contains radically new content.

On top of the OSP, farmers must maintain detailed, auditable records of all farm activities relevant to organic certification; the USDA-qualified certifying agent and farm inspector will expect to see a record of every seed purchase, every fertilizer application, and every cultivation practice, for example. This record-keeping requirement applies as soon as the three-year transition period begins, which means that farmers realistically need substantial time *beyond* the official three-year transition period to prepare a records system and choose and talk with a certifying agent.

Switching to organic also typically entails building a whole new value chain—upstream, on-farm, and downstream. Upstream, a common fear is that the supply chain for organic-compliant seeds and inputs is less sophisticated and subject to shortages. Certain pesticides with naturally occurring ingredients are actually permitted for use on organic crops, for example, but are far less likely than conventional chemical pesticides to be available from local farm suppliers.

On the farm, because of the strict requirements to keep organic products separate from conventional, farmers need to segregate crop storage infrastructure and the associated machinery. (For example, all equipment used for organic cultivation—whether owned, rented, or contracted from a third party—must be “cleaned” or “purged” if it has also been used on conventional fields.<sup>31</sup>)

These same segregation requirements mean that grain elevators and other sale points typically do not accept both conventional and organic products, so farmers will often have to travel significantly farther to make organic crop deliveries.<sup>32</sup> Traditionally, much of the guidance from USDA and others on organic crop marketing has focused on direct sales (e.g. to restaurants, farmers markets, or other niche markets), which is optimal for small specialty farms but likely not as applicable for commodity row crop growers.

Finally, knowing whether organic farming will be profitable also depends heavily on agronomic idiosyncrasies. Often called “holistic” farm management, this entails new and increased knowledge about soil quality, crop rotations, and pests and diseases. The paramount need for more and better information—agronomic, economic, and logistic—is undeniable.

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# TOOLS FOR THE TRANSITION: OVERCOMING THE BARRIERS

Organic row crops are in increasing demand by consumers, are often economically beneficial for farmers, and can be a boon for the environment. The barriers to adoption are clear, but the good news is that a promising set of innovations in service provision, technology, and financing are paving the way for more informed and rapid transition to organic practices.

*Organic farming can provide valuable diversification for many farmers. But diversification brings added complexity, especially at the outset.*

## Transitional Service Provision: Guides for the Journey

As demand for organic continues to grow, the business case for transitioning to organic will become increasingly apparent for a wide array of farming situations. As with any large-scale business transition, however, farmers will need help. This opens exciting opportunities for trusted organizations such as AgriSecure (see box) to partner with farmers on this journey—providing resources and education on the opportunities in organic, helping them finance the transition, and giving them the data they need to decide if going organic is right for them.

As an example, consider the challenge a new organic farmer faces when forming an operational budget for the crop year. This budget will be crucial for ordering inputs, securing financing, writing a tactical plan, triaging and prioritizing problems, benchmarking performance, and analyzing results. As one would expect, most farmers depend on historical data to generate reasonable projections—but if a farmer is transitioning to organic, there's no history there. He or she will most likely be buying new products and using new techniques. And in many cases, organic transition will be launched on a portion of the farm while retaining conventional practices on the rest. The additional complexity and uncertainty points to a clear need for specialized advice.

The organic certification process itself also poses a significant challenge to newcomers. The USDA Certified Organic standard requires nontrivial amounts of paperwork and record-keeping, which specialized service providers can help track and complete.

Pipeline Foods, another service provider, emphasizes the power of farmer networks to share best practices and address any challenges that arise; it facilitates networking through workshops and online and in-person forums.<sup>33</sup> Dissemination of best practices through word-of-mouth is especially effective in dispelling some farmers' reservations about organic farming as an enterprise.

Organic farming can provide valuable diversification for many farmers. But diversification brings added complexity, especially at the outset. Service providers with specialized knowledge in organic transition are easing the burden of complexity and walking side-by-side with farmers through the process.

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## AgriSecure

Based in Blair, Nebraska, AgriSecure was founded by several 5th generation farmers to partner with farmers to successfully scale organic grain production. The AgriSecure platform simplifies the transition from traditional farming to organic farming with the goal of increasing producer profit potential and reducing risk from ongoing organic production.

AgriSecure provides farmers with production expertise, technology systems and on-farm support to successfully manage organic farming at scale. The AgriSecure program includes the end-to-end management of organic acres, including organic certification support, whole farm and field-level management, agronomic advice, proprietary data platform access, and marketing access. "We believe

AgriSecure has cracked the code on large scale, row crop organic farming: the AgriSecure program makes organic farming a viable commercial option for large scale commodity farmers," says Rhea.

In July of 2018, AgriSecure received a strategic investment from Farmers Business Network (FBN), who recognized several ways that AgriSecure could help enrich FBN's offerings. FBN counts organic farmers among its members and wants to better serve those members through enhanced input and seed offerings and improved marketing of organic crops. FBN's farm intelligence and data analytics platform will also give AgriSecure more tools to help large-scale organic farmers achieve the profitability that organic practices offer.



J.P. Rhea, CEO & Co-Founder, AgriSecure

# New Agricultural Technology: Optimization of Scarce Resources

Technology is integral to the modern farm. GPS-enabled machinery, remote sensing, and precision application have fundamentally changed how crops are grown. But technology also reaches far beyond cultivation practices to influence farm management—from the purchase of the inputs to the marketing of product, and all the decisions in between. Advanced information technology allows farmers to optimize resource use (whether land, water, or inputs) and achieve greater profits, which is especially crucial for farmers switching over to organic.

## Software

As discussed above, organic farming requires an entirely different set of cultivation practices than conventional methods. Managing these unfamiliar practices can be eased by innovative software.

For example, software applications help farmers optimize their resource allocation by improving insight into soil quality. Maintaining healthy soil is central to farm productivity, and this is doubly true on organic farms, which operate with fewer chemical options for fertility or soil health. Soil testing provides feedback on ground fertility after a harvest and helps prep for the subsequent planting season. In recent years, many farmers have transitioned from traditional random sampling to using specialized software like FarmLogic's Soil Test Pro<sup>34</sup> to facilitate grid sampling, where samples are drawn and processed in a more specific and intentional way to ensure a diversified analysis of the land. Once a farmer has better soil intelligence, he/she can use mapping technology coupled with automated planters to optimize the allocation of resources across the land and improve yields.

## Hardware

Among the many stipulations of organic farming is a prohibition on certain chemical herbicides, which are ubiquitous in conventional practice. As a result, organic farms must find alternative methods for weed control, and robotic weeding machines are an increasingly relevant option. Inter-row weeding robots have been marketed for some time, but advanced robotics and camera technologies are now opening up the possibility of autonomous weeders with “smart” capabilities such as plant identification and targeted removal.

Robotic hardware also plays an increasing role in growth monitoring, disease/pest detection, in-field navigation and transportation, and other manual and repetitive tasks. Automation benefits accrue to all methods of farming. Robotics specifically designed for agriculture are expected to exceed \$11 billion in sales by 2023.<sup>35</sup>

## Big Data

As discussed above, much of the challenge of transitioning to organic is, at its heart, an information problem. Farmers recognize all the hypothetical benefits, but they want to know—How will I know the right cultivation techniques for my land? How hard will it be to buy organic inputs and sell my crops? How can I know whether my farm is performing well?

'Big Data' and analytical platforms can go a long way toward answering these questions. The aggregation of key farm metrics such as input pricing, yields, and crop prices allows farmers to plan, negotiate, and collaborate for the purpose of maximizing farm profit and effectively managing resources. Farmer-focused data democratizes access to information historically only held by large agricultural firms, who leveraged it to promote their own products, platforms, or services. With new data tools at their fingertips, individual farmers stand on more equal footing with the agribusiness behemoths.

Farmers Business Network (FBN) has created a platform for farmers to share anonymized agronomic data, aggregate their purchasing power for seeds and inputs, and uncover new marketing opportunities. FBN offers products and services specifically tailored to the organic farmer, including input sales, crop marketing, and educational tools. Its investment in AgriSecure (see box above) and its partnership with the educational organization, No-till on the Plains, are just two of FBN's partnerships aimed at supporting transition to organic and other regenerative growing practices.

*Farmers Business Network (FBN) has created a platform for farmers to share anonymized agronomic data, aggregate their purchasing power for seeds and inputs, and uncover new marketing opportunities.*

## Creative Funding: Mobilizing Capital to Encourage Organic

As previously detailed, among the most significant barriers to transitioning from conventional to organic farming is the relatively high financial cost and risk. A complete transition takes a minimum of three years and usually involves a decline in yield, an increase in labor and regulatory costs, and insignificant price premiums until year four. While some farmers can self-finance or utilize existing lending infrastructure, these options aren't suitable and realistic for everybody. Recognizing the partnership opportunity, several entities have emerged to provide capital and financial risk management tools.

### Investors

The "patient capital" of institutional investors is ideally suited to funding the transition to organic farming. This strategy typically involves buying and operating the farmland outright, but in cases where the purchase is paired with a "lease-back" or other management agreement (i.e. the former owner continues to operate or lease the farm), the investment capital enables an operation to transition that couldn't otherwise. Sustainable Farm Partners is one such investment manager; it purchases commodity farmland, secures organic certification, invests in infrastructure, and increases crop diversity in partnership with a farm operator, who has first right of refusal to buy back the farm after transition.<sup>36</sup>

*The “patient capital” of institutional investors is ideally suited to funding the transition to organic farming.*

Iroquois Valley Farmland REIT takes a different angle by buying targeted parcels of farmland, then leasing them to organic farmers for longer terms than the industry standard of 1 or 3 years.<sup>37</sup> With a long-term arrangement in hand, farmers gain the certainty they need to invest in the infrastructure or process changes required for organic certification. And for farmers looking to expand or purchase land that they’ve previously leased, this style of investment can free up capital to be used for organic transition that would otherwise be tied up in land equity. The same profit arbitrage opportunity that makes organic transition appealing to the farmer-owner will attract an ever-growing amount of private capital, too.

## **Insurers**

Crop insurance in the U.S. is the farmer’s top financial risk management tool, and as such, it is offered by the USDA at subsidized rates. Only in recent years, however, have the product offerings evolved to adequately protect organic farmers during and after the transition from conventional farming. In particular, in 2016, the USDA amended its policies to offer transitional and already-certified organic farmers’ policies which better reflected the premium value of organic crops; previously, transitional farmers only had financial protection up to the price level of conventional crops, which increased their financial risk during those transition years.<sup>38</sup>

Product offerings are only part of the story. Crop insurance is marketed and sold nationwide through independent insurance agents, and these agents’ expertise has outsized influence on the effectiveness of new product offerings. Farmers Business Network recognizes that good information is paramount to risk management decisions, and in late 2018, launched FBN Insurance to bring its resources and data analytics to the insurance world.<sup>39</sup> The aim is to let technology improve decision making and increase farm profits, which (among other impacts) will decrease the financial risk associated with organic transition.

## **Food Companies and Retailers**

Companies all along the food value chain have recognized their own power to encourage organic transition back at the farm level. One of the clearest examples is Ardent Mills, the nation’s largest flour supplier. Back in 2015, Ardent Mills partnered with the nonprofit advocate and certifier Oregon Tilth to launch its ‘Organic Initiative 2019,’ a pledge to help American wheat growers double their organic acres harvested by 2019. When farmers join the initiative, they receive direct support services from the company, networking and workshop opportunities, and long-term contracts for transitional and certified bushels.

The cereal maker Kashi saw the same opportunity and responded in 2016 with the creation of its own “Certified Transitional” protocol,<sup>40</sup> which incentivized organic transition among its farmer-suppliers by committing to pay a price premium even while the farms remained in transition. The protocol can be applied to a wide variety of crops—wheat, cotton, strawberries—and by also being featured in Kashi’s product marketing, helped link the consumer to organic farming more directly.

Perhaps the most direct financial assistance approach is exemplified by the grocery wholesaler Costco, who in 2016, began a program to offer land and equipment financing to organic or transitioning farmers.<sup>41</sup> Because they are the bridge between organic farms and the booming consumer demand for organic food, food and grocery companies can be expected to continue taking a direct interest in easing the organic transition.

## Other Lenders and Grantors

Fortunately for a farmer eyeing the organic transition, the list of other organizations offering creative financial assistance is long and growing. Regional nonprofits like Craft3<sup>42</sup> offer loans to transitioning farmers, and farm co-ops like Lakewinds<sup>43</sup> set aside grant funding to alleviate transitional costs. Of course this is all in addition to the federal organic transition resources available through the USDA's Farm Service Agency, which include low-interest loans, assistance with the certification process, and reimbursement of the actual cost of certification.<sup>44</sup>

Tracking and comparing all the available resources is, in itself, a challenge—so organizations like the Rodale Institute<sup>45</sup> and initiatives like the USDA-funded *Tools for the Transition* project<sup>46</sup> aim to educate farmers and increase the accessibility of various financing tools.

# CONCLUSION

It is often said that farmers are the consummate small business owners. Success requires the handiwork of a machinist, the prudence of an investor, the insight of an agronomist, and most of all—the grit of an entrepreneur.

Making the transition from conventional to organic row crop farming encompasses all these skills. Fortunately, farmers don't have to go it alone, nor in the dark. As awareness grows of the economic and ecological boons from organic practices, farmers are supported by a swell of innovations.

For the *machinist*, advanced robotics and software will allow 21st century farmers to increasingly replace the 20th century fossil-heavy model.

For the *investor*, more creative capital is available than ever before to facilitate and de-risk the transition to organic.

And finally, for the *agronomist* and *entrepreneur*, solutions like those offered by Farmers Business Network collect and crunch the data that reveals the power of organic to earn farmers more profit in many situations. 'Big Data' comes to the farm and replaces ideology or misconceptions about organic with actionable recommendations based on statistics and data analytics.

The old is meeting the new. Together, these innovations could enable a U.S. organic farming renaissance with benefits for consumers, farmers, and our planet.

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