[Last Updated: Mid-July. We iterate quickly as we learn from farmers and investors alike, but the core model will always be maintained. The 4-6 pagers that accompany this are updated weekly. Please email "brandon@madagriculture.org" for the latest version and he'll gladly provide you with one.]

# Catalyzing a Regenerative Agriculture Revolution

## // EXECUTIVE SUMMARY

Agriculture largely defines our relationship to the Earth. Yet, agriculture has progressively subverted the economy of nature, degrading planetary ecosystems and creating some of the largest challenges humanity has ever faced, like climate change and the loss of fertile soil. The modern tragedy of the earth system is calling us to heal our relationship to Earth and one another. Regenerative agriculture is humanity's response to radically change how we grow food and fiber to reverse climate change and heal the damage we've done to global ecosystems and ourselves.

Here, we outline a model, theory and action plan for catalyzing radical reformation of agriculture from a model of working against nature to working with nature to produce food and fiber. Farmers and ranchers are the stewards of the land and they need support. Our primary goal is to help farmers and ranchers adopt regenerative agriculture to produce healthy food and fiber that restores the earth and creates ecological and economic wealth. Such a vision is difficult to realize when up against the present food system, built and operated on the extraction of natural capital and human health. Nevertheless, such a revolution is paramount to the immediate and long-term well being of humanity and Earth.

Our model blends rediscovered virtue, the power of community and soil, place-based design, repurposed money, and the reinvention supply chains - from soil to shelf - to create a holistic and total change of the agricultural system. While daunting, any system can rapidly reconform with catalytic strategy and investment. Remember the Green Revolution was funded with less than \$50M from the Rockefeller, Ford and Kellogg Foundations, as society was primed for rapid adoption of industrialization during post-war economy and the rising wave of technology, mechanization, and corporate control and consolidation, and neoliberal capitalism. A perfect storm of social, environmental and economic factors are aligned for another major revolution in agriculture. Rural economy is grim, climate change threatens our existence, neoliberalism capitalism and corporate control over farming is faltering. Out of great pain, great innovation occurs. The conditions for change are perfect.

The regenerative revolution is underway, but it needs fuel and a strategy to generate rapid and widespread change. Our process begins with designing regenerative agricultural systems that optimize the creation of ecological and economic wealth. We activate farm and ranch plans with three catalytic levers, which include:

**LEVER 1: Know-How, Wisdom & Community.** Provide farmers and ranchers wisdom and a community of change. Technical assistance and a community of support for change. Farmers are not alone, but might. Mad Agriculture is the glue. Providing an on-ramp to regenerative for everyone.

**LEVER 2:** Flow Regenerative and Fair Capital. Innovation in regenerative agriculture is cash limited. Producers are saddled up to debt and insurance obligations that reinforce a broken system. We need new lines of capital to subvert these systems, and offer the freedom and support to break out of the industrial reality. We need to repurpose money, reinvent investment and serve the earth, not destroy it. We believe that capital needs to flow back to the earth, enabling the caretakers of the soil to steward the land and produce healthy food. The age of adding money to money by virtue of having money to create more money is a dying strategy for creating a healthy planet. Money produced by the extraction of natural and human resources denigrates society and creates injustice

and inequity. Money must be used to restore what is sacred and flow back to the earth and soil. We must use capital toward a different investment goal: the restoration, and not the more efficient exploitation of the natural and social commons. Soil is the foundation of true wealth, and our reinvestment in the Earth and humanity must begin there.

**The Perennial Fund** is that solution, coupled with public funds from the NRCS and others that are ready and want to flow to the land, but don't know how. We need efficient mechanisms to deploy billions of dollars that encourage and reinforce farmers and ranchers already practicing and ready to adopt regenerative agriculture. This White Paper outlines a model of change provides a framework for how billions of dollars can flow into regenerative agriculture.

**LEVER 3:** Activate Premium Crop and Ecosystem Markets. Principles are Diversity, Volume, Transparency, Longevity and Value embodied within Specialty Markets, Organic Premiums, and Ecosystem Services (Carbon, Water). Enter markets where farmers help determine the value of their work, not subject the whims of the free market, where the price of food is tied more closely to oil, trading futures and perverse subsidies that scaffold a faltering system.

The industrial farm economy is grim: farm income is at an 18-year low and commodity prices are bottomed-out. Yet, there are a variety of bright spots in the marketplace to pursue, including specialty crops, organic certified production, and direct offtake to brands that seek direct connections with farmers. For example, the demand for organic small grains and corn has seen double-digit growth year-on-year for the past decade, with 200-400% premiums. Shifting to organic is a big transition, and Mad Agriculture can help guide that process for interested farmers. Mad Agriculture and our community of change is deeply connected to natural and organic food markets and brands working to regenerate their supply chains and pay premiums. We are actively connecting brands directly to farmers, and we will offer these market connections to Boulder County farmers on a farm-by-farm and crop-by-crop basis.

This White Paper outlines the power of mobilizing capital into a regenerative agriculture revolution. Here, we clearly demonstrate the power of allocating of money into regenerative farm systems, when coupled to deep and committed sharing of risk, to create disproportionate ecological and economic wealth. What follows is an opportunity for The Perennial Fund to reinvent the purpose of money by restoring the vibrancy of both human and natural economy.

# // THE PROBLEM

#### Industrial Agriculture, the Collapse of Rural Society and the Escalation of Ecological Crisis.

Agriculture was developed as dominion over nature through the development of systems to create ease and efficiency for cultivation, planting, harvesting and distribution. These innovations have created unintended outcomes for ecosystems and natural support systems that humanity, and all of life, depends on. Agriculture has undergone a series of revolutions that have progressively detached us from the natural systems we depend on. Industrial agriculture has damaged humanity and the Earth in profound ways.

Modern food production has caused the conversion of grasslands and rainforests to fields of wheat and soy, reduced global biodiversity, eroded soil health and increasingly depends on fossil fuels and chemicals to plow, plant, fertilize and harvest food. These 'efficiencies' of the industrial system are efficiently destroying the systems they do not not consider on their balance sheets. The industrial food system is failing humanity and the earth.

# "For the true measure of agriculture is not the sophistication of its equipment, the size of its income, or even the statistics of its productivity, but the good health of the land." -Wendell Berry

Industrial agriculture is run by the principles and desired outcomes of neoliberal capitalism and corporate power, which have synergistically and profoundly altering agriculture over the past 70 years. Profit-seeking corporations have gained extreme control over the heart, soul and resources of farm and ranching communities. Large multinational corporations control the inputs producers depend on to produce crops and the prices farmers are paid for those crops at the market. Farmers are being squeezed by the rising cost of inputs and services, while commodity prices decline or remain stagnant, creating very little flexibility to take risks to find solutions and ways to break out of the system. Corporations increasingly push risk onto farmers, coddling them into inputs and services that band aid exposure to ecological and economic volatility in a food system that operates in a state of emergency.

The crisis is omnipresent, though it can be hard to see because more and more people are flocking to urban areas, while rural community suffers. Small towns are boarded up and people are leaving in droves. The commoditization of food has dehumanized food production. Commodity supply chains hide tremendous damage and injustice done by the consumption patterns of society. Consumers are effectively blind to the destruction they caused in consumption.

## How bad is it?

- Since 2013, farmers' net income has fallen by 50% with the expected median income to be -\$1,449 in 2019.<sup>1</sup>
- Eighty percent of rented farmland (283 million acres, 30% of all farmland) is owned by non-operator landlords, those that own land used in agricultural production but are not actively involved in farming.<sup>2</sup>
- The impact of obesity and overweight on the U.S. economy has eclipsed \$1.7 trillion, an amount equivalent to 9.3% of the nation's gross domestic product.<sup>3</sup>
- The USDA has estimated that 50 million people in the United States obtain their drinking water from groundwater that is potentially contaminated by pesticides and other agricultural chemicals.<sup>4</sup>
- Since the dawn of agriculture 10,000 years ago, land use conversion has oxidized some 516 billion tons of biosphere C (SOC, vegetation, wetlands) to CO2 (Lal, 2016), equivalent to 34 years' worth of total global GHG at current emissions rates.<sup>5</sup>
- Annually, agriculture in the U.S. is releasing 8.2 MMT CO2, 248.7 MMT methane, and 285.2 MMT nitrous oxide, contributing 9% of total U.S. GHG emissions.<sup>6</sup>

Industrial agriculture is accelerating climate change. Climate change is wreaking havoc on Earth ecosystems and is now the primary driver of human conflict. The planet is on a trajectory to warm 3-5°C by 2100<sup>7</sup>, which will usher untold changes to the earth system from soil to the sea. Climate change is the greatest threat to human civilization and the ecological integrity of the earth, and represents the penultimate outcome of our modern and imbalanced affair with nature. While agriculture has always been a major driver of climate change, the impact of the Green Revolution has turned up the heat. With the advent of synthetic fertilizers, nitrogen applications are the largest source of N2O emissions, a GHG with 298 times the warming potential of CO2.<sup>8</sup>

Regenerative agriculture inverts the industrial economy, and rebalances the global biogeochemical cycles (i.e. carbon and nitrogen) by shifting the economy of extraction to the economy of giving, and in that reciprocity,

<sup>&</sup>lt;sup>1</sup> <u>https://www.ers.usda.gov/topics/farm-economy/farm-household-well-being/farm-household-income-forecast/</u>

<sup>&</sup>lt;sup>2</sup> https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-ownership-and-tenure/

<sup>&</sup>lt;sup>3</sup> https://www.sciencedaily.com/releases/2018/10/181030163458.htm

<sup>&</sup>lt;sup>4</sup> https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2946087/

<sup>&</sup>lt;sup>5</sup> <u>https://ofrf.org/sites/ofrf.org/files/staff/Climate\_Guide\_FINAL-F\_WebRes.pdf</u>

<sup>&</sup>lt;sup>6</sup> https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

<sup>&</sup>lt;sup>4</sup> https://climateactiontracker.org/global/temperatures/ 8 https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

nourishing ourselves through the natural outcome of healthy food as a result of investing in healthy soil. It's an uphill battle, for now. There are trends to suggest these problems will get worse before they get better.

- 1) Rising urbanization. The rise in urbanization will continue to create supply chains that ignore how food is created, and at what ecological and social cost.
- 2) Rising Corporate control and ownership.
- 3) Commoditization of food and free market exposure. The farm bill will likely double down on subsidies on commodities. Exposure to global markets takes away the control over value for the farmers, making them a pawn in the game of higher powers, and subject to forces way beyond their control.
- 4) A missing generation. The average farmer is 58 years old . Small landholders are the next generation of succession.
- 5) Global economic development. The 'developing' world is following America's model of economic growth. The rest of the world, through globalization and 'development' is following the American model, and on track to consolidate agriculture into corporate control.

We must find ways to subvert and disrupts these trends. Farmers are sick of the system. But they are isolated, in many ways, abandoned and alone. How does a farmer or rancher change? What is the alternative? Who will lead the change?

# // BREAKING OUT OF THE SYSTEM USING ORGANIC MARKETS

#### Organic and Regenerative Markets

The rise of organic food consumption is rapidly creating the demand to encourage organic supply. A supply of certified organic farmland that is capable of meeting this demand hasn't been able to keep up.

In 1997, organic food sales were pegged at \$3.4 billion; 2017's sales of over \$45 billion reflect a growth of nearly 15 times. In the last decade alone, the U.S. organic market has more than doubled in size.<sup>9</sup> 5.5% of the food sold in retail channels in the U.S. is organic, yet organic farmland only represents 6.5 million of 911 million total acres in the United States.<sup>10</sup> <sup>11</sup> <sup>12</sup> With supply representing only 0.7% of farmland and demand at 5.5% of food sales, there is a gap that creates a premium. For the time being, the US has relied on importing most of its organic food. Leaving a massive opportunity for local production. This shortage is not a result of unproductive organic farming, as some would assert, but a lack of farms and acres breaking free from chemical dependency.

The organic premium ranges from 100% to 500% over conventional, typically falling in the 100% to 200% range for most commodity grain crops.<sup>13</sup> <sup>14</sup> Since organic per-unit costs rarely exceed 1.5X that of conventional and organic crops generally require fewer inputs per acre, a farmer's net margin typically increases 3x-6x depending on their operation's crops, rotation, region, and operators skill.<sup>15</sup> <sup>16</sup> In any given year, organic yields are generally 5% to 20% lower than conventional yields. However, during times of extreme drought or heat, organic systems produce yields up to 40% higher than conventional systems due to improved soil health.<sup>17</sup> <sup>18</sup>

<sup>&</sup>lt;sup>9</sup> https://ota.com/news/press-releases/20236

<sup>&</sup>lt;sup>10</sup> <u>https://ota.com/news/press-releases/20236</u>

<sup>&</sup>lt;sup>11</sup><u>https://www.agupdate.com/farmandranchguide/news/crop/us-boasts-million-acres-of-organic-certified-land-with-new/article\_3f60bdbe-d16</u> <u>9-11e8-a62c-9743fccce7ec.html</u>

<sup>&</sup>lt;sup>12</sup> <u>https://www.pewresearch.org/fact-tank/2019/01/10/organic-farming-is-on-the-rise-in-the-u-s/</u>

<sup>&</sup>lt;sup>13</sup> https://organicbiz.ca/organic-price-quotes-late-april-4/

<sup>&</sup>lt;sup>14</sup>https://www.ers.usda.gov/amber-waves/2016/may/investigating-retail-price-premiums-for-organic-foods/

<sup>&</sup>lt;sup>15</sup>https://rodaleinstitute.org/science/farming-systems-trial/

<sup>&</sup>lt;sup>16</sup> https://www.landfundpartners.com/organic-investments/

<sup>&</sup>lt;sup>17</sup> https://www.motherjones.com/food/2012/07/what-organic-ag-teaches-us-about-feeding-ourselves-while-planet-heats/

<sup>&</sup>lt;sup>18</sup> https://rodaleinstitute.org/science/farming-systems-trial/

In 2017, Encourage Capital, a firm managing roughly \$250+MM completed a comprehensive study assessing how the NRCS can engage impact investors. One of the possibilities is transition to organic, which outlined the comparative returns of conventional, transitional, and organic.<sup>19</sup>



Along with capturing a market premium, organic agriculture also relies on significantly less agrochemicals. These insidious chemicals contribute significant harm and sometimes death to people who apply or consume them, not to mention their effects on waterways, animals, and insects. Organic agriculture without the coupling of regenerative management practices can sequester 1,464 - 2,196lb/ac/year of CO2. When stacked with various forms of no-till, cover cropping, and rotations, ideal regenerative cropping systems can sequester up to 8,784lb/ac/year. That's  $\sim$ 4mT per acre, more than your car releases per year.

Organic may seem like a holy grail; price premiums coupled with environmental benefits. Looking back through history we find that "organic" isn't a holistic solution and caused the Dust Bowl of the 1930s. In a time before chemical management, mechanical tillage was the typical means to eliminate weeds and improve crops' access to fertile soils, but it comes at a great cost. Tilling the prairie led to massive wind and water erosion, blowing dust as far as New York City. Organic eliminates the use of synthetic chemicals, stopping nitrous oxide emissions from fertilizers and the application of cancer-causing herbicides and pesticides, but it's not a replacement for deep-rooted perennial prairies that used to rule the midwest.

# There is a broad spectrum that spans from degenerative to regenerative in the many facets and characteristics of all food production:

<sup>&</sup>lt;sup>19</sup> http://encouragecapital.com/wp-content/uploads/2017/09/EC\_Private-Capital-Report\_Reduced-Size\_091417.pdf

# **Agriculture: A Continuum**

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	Economic Sustainability	All forms of agriculture can achieve financial-capital profitability										
	Ecologic Sustainabilty	Low - Degrades Ecosystems Increases >>> High - Enha	High - Enhances Ecosystems									
44000000000000	Diversity	Extremely Low Increases >>>	High									
Characteristics	Resilience	Extremely Low Increases >>>	) High									
	Waste & Polution	High Decreases >>>	None									
	Crops / Products	All crops can be grown degeneratively or regneratively										
	Source	International National Regional Local	Farm									
1000	Fertility	Chemical Manure Plants Compost Humanure	Ecosystemic									
	Fuel	International Fossil Fuel Domestic Fossil Fuel Biofuels Regional Local	) Farm									
mputs	Equipment	Produced: Internationally Domestically Regionally Lo	ocally ) ?									
	Seeds / Animals	Geneticaly Modified Nationally Produced Regionally Produced Heirloom Hybrid & Open-Po	orid & Open-Pollinated									
	Tillage	High Tillage Low-tillage	No-tillage									
	Pest Management	Broad-Spectrum Pesticide IPM Biological Cultural	Ecosystemic									
	Disease Management	Broad-Spectrum Biocides IPM Biological Compost-Biological Cultural	Ecosystemic									
Practices	Animal Management	CAFO Continual Rotational Grass-fed Multi-Species Holistic Ma	inagement									
	Crop Patterns	Single-crop Monoculture Many-crops Polyculture	Integrated									
	Guiding Frameworks	Industrial Conventional Diversified Organic Agro-Ecology Biodynamics Agroforestry Carbon Far	rming sure ?									
		Degenerative Rege	nerative									

20

Organic needs to improve. It is simply a stepping stone on the journey to improving soils' regenerative capacity. At Mad Agriculture, we want to live on an Earth that is good for all. Moving from conventional to organic to a regenerative and organic system is one way to deliver this change. It would be overly-ideological for us to only focus on taking growers to regenerative organic regardless of where they are on their journey. It's ideal, but not practical. That's not where the help is most needed. We envision that lifting those up that need the most help will drive the largest positive change, and ultimately this will start with the early adopters and early majority. It's where the work needs to be done to shift the extremes and propel the entire system forward.

The organic premium can be combined with cost savings from adopting more regenerative practices that improve soil health to bolster an even higher net profit. A study of regeneratively-managed corn farming operations in the central U.S. found that these practices led to greater profitability per acre than similar conventional farms. In spite of lower yields, the regenerative operators received 78% higher net profits, largely due to lower input costs and alternative marketing.<sup>21</sup> To further increase the cost savings, adoption of conservation practices outlined by the NRCS can enable EQIP funds to cover upwards of 100+% of the cost of implementation.

#### Regenerative practices + increased premiums + reduced costs + more consistent yields + a happy farmer

Ecological + economic resilience

<sup>&</sup>lt;sup>20</sup> https://medium.com/@ethansoloviev/regenerative-agriculture-continuum-4346f78dde3e

<sup>&</sup>lt;sup>21</sup> https://peeri.com/articles/4428.pdf

# // BARRIERS TO ENTRY

If only getting off the industrial superhighway and back onto the country road again was easy.

Change is hard for most farmers because margins are tight, capital is limited, and markets are narrowly defined. Moreover, the modern agricultural economy and culture is inextricably woven in with corporate and governmental interests that control the supply and pricing of inputs (i.e., seeds and chemicals) and outputs (i.e., commodity pricing), as well as insurance and subsidy programs. Though many farmers are frustrated and exhausted by the current system, there is limited flexibility to try something new because of major barriers to adopting new products, practices, and market strategies.

Transitioning conventional farmland to organic through the lens of regeneration is resource intensive and takes time. It takes many forms of capital to successfully transition. Integrating financial, natural, constructed, human, and social capital are all absolutely necessary to "bet the farm" and go for it. If a single piece is missing, the road to organic becomes exponentially tougher.

"The biggest challenge for farmers is the fact that conventional production is mainly a plug-and-play system: if I have this problem, I use this product. Whereas organic production requires more intricate management and you need to have a different set of management skills. It requires you to observe everything because everything is interrelated: pollinators, soil health, wildlife, nearby water sources, etc. It's a big leap and it can feel like a lot to learn." Zoe Schaeffer at the Rodale Institute

#### Financial:

- **Trough** For farmers to transition from a chemical system to an organic system, they must not apply any prohibited substances to their land for 3 years (synthetic pesticides, herbicides, fertilizers, and others). When the biology of the land is dependent on chemical drugs, going cold turkey can result in decreased yields. Adding to their woes, during the 3-year transition, farmers can only sell at conventional prices. Combining decreased yields and conventional prices almost guarantees that farmers' net margins will be negative. Can you imagine not making money for 3 years? We call this the organic valley of despair.
- Insurance Organic growers will have to re-navigate the world of crop insurance, finding a new policy through the Risk Management Agency (RMA) that works with organic growers. Depending on the size and complexity of the operation, Whole-Farm Revenue Protection (WFRP) can be a reliable option, but not all operations qualify for WFRP.
- **Operating Capital** Farmers' operating capital has been decreasing over the past 10 years because commercial lenders are requiring increased collateral, hiking interest rates, and rejecting a higher percentage of loans to hedge against decreasing farmer net income.<sup>22</sup>
- Working Capital Farmers' lines of operating capital are being squeezed, resulting in less working capital (working capital = short term assets short term liabilities). This hinders farmers without enough liquidity independent of an operating loan to pay their fixed costs (land rent, mortgage, equipment interest). Having low levels of working capital (sub 15% of gross revenue) leaves farmers at risk of cash flow shortages when inevitable unexpected expenses come up.
- Access to Markets Generally, farmers are used to finding a way to transport their grains to the nearest elevator and selling it. They never know who will buy or eventually consume their hard-earned grain. In the

<sup>&</sup>lt;sup>22</sup> https://www.agriculture.com/farm-management/finances-accounting/farmers-working-capital-drops-to-10-year-low

organic system farmers have to sell to the nearest organic elevator or store their crops on-site and sell directly to a buyer who sets up logistics. The latter is difficult. It involves deep relationships with brands who trust the source and want reliable quality standards.

• **Debt Obligations** - Farmers often have massive debt obligations including a mortgage on their house and/or land, loans for equipment to plant, maintain, and harvest, operating loans that are used as lines of credit for working capital at the beginning of the season, and potentially other debts. Depending on how risky the farmer is viewed in the eyes of the lender, they may have a high interest rate.

#### Natural:

- Soil Health When soils have depended on extreme amounts of synthetic inputs for decades, going cold turkey is a difficult mentality for the farmer to adopt and for the soil to endure. Transitioning to organic takes careful planning to replenish the ecological health of the soil microbiome while reducing the risk of a catastrophic crop failure. In general, farmers see a reduction in yield during the transitional period.
- Climate Change With changing climate conditions, farmers face added uncertainty. Climate change is predicted to cause more frequent, intense storms and drought events<sup>23</sup>. Rising temperatures, as well as heat waves, may stress crops and livestock in ways that farmers are unused to. Any combination of these factors could cause farmers to question whether an additional change to their enterprise is a good idea.

#### Constructed:

- Logistics Broad acre commodity farmer's are used to hiring a truck to pick up their grain, transporting it to the elevator to sell or store then sell, and receiving a check. All of a sudden, when a farmer transitions to organic, they don't have the convenience of simply delivering their grains 10 miles down the road. They might need to hire a truck to deliver their grains 100 miles away, load a railcar, and have an advanced contract set up with a buyer. Logistically getting the crop from the location of production to the seller is a significant challenge most farmers are not equipped for or interested in.
- Grain storage, transportation, and processing The infrastructure system throughout the United States has been set up to handle conventionally produced crops. This creates friction because organic crops can become contaminated with conventional substances. For the same piece of equipment to touch organic produce after coming in contact with conventional, it has to be taken out of operation and washed downed to meet the organic standard operating procedures for decontamination. This increases the difficulty for farmers to store their crop and increases the distance needed to transport the crop to a processing facility capable of handling organic products.

#### <u>Human:</u>

- Know-How -It takes careful planning to understand a farmer's vision and goals for the future, to deeply know the land, understand which crops and practices will regenerate the soil while reducing market volatility, map in space and time the diverse rotations necessary to hedge climatic and market risks, and maximize the chance of all stakeholders succeeding. The knowledge of transitioning a farm is both unique to the specific farm yet rooted in universal principles.
- Determination Not everyone is ambitious enough to pick up all of the new skills it takes to be an organic farmer. Pick any field and there are folks who are destined to be leaders and folks who are complacent followers. They each have their place, but to reach the top position in any context, it takes a thirst for personal growth and high expectations. Learning from mistakes, learning what is working for others, and being innovative are all a part of going from conventional to organic. The most important piece of the puzzle is for the farmers themselves to have the wherewithal and grit to be persistent through difficulties while continuing to learn and innovate their farming operation.

<sup>&</sup>lt;sup>23</sup> https://www.ipcc.ch/site/assets/uploads/sites/2/2019/02/SR15\_Chapter3\_Low\_Res.pdf

## Social:

- **Culture** To be the only farmer planting a cover crop in the fall while all of the neighbors are laying down gallons of herbicide can make one an outcast as a 'weed farmer' in a once familiar and welcoming tribe. It creates serious bouts of self doubt, taking persistent courage to keep moving forth. Some chemical loving and dependent conventional growers think organic is going back to the dark ages. Really, this is a glimpse into their own ego, demonstrating a lack self confidence because they don't have the tools (growth mindset, work ethic) to pursue a path capable of regenerating value in their own lives and the land. Being surrounded by your peers with most of them being skeptical and saying you're wrong is profoundly demanding and difficult to internally manage. This culture varies county by county depending on other organic successes.
- **Network** Because there are so few organic operators, transitioning producers risk losing the support and knowledge network they may have previous depended on. If there are not other organic farms in the area, the farmer won't have access to practitioners that know the best management practices for the local conditions.

# // PROPOSED SOLUTION: A model and theory of change.

A paradigm shift in agriculture is required. We need a revolution that eclipses the virtues, strategy and outcomes of the Green Revolution. Our goal is to help farmers and ranchers thrive ecologically and economically with regenerative agriculture. Below is a basic schematic of our model of change. More details on this system to come. We look forward to sharing more details our core system of design and how we use catalytic levers to create change. The model:



# The Core: Plan & Activate Regenerative Agriculture.

# Lever 1: Carbon Farm Planning, Curriculum and Training for the Widespread Transition to Regenerative and Organic Agriculture.

Carbon Farming Planning is a new form of Conservation Planning that focuses on carbon and soil health as the foundation of agroecosystem health. Carbon Farm Plans optimize the use of carbon-beneficial conservation

practices (e.g. cover crops, no-till farming, prescribed grazing, forage planting, irrigation improvement, composting and more) to create healthy and diverse agroecosystem that are resilient and productive. Project partners have produced over a dozen peer-reviewed and published papers contributed to models used at the national and international scales. Carbon Farm Planning has been developed with significant NRCS support from staff, CIG and RCCP programs, as well as other private donors, and many partner institutions. A major barrier to scaling the success of Carbon Farm Planning is the lack of transferability of process and know-how to other organizations interested in adoption. The Perennial Fund will focus on cash-crop commodity agriculture on the High and Central Plains, yet develop documents that templatize Carbon Farm Planning and empower place-based design by other technical service providers. Short films will be produced <u>Michael Brown of Serac Films</u>, a 3-time Emmy-award winning documentary filmmaker, to socialize, attract and explain Carbon Farm Planning.

In this project, we will also continue our work in understanding how Carbon Farm Planning affects farm profitability, which is not well understood yet critical for evaluating and justifying investments in conservation practices. <u>Granular</u> and <u>MOSES</u> will help advance our understanding of the economics of carbon farming with their experience, business insights and software to on-farm agronomy. The Granular software platform will track and improve management using decision science and precision agriculture to collect and analyze data on yields, field performance and more.

#### Lever 2: Financing Organic Transition with Perennial Fund.

Money is the most important factor for decision-making in agriculture. Most producers operate on thin margins and are risk-averse. We've discovered that Carbon Farm Plans are difficult to implement because producers need additional capital beyond EQIP funds to help finance the operational, equipment and/or infrastructure needs that are associated with the adoption of new crops and practices. Traditional lending institutions lack the appetite to finance the early stages of a regenerative and organic agriculture, as the financial returns of Carbon Farm Planning are currently not well known. Yet, to mitigate climate change and restore our soil it will take \$700 billion in estimated net capital expenditure over the next 30 years. A new type of capital is needed.

There is an enormous amount of capital (up to \$1 trillion) on the sidelines in a wide array of asset classes that could be mobilized for financing regenerative agriculture<sup>24</sup>. Soil Wealth, a recent study led by the Delta Institute and funded by a CIG grant, which examined investment strategy or criteria across investment asset classes, concluded that 'philanthropy and government funding have critical, catalytic roles to play in creating an environment for more private capital to be mobilized in support of regenerative agriculture that truly delivers on its environmental and social impact potential...we strongly recommend greater blending of private investment with catalytic sources of capital from philanthropy and government at multiple levels.'

In 2017, a report from the NRCS and Encourage Capital stated 'NRCS's funding alone will never be sufficient to address the persistent natural resource challenges that affect private lands, and each year the backlog of interest in NRCS programs grows'.

Here we are creating a new fund, called the Perennial Fund (PF), for financing Carbon Farm Plans that enables the transition to organic and regenerative farming. The PF is a blended financing approach designed to use USDA dollars as first loss capital to attract additional private capital to finance the organic transition trough (Figure 2), when farms often lose money during the period of lower yields and reinvesting in soil health, but when organic premiums can't be captured.

#### Lever 3: Using Organic Premiums and Carbon Markets to Accelerate Carbon Farming.

Carbon Farm Plans generate social and environmental benefits that enable producers to sell into value-add markets for regeneratively grown, non-gmo, traceability, organic, locally grown, and/or many others labels.

<sup>&</sup>lt;sup>24</sup> <u>http://www.croataninstitute.org/soilwealth</u>

<u>Fibershed's Climate-Beneficial Wool program</u> is a salient example of how Carbon Farm Planning enables value-add markets access: wool producers operating with Carbon Farm Plans can sell to <u>The North Face</u> <u>Climate-Beneficial clothing program</u>. Smaller specialty markets aren't available to everyone, especially farmers isolated on the rural High Plains. However, organic crops market and strong premiums are becoming widely available to cash-crop farmers.

Organic agriculture is more profitable than conventional production because of significant value premiums, which are driven by strong consumer demand outpacing supply. Pipeline Foods, the largest organic buyer in the US, has provisionally committed to long term forward-contracting agreements with the farmers financed by the PF for both transitional and organic crops. Other smaller organic buyers, like Timeless Food, are also committed to secure market offtake with participant farmers. The PF helps farms secure market off take for crops, which is critical for the long-term financial sustainability of the farm, as well as paying back the loan.

Ecosystem service marketplaces are developing to reward farmers and ranchers for the environmental benefits they create, such as water quality, climate change resilience, nutrient management and more. Farmers are very interested in getting direct payment for carbon sequestration. New carbon marketplaces are being formed to pay farmers and ranchers who sequester carbon dioxide from the atmosphere. <u>Nori</u> is a promising new marketplace for soil carbon, slated to launch in spring 2020, which is improving on previous models by shortening project development time, reducing transaction costs, improving the accuracy and financial efficiency of carbon measurement and verification.

For Nori, <u>CSU COMET-Farm</u> is already the central methodology for measuring, monitoring and generating certified reduction credits for soil carbon. Carbon Farm Planning also uses COMET-Farm and is naturally aligned as a tool to help farmers design, optimize and sell soil carbon gains as offset credits. Mad Agriculture is a data manager for Nori. We are currently generating Carbon Removal Certificates for farmers across 12,500 acres of farmland in CO, NE, IL and MT, helping them get paid for building carbon-rich and healthy soils that reduce climate change. We are also collaborating with <u>Quick Carbon, a Yale University project</u>, to empirically measure soil carbon and other ecological outcomes, to compare and refine COMET-Farm. Granular software will provide the platform to integrate agronomy, manage organic certification and farm plans for both COMET-Farm and Nori (Granular and Nori are already partnered and synced).

#### A Powerful and Modular System of Change

This proposal boldy brings together conservation planning, finance, and value-add markets into a scalable system of change (Fig. 1). Carbon Farm Planning is a key that unlocks many opportunities by activating financing and rewards for long-term investment in soil health and resource conservation. Importantly, each lever of change does not hinge on the success of another. For example, Carbon Farming can happen without the Perennial Fund, the CFP is applicable for non-organic and non-cropland systems, the Nori carbon marketplace can be accessed without a Carbon Farm Plan. Our levers of change and objectives in the Perennial Fund are modular, distinct, and create value independent of each other. Yet, when combined, they work together to create multiplicative benefits for the farmer, the land and rural economy by increasing the pace and scale of conservation adoption. We have built an ecosystem of partners, advisory and funders to bring these elements together and catalyze a rapid and widespread shift to organic and regenerative agriculture with carbon farming.

#### Theory of Change.

- 1) Meeting producers on their journey. Regeneration is a roadmap for all.
- 2) The Importance of Language and Common Ground. Our common ground is love of place and our commonwealth is love of land. We are very cognizant of the sub-movements within the tide of change, from Regenerative Organic to Soil Health to Conservation and No-tillers. Here, we show the diffusion of innovation curve and how semantics matter. The principes are the same, the language is tuned. For the widest swathe of folks, Freedom Farming is the framing. Our work can also be called, Carbon Farm

Planning, Regenerative Farm Planning, or the way of Biblical renewal of all creation, for it groans with the pain of reconciliation (Romans 8).

3) Farmers listen to farmers. In our investment model, we must develop ways to support the 'beacons of change', the 'lighthouses on the hill', to enable them, acknowledge their success, amplify it, and let other attract to their success. Farmers from each other learn at church, across fence and weed lines, gas stations, and, at best, field days.



**Why** - Current solutions embody a theme seen throughout modern society. We're treating symptoms without addressing the fundamental problems. Someone has a heart attack? Prescribe statins. The mentality of a quick fix that solves the immediate problem is first order thinking that temporarily allows a system to endure, while the deeper, root cause boils underneath. One day, the right trigger will over extend the capability of the quick fix, and the true underlying problem will cripple the entire system. Statins won't stop a heart attack when the elevator breaks and someone is forced to carry their groceries up the stairs. If only the fix addressed diet, exercise, and behavior change, all of the complications from statins and associated heart risks would have disappeared.

All of the currently considered solutions address a particular symptom of a broken system, not the underlying stressors eroding the food economy. These solutions almost never acknowledge that every barrier to entry is connected with all others creating multivariable complexity. To make meaningful change, a holistic, systemic solution is necessary.

In a whole-system solution, action must be timed right, easily distributed through the right channels, and targeted to those who have the power to make it all happen. The crest of the regenerative agriculture wave is breaking, and all of the pieces to design a scalable and equitable revolution are here. Mad Agriculture is putting the pieces together and accelerating this urgently-needed change. Using a principled approach to address the underlying ills of modern agriculture, we plan to mobilize the resources that will create a better farming system for all.

Principle	Practice
Systems-level change	Leverage widespread networks of trust, knowledge, infrastructure, and capital
Equity for all stakeholders	Consider outcomes for farmers, the planet, investors, agronomists, brands, and consumers
Skin in the game	Share exposure whenever possible to account for farmers' inherent stake and minimize tail risk (e.g. flooding, drought, market collapse, default)
Innovation	Employ tipping point solutions without being dysfunctional in the current economy

**Idea** - Lend farmers \$100 per acre per transitional year to go from conventional to organic in exchange for a 20% share of their net profit until 1.5x (\$450) is paid back, which is expected to take 5 years. This is known in the impact investing space as a demand dividend or revenue based financing.<sup>25</sup> The return is protected by a loan guarantee provided by NRCS EQIP funds and/or philanthropic foundation capital that matches the amount of capital at risk, typically 5%-20%. Along with getting paid for every acre in transition, farmers will be provided a free individualized regenerative farm plan, agronomic support, and access to premium organic markets to sell their crops. This puts The Perennial Fund's skin in the game by directly helping farmers, not unloading the risks onto farmers who are merely trying to survive.

The PF offers 10 year loans of flexible capital to cover the loss of operational cash flow, equipment and/or infrastructure needs. The PF loans \$50-200 per acre per year into the farm for 3 years to transition to organic in exchange for a 20% net profit share after they're certified organic until 150% of the initial investment is returned. The per acre investment amount is determined by the overall capital needed to facilitate a successful organic transition. We work with the farmer to determine the capital needs for successful organic transition using the financial proformas for Carbon Farm Planning we are actively developing to delineate the financial investments and expected returns of investing in conservation practices.

This model is dependent on two factors that increase a farmer's net revenue: reducing their costs through conservation practices and increasing their gross revenue through organic premiums. Profit margins are 3x-6x more for organic growers<sup>2627</sup>. Based on modeling and real world transition case studies, we are conservatively targeting a 4.14% year over year return for 10 years, equivalent to a 9% IRR over 10 years. This includes the 3 year transition period. For each pilot farm, we base the economics on an 8 year payback and build in 2 seasons of climatic buffer, 10 total years. In an ideal world, of predictable climate and stable markets we will achieve a 5.20% year over year return for 8 years, equivalent to an 11% IRR.

This model varies from other proposed solutions because it maximizes the potential for the implementation of more regenerative, ecologically aligned practices that can mitigate climate change while minimizing the downside risk for all stakeholders involved. The investors only get paid if the farmers do, putting everyone's skin in the game and sha0res risk across the system. This model utilizes existing networks of trust to leverage various forms of capital and provides the scale and diversity necessary to smooth farm by farm volatility.

<sup>&</sup>lt;sup>25</sup> <u>https://thegiin.org/assets/Santa%20Clara%20U\_Demand-Dividend-Description.pdf</u>

<sup>&</sup>lt;sup>26</sup> <u>https://rodaleinstitute.org/science/farming-systems-trial/</u>

<sup>&</sup>lt;sup>27</sup> https://www.landfundpartners.com/organic-investments/

Individualized regenerative farm plans maximize the likelihood of implementation by reducing friction across farmer access to capital, know-how, and markets. Taking this holistic account allows Mad Agriculture to pair each farmer with the best choices for their operation, within their individual context.

On the ground implementation is what we are aiming for here, not doing one thing well in the hopes that others will pick up the slack in the system. That plan has been ineffective to date. Outlined below are quick points that showcase how this solution addresses all barriers to entry.

#### The PF is highly innovative for these reasons:

Farmer First and Shared Risk. Repayment does not start until after the 36 month organic transition. Farmers do not pay back the fund until they are making net profits, known as a demand dividend or revenue based financing; investors only get paid once the farmer is making money, creating a long-term skin-in-the-game approach to ensuring win-wins. At the end of year 10, any capital that is owed by the farmer will be dissolved and forgiven. Land, infrastructure and equipment will not be used as investment security, only the crop will be used as collateral if a farmer reverts to chemical-based agriculture or reverses carbon-beneficial practices. The PF provides financing along with technical assistance and market development. We will use Granular to digitally manage the organic certification process.

Attracting Private Capital for Conservation. The PF attracts private capital by using NRCS dollars as first loss capital to improve the risk-return profile of direct farm investment. First loss capital is a credit enhancement provided by an investor or grant-maker who agrees to bear the first losses in an investment in order to catalyze the participation of co-investors that otherwise would not have entered the deal. Using this investment model will leverage NRCS monies to attract private dollars to accelerate Carbon Farm Planning, maximizing the impact of NRCS programs and funding for resource conservation. Every NRCS dollar of first loss capital into the Perennial Fund attracts and levers an additional \$10-14 dollars of conservation with private capital. The pilot fund will total between \$2,750,000 to \$3,750,000, with \$250,000 acting as first loss from the CIG grant, further outlined in methods.

Equitable Returns across the Value Chain. Farmers will see up to a 608% increase in net revenue per acre per year over a 5-7 year term while in repayment, and 790% amount increase per year after the loan is paid off. Investors will be paid back through dividends proportional to their equity stake. Investors will net a targeted 9-11% IRR9. The societal impact and risk-return profile of the Perennial Fund is attractive to philanthropic organizations (i.e. foundations and family offices), private equity and individual investors.

The Perennial Fund is the most capital efficient and grassroots model of farm investment. The average acre of cropland in the US is worth \$4,130. Most farmland investment models are based on purchasing the land and converting it to sustainable production. We are not in the business of turning farmers and landowners into managers. With the PF, a \$300/acre loan over 3 years can enable the same areal change as a \$4,130 purchase and conversion. This generates 13.8x more conservation per dollar, creating greater return on conservation investment and increases the on-the-ground impact of USDA programs.

Scalability and Transferability. The PF is a new financial vehicle for Farm Bill dollars to attract and deploy private capital, designed to be replicated by others. The PF could provide a mechanism and model for deploying the severely underused Conservation Finance program. The USDA has a variety of loan guarantee programs, and the Perennial Fund could be well suited to attract those monies. The PF can also work for regenerative chemical-based farmers that cannot access organic premiums, however the returns to the farmer and the PF depend more so on the cost-savings of regenerative agriculture, which are more difficult to quantify, rather than the increased revenues generated in certified organic markets. Targeting organic markets is the best way to test the payback model at scale.

Fund Management & Timeline. We are actively pursuing a partnership with several different finance institutions with deep fund management experience, which will handle the backend and legal aspects of the fund in cooperation with our board of directors, investment committee and advisory board that has deep experience with fund formation and management. In this pilot fund, no management fees will be collected. All costs will be supported by the CIG funds and philanthropic contributions. We are actively raising PF 1 through March 2020. After the 10 year fund period, the CIG grant and other first loss capital provided by the General Partner controlled by Mad Agriculture will be recycled into PF 2 and never used for profit, but only for deployment to farmers.



This diagram showcases how capital can flow into the fund from philanthropic capital creating a loan guarantee, investors seeking a return and The Perennial Fund with a 2 and 20 setup. Hurdle rate has yet to be determined, and may be very low or zero because a loan guarantee can make up the difference between investor expectations and reality. A diverse portfolio of farms in various regions will produce increased revenues from organic premiums, cost savings from regenerative practices, and carbon and water credits.

Iowa: Net Profit of Farmer and rePlant (\$100/acre/yr and 20% net revenue share for 5 years)



The above diagram showcased The Perennial Fund loaning the farmer \$300 distributed over 3 years and then sharing 20% of the farmers profits for 5 years after they transition to organic.

**Success in Unrelated Industries** - Similar models have successfully been implemented with <u>Income Share</u> <u>Agreements</u> (ISAs) for students getting a college degree or shorter degree programs for people learning to code (<u>App Academy</u>). ISAs are similar to a non-voting share in a company where an investor buys a share of a person's potential future earnings but can't decide on where or how they work post investment.

College education ISAs pay students' upfront college expenses in exchange for a share of their income after graduation. Interest can aim for an amount equivalent to 3-4% per year capped at 2.5x of initial funding for a 10 year time frame. These agreements can include downside protection, where a borrower wouldn't pay a percentage if they are making less than \$25,000 per year. Groups like App Academy offer a 3 month training period to people learning to code in exchange for 28% of the graduate's first year compensation once they get a job. Groups providing ISAs are incentivized to do proper due diligence on who they invest in, as well as provide support for the borrower to maximize their chances of success post education. It provides the borrower with downside protection without upside limitations and lower job search costs post graduation.

#### General Return Terms -

The return can be tied to a percent share over a specific amount of time, a specific dollar amount, or a specific amount of time. Altering the terms on each of these manipulates the overall return to The Perennial Fund.

3 Key Return Features<sup>28</sup>:

- 1. Payments tied to net profit.
- 2. A grace period of 3 years to allow farmers to transition.
- 3. A fixed payoff amount:
  - a. Compensates investors for risk
  - b. Incentive for farmers to meet obligation as quickly as possible

This framework is designed to enable a successful capital exit and ties the investors and farmers at the hip further increase the chances of satisfying all parties.

<sup>&</sup>lt;sup>28</sup> <u>https://thegiin.org/assets/Santa%20Clara%20U\_Demand-Dividend-Description.pdf</u>

**Specifically How** - The specifics on how this solution is implemented varies by region, but the guiding high level framework remains the same. The specifics vary with the model because the fixed costs of a farmer changes significantly depending on if they own or rent, their region, their living expenses, and debt. For example in the corn belt average cropland rent is \$204/acre while in the mountain west it's \$90.50/acre. \$100 per acre could allow for the farmer in the mountains to plant a green cover fallow with expenses paid for by EQIP, while in Iowa it would make more sense to plant a perennial alfalfa for transition so they would still have revenue from the alfalfa sale in addition to the \$100 Ioan. Near the end of this paper are several case studies that outline the differences between implementation in three areas with high potential: Iowa, Minnesota, and Nebraska. Below is the general framework for how this investment would function, assuming we've decided on the region of focus.



#### 4-Step Process:

- 1. Discovery
  - a. Market our product at farmer conferences, through large brands, our existing network, farmer forums, and media.
  - b. Interested farmers can fill out a 5 minute survey to quickly find out if they qualify.
- 2. Due Diligence
  - a. Farmers who qualify through the initial online form are then ranked and interviewed for personality fit. Finding farmers hungry for growth, learning, and regenerative agriculture will be prioritized.

- b. A more sophisticated due diligence is then completed with the top tier farmers. This process involves signing an NDA with them and inspecting their full finances—which includes a full review of their assets and liabilities and balance sheets for the past 5 years.
- c. If they pass the 3rd due diligence filter, we offer them the financial product and sign contracts.
- 3. Planning
  - a. Visioning is the first step in the regenerative farm planning process. This critical step will root the design process in the farmers' values and goals to ensure the co-creation phase of farm planning does not stray from the those who will steward the land. Visioning provides a high-level understanding of the cultural foundation of the farm operation. This enables Mad Agriculture to plan how to facilitate the design process and decide what outside subcontractors will be needed.
  - b. The farm plan design is the hub that makes this entire financial model function. The design process includes mapping the property in space and time, soil testing, planting charts, input suggestions, training the farmer, a full financial analysis of the operation, cost savings optimization, access to EQIP funding, and a full transition plan that prioritizes soil health while reducing transition costs. This planning is all done through the lens of enabling the farm to access to premium markets, reducing farm operation costs, and increasing net profits. Access to markets includes sorting out crop logistics, storage, and connections to the buyers. Improving net profits for the farmer includes reducing costs by stacking public funding from EQIP with markets, plus providing recommendations for insurance and operating capital lines that reduce downside risks and increase liquidity. The planning process also gives farmers the opportunity to access additional revenue streams. Mad Agriculture can work will farmers to generate income from unconventional sources, like carbon removal certificates from Nori or alternative transfer mechanisms that monetize improved water use efficiency.
- 4. Implementation with Adaptive Management
  - a. Transition begins and The Perennial Fund pays the farmer \$100/acre/year during the 3 year transition.
  - b. During this time, Mad Agriculture is there 24/7 to support the farmer with any questions they have and ensure their success through our Adaptive Management Framework. The farm plan will be adjusted and iterated based on environmental, market, and human factors.
  - c. After the 3 year transition, the farmer is Certified Organic. Mad Agriculture continues to support the farmer until the farmer's obligation to The Perennial Fund has been repaid. The obligation is that the farmer will pay The Perennial Fund 20% of their net profit for 5 years following transition or other terms that are agreed upon (10% capped IRR, just a time commitment, etc.).

#### **Risks and Hedging**

There are some externally imposed risks to an investment in organic transition. For many of the risks in farming, organic and regenerative management are themselves a strong hedging strategy. We have captured the other notable risks to a transitioning farm, as well as mitigating strategies that minimize losses on exposed investments, in the table below.

#### Moderate Risks / Moderate Loss

Risk	Hedging
Organic market saturation - Increased farmland supply beyond demand	<ul> <li>Unlikely since current demand is 5% vs. supply is 1%</li> <li>Long term offtake agreements</li> </ul>
Organic market volatility reduces expected net profit of farmer	Long term offtake agreement can lock in expected net profits

Farmer defrauds The Perennial Fund when reporting net profits

Conventional lenders may limit operating capital, which would put the squeeze on the working capital capacity of the farm operation

Farmer defaults on the loan due to unforeseen circumstances like crop failure, hospitalization, or their own death

Farmer can not meet payback IRR and Ioan guarantee backs out

Finding farmers to sign up is more difficult than expected and it takes years to disperse capital

Crop insurance won't cover "regenerative" or organic agriculture

Finding impact investors is difficult

U.S. Government tightens budget and lowers EQIP funding, RMA Insurance, and NRCS funding because of \$22T deficit

#### Low Risk / High Loss

Using a piece of accounting software that ensures the farmer is accurately reporting in combination wit	th a
clause in the contract that outlines the legal and financial repercussions if the farmer commits fraud	

- With a growing number of farmers renting land, lenders like <a>FarmOp</a> are providing operation capita byl securing the loan with the crop value or crop insurance vs. traditionally using the land and machinery
- Loan Guarantee Outlined in it's own section below since it can be a critical piece.
  - Rents Land If the farmer is a tenant of the land, the collateral can be tied to the crop or insurance Owns Land - If the farmer owns the land, the collateral can be the crop, insurance, machinery, and/or the land itself
- Extension of Loan If the farmer has not met a minimum of a 10% IRR by year 8, then The Perennial Fund can do a special assessment of the farmer and operation to determine if an extension of the repayment period is appropriate
- Jubilee! Forgive their debt after reviewing finances and concluding its not feasible for them to ever pay it back
- The loan will be fully defaulted on and The Perennial Fund takes the loss
- The Perennial Fund can scale down venture or ramp up partnerships with organizations already enabling farmers
- The Perennial Fund creates an insurance product or we work with an insurance provider to help them create a new product
- Use DAF capital, leverage foundation dollars, or a direct public offering. Alternatives include using NRCS funds, carbon removal certificates, and water ATMs
- This would not inhibit investment, it would decrease the ability to subsidize the cost of regenerative practices and decrease cost savings opportunities
- Organic premiums are still likely to more than cover lost cost savings opportunities

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Risk	Hedging
U.S. Economy business cycle recession, causing decreased organic consumer demand	• During the last financial crisis in 2008, organic demand still increased, but at a slower rate
Trade war between U.S. and international organic buyers.	• The U.S. imports a large portion of our organic crops, with decreased supply it would increase the shelf price of many organic products, driving the price buyers have to pay to U.S. growers up
Moderate portion of investors try to pull invested funds early	Could start litigation war between The Perennial Fund and investors

#### Extremely Low Risk / Extreme Loss

Risk	Hedging

Extreme weather event causes catastrophic national crop failure for 1+ years in a row

Organic prices drop below conventional prices

Trade wars cut off all types of agricultural equipment and input imports

Carbon limitation law makes all gas/diesel powered farm equipment illegal

U.S. Government collapses under \$22T deficit, eliminating all EQIP funding, RMA Insurance, and NRCS funding

- Implementing this program internationally would hedge the risk of a national crop disaster
- Growers could simply sell conventional. If cost savings are kept in check, organic should cost similar to conventional in many areas
- Many regenerative and organic practices can be implemented without the use of special equipment and inputs
  - Electric farmland equipment will be the norm in the near future.
  - People need to eat and whether the food is organic or conventional, it will be purchased

#### Exploring Opportunities for a Loan Guarantee

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A loan guarantee (LG) can provide a win-win-win situation between farmer, investor, and a foundation or the NRCS. A LG, is a pool of capital that provides protection to investors who are seeking a return on their investment, acting as a first loss reserve, while enabling philanthropic or public capital to make 10x the impact it would deliver otherwise.

There are various examples of successfully using a loan guarantee as first loss capital as a catalyst to trigger private capital in <u>US Aid</u>, <u>Healthy Neighborhood Loan Pools</u>, <u>California Freshworks</u>, <u>FlexCap</u>, and many more. This has been successfully used in agriculture by a group called the <u>Carrot Project in Massachusetts</u> to give micro loans to local farmers where their loan guarantees vary from 5% to 100% of the loan value.

This particular model is a unique opportunity to dovetail mission aligned philanthropic or government organizations with private capital due to the immense importance and struggle society is simultaneously grappling in agriculture, food, and climate change. Many other investments struggle to find common ground between expected investor returns and positive social and environmental outcomes. However, this model jumps that divide, allowing all impact oriented parties to work together.

Example - The Perennial Fund identifies 30 farmers who want to transition to organic and have a high likelihood of success. There is still a 5% chance that the IRR The Perennial Fund seeks, will be affected by extreme weather, organic commodity fluctuations, or any other risk that's been addressed above. To effectively hedge this risk, we can use a loan guarantee from the NRCS and/or from a philanthropic foundation to protect The Perennial Funds downside risk, while also accomplishing the mission their capital would otherwise are try to accomplish anyways.

Transitioning the 30 farmers will take \$50,000,000 which can be guaranteed to be returned to The Perennial Fund in a couple of forms. If The Perennial Fund is confident that a 10% top loss coverage will be an effective hedge against specific risk hurdles, then The Perennial Fund would need a \$5,000,000 loan guarantee. This can come in two forms outlined below:

	Low coverage, funded	High coverage, unfunded
ADVANTAGES FOR SCALE	<ul> <li>Minimal risk to guarantors could enable them to provide more guarantees</li> <li>Visible capital and clear access are attractive to recipients</li> </ul>	<ul> <li>High coverage is attractive to most recipients and therefore may bring in significant additional capital</li> <li>Coverage level can decline over time and may eventually be unneeded</li> <li>No up-front liquidity required from guarantor</li> </ul>
DISADVANTAGES FOR SCALE	• Guarantor needs to front the capital, meaning it cannot be used elsewhere	<ul> <li>Higher risk for guarantors</li> <li>Guarantors are constrained in terms of total outstanding liability, potentially limiting their support to a few deals</li> </ul>

The NRCS would likely only operate with a low-coverage funded reserve because they could not take the risk of guaranteeing a certain amount that would put their budget at risk. Foundations and brands could operate in the funded or unfunded space.

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Investors leverage the amount of impact achieved by sources that would otherwise return -100% from the NRCS or philanthropy.

Total NRCS funding (orange) is equal between these two graphics. The dark gray in the top graph is more than the sum of the dark and light gray in the bottom graph because the interest expense paid by farmers is expected to be less than what producers would have paid for their contribution in a traditional NRCS project. The overall amount of conservation achieved is higher in the bottom graphic, with unfunded needs met.<sup>30</sup>

There is also quite a bit of opportunity for a brand to put up a loan guarantee in exchange for the right of first refusal to new organic acreage that is enabled by The Perennial Funds investment and their LG. This would allow a brand to expand their supply without needing all of the upfront capital that would otherwise be necessary and give the farmer and The Perennial Fund more certain market expectations.

As outlined in the GIIN brief there are five key considerations when structuring a loan guarantee<sup>31</sup>:

- 1. Objectives of the guarantee
- 2. Type of risk addressed
- 3. Coverage level
- 4. Financial return
- 5. Triggers and success

Funding for EQIP Conservation Practices -







<sup>&</sup>lt;sup>29</sup> https://thegiin.org/assets/GIIN\_Issue\_Brief\_Guarantees\_final%20for%20web.pdf <sup>30</sup> http://encouragecapital.com/wp-content/uploads/2017/09/EC\_Private-Capital-Re

<sup>&</sup>lt;sup>31</sup> https://thegiin.org/assets/GIIN\_Issue\_Brief\_Guarantees\_final%20for%20web.pdf

These considerations will be addressed more deeply if a loan guarantee is assessed to be an option The Perennial Fund wants to pursue.

In short, the loan guarantee is worth exploring because it provides a unique opportunity for capital that would otherwise experience a -100% loss to lever 10x it's typical impact while derisking investors who want a return.

#### Anticipated Outcomes

We expect this financial tool to unlock massive amounts of potential for farmers who are itching to transition from conventional to organic but do not have the financial means from the current depressed farm economy. It will ultimately mitigate the tail risks singular stakeholders typically face during an organic transition to smooth volatility and create a more stable farm economy. Combining this model with strategically placed field offices, we can realistically impact many more acres than we actually invest in by hosting local workshops and developing place-based networks for learning.

**Financial** - Investment of \$4MM into this program would transition 6,000-10,000 acres of U.S. cropland to transition to organic while netting The Perennial Fund a 9-11% IRR depending on the region and crops of focus. It would be ideal to help more smaller farms but the amount of due diligence and consulting work to enable that work wouldn't allow The Perennial Fund or Mad Agriculture to function as viable businesses. The amount of due diligence and transaction cost does not scale linearly with increasing farm size.

The financial model is conservative for several reasons:

1) We don't take into account possible cost-sharing from the NRCS during the 3 year transition, which would partially fund transition and certification costs.

2) We don't take into the cost-savings on reduced inputs associated with organic staked with regenerative practices and improved soil health.

3) We also don't take into account any potential for value-add above the premium market value of organic commodity. For example, Ardent Mills has robust transitional grains program that pays a transitional premium prior to organic certification. Also, brands like General Mills could pay a higher than market rate premium for organic crops that provide them with a robust supply for a specific product line. The other way to drive value is growing non-commodity specialty organic crops.

**Environmental** - In the corn belt, every acre of conventional land emits 0.405-0.610 MT of CO2 eq per year in the form of gaseous N2O .<sup>32</sup> N2O in agriculture results from fertilizer use, microbial nitrification/denitrification, and mineralization from the soil. A study by the UN Food and Agriculture Organization (FAO) found that organic cropping systems have the double benefit of avoiding emissions from both the application and the energy-intensive manufacturing of synthetic fertilizer.<sup>33</sup> If it is assumed that N2O emissions are minimized by organic management, as it is in the FAO study, then converting 166,000 acres would prevent between 4,046 and 6,100 MT CO2 eq from N2O emissions per year. This would be equivalent to taking 880-1,289 cars off the road.<sup>34</sup> This doesn't account for sequestration, which has the potential to remove 0.18-0.27 MT of atmospheric CO2 per acre per year in traditional organic systems.<sup>35</sup> Combining these organic systems with regenerative practices can drastically improve the CO2 sequestration potential up to 1MT per acre per year.<sup>36</sup> Assuming 0.27MT CO2 per acre sequestered, converting 10,000 acres would achieve a net benefit of 6,746 MT CO2 of emissions avoided or removed from the atmosphere—equivalent to removing 1,454 cars from the road per year.

<sup>&</sup>lt;sup>32</sup> https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

<sup>&</sup>lt;sup>33</sup> https://www.jstor.org/stable/44490580

<sup>&</sup>lt;sup>34</sup>https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

<sup>&</sup>lt;sup>35</sup> https://ofrf.org/sites/ofrf.org/files/staff/Climate\_Guide\_FINAL-F\_WebRes.pdf

<sup>&</sup>lt;sup>36</sup> https://ofrf.org/sites/ofrf.org/files/staff/Climate\_Guide\_FINAL-F\_WebRes.pdf

For every \$100 invested over the three years of transition, as much as 1.0 MT CO2 will be sequestered, 0.4MT of CO2 eq will be avoided through N2O management, and the farmer will be on the road to regenerating his or her land.

Even if it is assumed that eliminating synthetic fertilizer does not totally avoid N2O emissions from farmland, organic and regenerative management still cuts out the enormous impacts of energy use and air pollution embedded in the production of agrochemical inputs. As much as 10% of the total emissions associated with agriculture, or 1% of total anthropogenic emissions, arise from the industrial synthesis of chemical fertilizers.<sup>37</sup> Rigorously-managed organic and regenerative farming systems directly subvert the regime of chemical dependence—and combat environmental degradation at the same time.

**Wider Impact** - The focus of this solution is not purely financial or environmental. Restoration of soil is a leverage point at the center of systemic change that should reverberate through farm enterprises, rural communities, the broader food system, and humanity's influence on the climate. Agriculture drives society.

An investment in organic transition unlocks the potential for developing regenerative agriculture one farm at a time. Adding to farm revenue will increase financial security and improve the quality of life for farmers and their families. In turn, we expect greater community cohesion to spring from the resilience of individual family farms. By repairing the damage done to the soil, we strive also to heal the badly-degraded rural ecosystem.

Further, world leaders have come to recognize the potential of soil management as a means of addressing the climate crisis. Global projects like <u>4 Per 1000</u> have sprung up to institutionalize the international efforts around soil carbon sequestration. In an assessment of reliable sequestration technologies, the National Academies of Sciences, Engineering, and Medicine placed agricultural soil management in the top range of practices that are safe, low-cost, scalable, and immediately deployable.<sup>38</sup> What is needed now, and what Mad Agriculture is equipped to provide, is on-the-ground applications of these promising theories.

# // OTHER SOLUTIONS IN THE MOVEMENT

Farmers are in a perilous time and have a general sense on how to break out of the industrial system to save their livelihoods, but are faced with numerous challenges. Likewise, regenerative agriculture has the potential to remove massive amounts of CO2 from the atmosphere and restore our planet's carbon balance, thwarting climate change. With these two aligned in the context of our current capitalistic society, it is possible for everyone to get what they seek without pushing once invisible externalized costs up or downstream. Recognizing this potential, a number of individuals and organizations have tried to break down barriers and push regenerative agriculture forward.

However, none of them are holding the entire system of change necessary.

#### Current Solutions:

- 1. **Farmland Investment** Groups like Iroquois Valley Farms, Farmland LP, and numerous others are buying organic farmland for management, or buying conventional farmland to transition to organic.
  - a. Pros: Provides an easy way for successful farmers to access more land
  - b. Cons: Scale is limited by capital raised, farm managers don't have as deep of an incentive depending on the model, doesn't help conventional growers

<sup>&</sup>lt;sup>37</sup> http://www.fao.org/3/a-al185e.pdf

<sup>&</sup>lt;sup>38</sup>https://www.nap.edu/catalog/25259/negative-emissions-technologies-and-reliable-sequestration-a-research-ag enda

- 2. **Transitional Premium -** Brands like Kashi are paying farmers a premium for their certified transitional organic crop.
  - a. Pros: Helps generate more revenue during a time of decreased yield, educates consumers
  - b. Cons: Doesn't pay enough, no technical assistance, grains don't provide highest soil health benefits, no upfront capital solution
- 3. Soil Health Bills Some states, such as California, will pay growers to adopt soil health practices.
  - a. Pros: Government dollars to incentivize growers
  - b. Cons: Doesn't solve for upfront capital issue, markets that pay a premium for a farmer practicing regeneratively but not organically are very small and difficult to enter which is unfortunately what many soil health bills incentivize
- 4. **Conferences** Gatherings of all types are happening around the United States aimed at educating investors, farmers, and consumer brands on the benefits of more regenerative agriculture and organic agriculture.
  - a. Pros: Education, networking, humanizes stakeholders
  - b. Cons: Isn't outcome oriented
- 5. **Carbon Farm Planning -** Groups such as the Carbon Cycle Institute create carbon farm plans that are focused on improving ecological outcomes with conservation practices outlined by the NRCS.
  - a. Pros: Plans are very helpful in understanding how to improve ecological state
  - b. Cons: No consideration for premium markets, rely on funding from the government to implement, no enterprise budgets
- 6. **Farmer Training** Programs like Soil Health Academy target farmers and ranchers looking to adopt more regenerative practices on their operation through educational programs focuses on practical implementation.
  - a. Pros: Learn on the ground management from successful professionals
  - b. Cons: Doesn't solve capital, market, infrastructure barriers, no proven outcome if it's actually implemented
- 7. **Pipeline Foods -** Pipeline provides agronomic support, market offtake, and logistics to farmers who are organic or are transitioning to organic.
  - a. Pros: Largest system level thinking to date accounting for many barriers
  - b. Cons: Commodity based, no access to low-cost capital

Bubble size equals \$/acre costs if implemented

# **Comparison of Existing Solutions**



Likelihood of Farmer Success

#### // EVALUATING A THE PERENNIAL FUND IN THREE AG REGIONS

To showcase the data we compiled (using enterprise budgets from various land grant universities) into an <u>investment model</u>, we have selected three regions with strong potential for the launch of a pilot program. All of this data is based on proven historical yields and premiums, not on speculation of any type (ie, growing organic premiums). The regions chosen were lowa, Minnesota, and Nebraska. These areas were selected based on need, potential, existing infrastructure, scale, and familiarity. Though they can all grow similar crops, each region has specific advantages that make it unique, from a low rent to yield ratio to organic infrastructure and farmer culture.

#### Fruitful Rim

- Largest share of large and very large family farms and nonfamily farms
- farms 10% of farms, 22% of produc-tion value, 8% of cropland Fruit, vegetable, nursery, and cotton farms



- Largest share of nonfamily farms, smallest share of US cropland
- 4% of farms, 4% of value of
- production, 4% of cropland Cattle, wheat, and sorghum farms
- **3** Northern Great Plains Largest farms and smallest population
- 5% of farms, 6% of production value, 17% of cropland
- Wheat, cattle, and sheep farms

#### 4 Prairie Gateway

- Second in wheat, oat, barley, rice, and cotton production · 13% of farms, 12% of produc-
- tion value, 17% of cropland
- Cattle, wheat, sorghun cotton, and rice farms
- 5 Heartland Most farms (22%), highest
- value of production (23%), and
- most cropland (27%)
  Cash grain and cattle farms

#### lowa:

Known for its fertility, productivity to grow major commodity crops and high cropland value.

6 Northern Crescent

Most populous region
15% of farms, 15% of value of production, 9% of cropland

Dairy, general crop, and cash grain farms

🔀 Eastern Uplands

Most small farms of any

15% of farms, 5% of produc-

1370 of raffits, 570 of produc-tion value, and 6% of cropland
Part-time cattle, tobacco, and poultry farms

regior

Crops - Corn, soybeans, oats, hay, wheat, rye, red clover

State of Organic - The growth of organic agriculture in Iowa is strong and growing. The state is covered with local organic growers, livestock farms, and organic food processors. Check out the map here. lowa has 732 organic farms on 103,136 acres with continued growth, largely in localized clusters.<sup>39</sup> Of the 30 million acres of farmland in lowa, 47% is owner controlled and 53% is leased. Cash rental agreements comprise more than 80% of all lowa farmland leases.40

X

8 Mississippi Portal

Higher proportions of both small and larger farms than

5% of farms, 4% of value, 5% of cropland Cotton, rice, poultry, and hog farms

elsewhere

5

9 Southern Seaboard

Mix of small and larger farms

· 11% of farms, 9% of produc

Part-time cattle, general field crop, and poultry farms

With local leaders throughout the state, it's easier to cluster or spatially distribute the farms we prioritize, depending on how we want to spread risks. Clustering farms allows us to hire on the ground professionals who intimately know the climate, soils, weeds, and pests of the region. While working with spatially distributed farms reduces the chance of a weather event (drought, hail, flood, heat) damaging a significant portion of the farms we work with.

The ideal methodology would most likely be a combination of these two options—using spatially separated clusters of farms in uncorrelated weather paths. This would allow us to hire actual practitioners of organic cropping systems (not riskless agronomists, selling snake oil) in prime focal points capable of reducing overall transition friction to champion this model and help other farmers. Clustering farms also reduces the costs associated with transporting and processing crops post production. The total fund size and return profile will determine the maximum amount of acreage per cluster based on risks versus expected return.

Groups Leading the Charge -

Iowa Organic

<sup>&</sup>lt;sup>39</sup>https://www.desmoinesregister.com/story/money/agriculture/2017/11/03/looking-greater-profits-more-iowa-farmers-move-organic-corn-soybeans/821234001/ rticle/7-fast-facts-about-iowa-farmland/

- Rodale Midwest Organic Center
- lowa State

Areas of Focus - Each with a cluster of organic growers, near a dairy, and processing facility. Can be seen on the above map.

- Kalona, IA
- Fairbank, IA outside of Waterloo
- Des Moines, IA
- Bloomfield, IA

#### Methods of Transition -

Average yearly cash rent in lowa for 2018 was \$222 and yearly taxes/insurance for landowners was \$111.<sup>41</sup> Loaning \$100 per acre would not work for those who rent nor those who own their land if that was the farmer's only revenue. \$100 would not cover their fixed costs during transition. In order to effectively transition to organic to cover costs the farmer will have to grow a crop throughout the three year transition. The transitional crop will likely not generate a net profit, but the \$100 per acre loan makes up the gap to cover the farmer's remaining fixed costs and living expenses.

#### Proven Transition:42 43 44 45

Year 1 - Corn/hemp, early summer transition begins, corn harvest, fall oat cover crop mix (peas, vetch, clover)

- Year 2 Alfalfa (intensively contract grazed, sold at dairy, or combination)
- Year 3 Alfalfa (intensively contract grazed, sold at dairy, or combination)
- Year 4 Organic Corn or Wheat, fall cover cocktail

Post Transition - Soybean/Legume (fall-cover cocktail), oat-alfalfa, alfalfa, corn (fall cover cocktail)



# This transition is effective for its use of timing, low cost of production, and marketability of transition crops. Organic transition can begin at the last use of prohibited substances, whether that be January at the start of the calendar year or mid-season after a crop has been planted and sprayed down with herbicides/pesticides. Shifting the beginning of the transition to mid-season allows for fertilizers and herbicides/pesticides to be applied to a non-gmo crop. That way, the farmer can attain a similar yield to previous years while 3-4 months into the organic certification. This ideally sets up the farm to be certified organic mid-season in year 4.

- <sup>42</sup> http://extension.agron.iastate.edu/organicag/
- <sup>43</sup> https://practicalfarmers.org/2017/07/field-day-recap-transitioning-to-organic-crop-farming/ 44
- <sup>44</sup> https://landstewardshipproject.org/farmtransitionsvaluingsustainablepracticesorganicprofits
  <sup>45</sup> https://www.agriculture.com/news/crops/what-farmers-need-to-know-about-growing-hemp

<sup>&</sup>lt;sup>41</sup> https://www.extension.iastate.edu/agdm/wholefarm/html/c2-10.html



With a growing hemp industry, large amounts of farmland will be growing the crop within the next couple of years. We believe this is a bubble that will eventually pop from supply being able to meet demand. 2020 will be a year where the industry is still growing, and supply can't meet demand, making it a perfect transition crop in the right regions.

Modeling -

Using the model, we calculated the following returns for an operation transitioning to organic.

- Transition: corn alfalfa alfalfa
- Organic 4 Year Rotation: corn soybean alfalfa alfalfa

Perennial Fund: IRR over Loan Term				Farmer: Increase ROI over Loan Term (compared to average 5 years)				Farmer: Increase ROI over Loan Term (compared to average 10 years)			
	10.00%	20.00%	30.00%		90.00%	80.00%	70.00%		90.00%	80.00%	70.00%
5 Year Loan	-37%	-16%	-1%	5 Year Loan	136.28%	115.40%	94.53%	5 Year Loan	2.84%	-6.24%	-15.33%
6 Year Loan	-21%	-1%	14%	6 Year Loan	175.17%	149.08%	122.99%	6 Year Loan	19.77%	8.42%	-2.94%
7 Year Loan	-11%	8%	21%	7 Year Loan	202.95%	173.13%	143.31%	7 Year Loan	31.87%	18.89%	5.91%
8 Year Loan	-5%	13%	26%	8 Year Loan	223.78%	191.17%	158.56%	8 Year Loan	40.93%	26.74%	12.54%
9 Year Loan	-1%	17%	29%	9 Year Loan	239.99%	205.20%	170.41%	9 Year Loan	47.99%	32.85%	17.70%
10 Year Loan	3%	19%	31%	10 Year Loan	252.95%	216.43%	179.90%	10 Year Loan	53.63%	37.73%	21.83%

The calculated IRRs are based on average numbers from enterprise budgets. The percentage at the top represent the share of the net profits The Perennial Fund would receive and the percentage the farmer would receive. The left column with different length loans includes the 3 year transition period. All IRRs are calculated using an organic yield decrease of 19.2% when compared to conventional regional yields.<sup>46</sup> The IRRs in bold are equitable for the farmer and acceptable as reasonable returns for The Perennial Fund, with a bottom line of 5% and a cap of 20%. These calculations also use \$10/bu corn, \$20/bu soybean, and \$250/ton alfalfa. To be conservative, we did not add organic premium growth.

The model outputs various IRRs. Based on previous conversations, the term and return that aligns with investor goals without being extractive is an 8 year note with a 20% net revenue share for 5 of those years after transition to organic. This would return The Perennial Fund a 13% IRR over 8 years (including the 3 year transition) and return the farmer an average of 191.2% more net profit and 26.7% more net profit when compared to the average of the previous 5 and 10 years net revenue respectively. The enormous difference between the 5 year and 10 year net revenue percent change is from the booming 2011-2014 commodity prices and bottomed out prices of the last 5 years.

We know that incorporating regenerative practices with organic management could decrease this yield gap. This model also does not have the cost savings of regenerative practices built in which could improve the net margin further, specifically from less yield variance in relation to weather events over time. By using EQIP funding, we would be able to cost share cover crop costs and organic certification. The transition also does not include a transitional/non-gmo premium, which is another entirely possible opportunity.

<sup>&</sup>lt;sup>46</sup> <u>https://royalsocietypublishing.org/doi/full/10.1098/rspb.2014.1396</u>

Iowa: Net Profit of Farmer and PF (\$100/acre/yr and 20% net revenue share for 5 years)



lowa - [Transition: corn - alfalfa - alfalfa] [Organic 4 Year Rotation: corn - soybean - alfalfa - alfalfa]

#### Minnesota:

Known for its diverse climate ranging from its own corn and dairy belt, middle of the road rent, and progressive organic movement.

Crops - Corn, soybeans, hay, sugarbeets, hogs, dairy<sup>47</sup>

State of Organic - In Minnesota there are 731 certified organic operations on 210,752 acres. <sup>48 49</sup> There is massive state level support with various universities, non-profits, and for-profits all working to transition more acres to organic. With robust networks of trusts, this state would be a great way to quickly build lists of potential farmers and find market offtake.

Groups Leading the Charge -

- Pipeline Foods
- <u>University of Minnesota</u>
  - <u>UMN Organic Risk Management Document</u>
- Department of Agriculture cropland grazing exchange
- <u>Minnesota State</u>
  - <u>Directory of Organic Farmers</u>
- Sustainable Farming Association
- MOSES Midwestern Organic and Sustainable Education Services

Areas of Focus - Minnesota is at an ideal apex point between these two to reduce transportation costs. The below counties are areas where maximum alfalfa and corn yields can be found, close to other organic growers, and are in close to dairy farms, who will purchase the crops.<sup>50 51</sup>

- Big Stones County
- Stevens County

<sup>&</sup>lt;sup>47</sup> https://www.nass.usda.gov/Statistics by State/Minnesota/Publications/Crops Press Releases/2018/MN Crop Production Annual 01 18.pdf

https://organic.ams.usda.gov/Integrity/Reports/OperationAcreageReport.aspx
 https://www.agweek.com/business/agriculture/4520001-report-us-organic-acres-rise

<sup>&</sup>lt;sup>50</sup> https://www.nass.usda.gov/Statistics\_by\_State/Minnesota/Publications/County\_Estimates/2019/MN-CtyEst-Corn-17-18.pdf

<sup>&</sup>lt;sup>51</sup> https://www.nass.usda.gov/Statistics\_by\_State/Minnesota/Publications/County\_Estimates/2019/MN-CtvEst-Hay-17-18.pdf

#### Swift County



#### Methods of Transition -

Average yearly cash rent in Minnesota for 2017 was \$166 and yearly taxes/insurance for landowners was \$83.<sup>54</sup> Loaning \$100 per acre would not work for those who rent their land if that was the farmers only revenue. \$100 would not cover their fixed costs during transition. In order to effectively transition to organic to cover costs a renting farmer will have to grow a cash crop throughout the three year transition. The transitional crop will likely not generate a net profit, and the \$100 makes up the gap to cover the farmers remaining fixed costs and living expenses.

For farmers who own their land outright or farmers whose ownership costs plus debt on the land is below \$100 per acre, there is an opportunity to stack NRCS cost sharing from EQIP and FSA assistance to pay for cover crop seeds to use a green fallow for the transition. This option is ideal because it allows the farmer to maximize soil health during the transition years, preparing the soil to thrive without the chemicals it was previous dependent on. It is highly contingent on the farmer's financial situation to assess if \$100 per acre will cover all of their fixed costs and living expenses during the transition.

Proven Transition -

- Year 1 Corn/hemp, early summer transition begins, corn harvest, fall oat cover crop mix (peas, vetch, clover)
- Year 2 Alfalfa (intensively contract grazed, sold at dairy, or combination)
- Year 3 Alfalfa (intensively contract grazed, sold at dairy, or combination)
- Year 4 Organic Corn or Wheat, fall cover cocktail
- Post Transition Soybean (fall-cover cocktail), oat-alfalfa, alfalfa, corn (fall cover cocktail)

Ideal Transition -

- Year 1 Corn/hemp, early summer transition begins, corn harvest, fall oat cover crop mix (peas, vetch, clover)
- Year 2 Alfalfa with Cover Crop Cocktail (intensively grazed or mowed in)
- Year 3 Alfalfa with Cover Crop Cocktail (intensively grazed or mowed in)
- Year 4 Organic Corn or Wheat, fall cover cocktail
- Post Transition Soybean (fall-cover cocktail), oat-alfalfa, alfalfa, corn (fall cover cocktail)

<sup>&</sup>lt;sup>52</sup> http://www.geocurrents.info/wp-content/uploads/2012/11/Corn-belt-Dairy-Belt-maps.png

<sup>&</sup>lt;sup>35</sup> https://extension.umn.edu/sites/extension.umn.edu/files/styles/caption\_medium/public/forage-production-2014.jpg?itok=7-r6YvXN
<sup>54</sup> https://www.nass.usda.gov/Statistics\_by\_State/Minnesota/Publications/County\_Estimates/2017/MN\_County\_Cash\_Rent\_09\_2017.pdf

#### Modeling -

Using the above model, we calculated the following returns for an operation transitioning to organic.

- Transition: corn alfalfa alfalfa
- Organic 4 Year Rotation: corn soybean alfalfa alfalfa

	Perennial Fund: IRR over Loan Term				Farmer: Increase ROI over Loan Term (compared to average 5 years)				Farmer: Increase ROI over Loan Term (compared to average 10 years)			
	10.00%	20.00%	30.00%		90.00%	80.00%	70.00%		90.00%	80.00%	70.00%	
5 Year Loan	-43%	-23%	-10%	5 Year Loan	339.53%	300.27%	261.02%	5 Year Loan	29.68%	18.09%	6.51%	
6 Year Loan	-27%	-8%	5%	6 Year Loan	413.48%	364.41%	315.34%	6 Year Loan	51.49%	37.02%	22.54%	
7 Year Loan	-17%	1%	14%	7 Year Loan	466.30%	410.23%	354.15%	7 Year Loan	67.08%	50.53%	33.99%	
8 Year Loan	-10%	7%	19%	8 Year Loan	505.92%	444.58%	383.25%	8 Year Loan	78.77%	60.67%	42.58%	
9 Year Loan	-5%	11%	22%	9 Year Loan	536.73%	471.31%	405.88%	9 Year Loan	87.86%	68.56%	49.25%	
10 Year Loan	-2%	13%	24%	10 Year Loan	561.38%	492.69%	423.99%	10 Year Loan	95.13%	74.86%	54.60%	

The model outputs various IRRs depending on the length of loan and percentage of net income sharing. Based on previous conversations the term and return that aligns with investor goals without being extractive is an 8 year note with a 20% net revenue share for 5 of those years after transition to organic. This would return The Perennial Fund a 7% IRR over 8 years (including the 3 year transition) and return the farmer an average of 444.6% more net profit and 60.7% more net profit when compared to the average of the previous 5 and 10 years net revenue respectively. The enormous difference between the 5 year and 10 year net revenue percent change is from the booming 2011-2014 commodity prices and bottomed out prices of the last 5 years.



Transition: corn - alfalfa - alfalfa Organic 4 Year Rotation: corn - soybean - alfalfa - alfalfa

#### <u>Nebraska:</u>

In the Northern High Plains, Nebraska is drier than Minnesota and Iowa, lending it well to dry beans, wheat, hay, sugar beets, and when irrigation is present, high yield corn and soybeans.

Crops - corn, dry beans, hay, soybeans, wheat, sugar beets

State of Organic - In 2017, Nebraska has 162 organic farms with a total acreage of 107,371 selling \$96 million of organic products in 2016.<sup>55</sup> This represents a 33% growth in sales over the previous year.<sup>56</sup> Nebraska farms are working hard to transition to organic despite the general lack of support compared to other states. The state has faced a couple of challenges within the last year. A continuing \$142MM organic fraud case has likely made local farmers and buyers skeptical of the legitimacy of crops labeled organic. <sup>57</sup> In early 2019, devastating floods destroyed highways, homes, stored crops, and livestock causing more than \$1.3 Bn in damages.<sup>58</sup> With the timing of the floods coming March, many farmers will not be able to get a crop in the ground before the water recedes, leading to a year of lost income. The future of organic in Nebraska has the potential to be strong, as conventional farmers desperately seek a way to continue practicing their livelihood.

Groups Leading the Charge -

- University of Nebraska
  - o <u>More from UN</u>
- <u>Midwestern Bio Ag</u>
- <u>Agrisecure</u>
- Grain Place Foods
- <u>Common Good Farm</u>
- Eric Thalken

#### Areas of Focus -

Using this <u>mapping tool</u> to find clusters of organic growers, combined with maps of counties with the highest corn production and alfalfa production, the following areas would be best suited for a pilot project<sup>59</sup>:

- Washington County
- Thurston County
- Butler County

#### Methods of Transition -

In 2018, the average cash rent for dryland cropland in Nebraska was \$106 per acre. In the same year, the average cash rent for irrigated cropland was \$212 per acre.<sup>60</sup> The cost of insurance and taxes to landowners for dryland and irrigated land in 2018 was \$53 and \$106 per acre, respectively. A loan of \$100 per acre would likely be insufficient to cover the cost of operations and living expenses for farmers that rent their land. Farmers that rent their land would need to grow supplemental crops to make up the difference during the transition period.

For dryland farmers that own their land outright, a \$100 per acre loan may be sufficient to cover fixed costs and living expenses. This could allow these farmers to utilize EQIP financial assistance to transition with a cover crop and green fallow system that maximizes soil health. Since the financial situation of farm enterprises vary on a case-by-case basis, it will be necessary to assess whether individual owner-operators could support themselves using only the three year transition payments.

Transitioning to an organic system in Nebraska has typically been accomplished with carefully planned crop rotations. Rotations allow farmers to address weeds and pests while also managing soil nutrients without prohibited chemical inputs. Manure or minor soil amendments, like soluble phosphorus, can supplement the nutrient cycling that is accomplished with rotating crops that alternately fix and remove nitrogen. In any crop rotation system there are a number of planning factors that influence the success of the farm during and after the

<sup>&</sup>lt;sup>55</sup> https://www.cfra.org/sites/www.cfra.org/files/publications/OrganicAgricultureNebraska10-2018.pdf

<sup>&</sup>lt;sup>56</sup> https://cropwatch.unl.edu/2017/nebraska-organic-production-33-previous-year

<sup>&</sup>lt;sup>56</sup> <u>https://www.world-grain.com/articles/12053-organic-grain-fraud-case-continues-with-fifth-guilty-plea</u> <sup>58</sup> https://www.ppr.org/2019/03/21/205408364/nebraska-faces-over-1-3-billion-in-flood-losses

<sup>&</sup>lt;sup>59</sup> https://cropwatch.unl.edu/how-2013-corn-and-soybean-yields-stack-against-previous-yields

<sup>60</sup> https://agecon.unl.edu/research/2018-nebraska-farm-real-estate.pdf

transition period. These include: 1) use of a nitrogen fixing cover crop during and after transition, 2) combating annual weed pressures by alternating two successive years of cool season crops with two successive seasons of warm season crops, 3) combating perennial weed pressure by planting several years of mowed or grazed perennial forage, and 4) building soil structure and root biomass by alternating diverse shallow and deep rooting crops. For areas of Nebraska with adequate rainfall, a rotation between perennial legumes and a corn-soybean sequence, followed by winter wheat is recommended.<sup>61</sup>

Proven Transition62 -

Year 1 - Corn/hemp, early summer transition begins, corn harvest, fall oat cover crop mix (peas, vetch, clover)

Year 2 - Alfalfa (intensively contract grazed, sold at dairy, or combination)

Year 3 - Alfalfa (intensively contract grazed, sold at dairy, or combination)

Year 4 - Organic Corn or Wheat, fall cover cocktail

Post Transition - Soybean (fall-cover cocktail), oat-alfalfa, alfalfa, corn (fall cover cocktail)

Ideal Transition -

Year 1 - Corn/hemp, early summer transition begins, corn harvest, fall oat cover crop mix (peas, vetch, clover)

Year 2 - Alfalfa (intensively grazed or mowed)

Year 3 - Alfalfa (intensively grazed or mowed)

Year 4 - Organic Corn or Wheat, fall cover cocktail

Post Transition - Soybean (fall-cover cocktail), oat-alfalfa, alfalfa, corn (fall cover cocktail)

Modeling -

Using the model, we calculated the following returns for an operation transitioning to organic.

- Transition: corn alfalfa alfalfa
- Organic 4 Year Rotation: corn soybean alfalfa alfalfa

	Perennial Fund: IRR over Loan Term				Farmer: Increase ROI over Loan Term (compared to average 5 years)				Farmer: Increase ROI over Loan Term (compared to average 10 years)			
	10.00%	20.00%	30.00%		90.00%	80.00%		70.00%		90.00%	80.00%	70.00%
5 Year Loan	-39%	-18%	-3%	5 Year Loan	-%	-%	-%		5 Year Loan	544.30%	499.80%	455.30%
6 Year Loan	-23%	-2%	12%	6 Year Loan	-%	-%	-%		6 Year Loan	603.81%	548.18%	492.55%
7 Year Loan	-13%	6%	20%	7 Year Loan	-%	-%	-%		7 Year Loan	646.32%	582.74%	519.16%
8 Year Loan	-6%	12%	24%	8 Year Loan	-%	-%	-%		8 Year Loan	678.20%	608.66%	539.12%
9 Year Loan	-2%	15%	27%	9 Year Loan	-%	-%	-%		9 Year Loan	702.99%	628.82%	554.64%
10 Year Loan	2%	18%	29%	10 Year Loan	-%	-%	-%		10 Year Loan	722.83%	644.94%	567.06%

The model outputs various IRRs depending on the length of loan and percentage of net income sharing. Based on previous conversations the term and return that aligns with investor goals without being extractive is an 8 year note with a 20% net revenue share for 5 of those years after transition to organic. Using \$10/bu corn, \$20/bu soybean, and \$250/ton alfalfa returns The Perennial Fund a 12% IRR over 8 years (including the 3 year transition) and return the farmer an average of 608.7% more net profit when compared to the average of the previous 10 years net revenue respectively. The percent change using the average of the past 5 years is incalculable since the average net profit of farmers from 2014 to 2018 was -\$0.38 net profit per acre.

<sup>&</sup>lt;sup>61</sup> http://extensionpublications.unl.edu/assets/pdf/g2282.pdf

<sup>&</sup>lt;sup>62</sup> http://extensionpublications.unl.edu/assets/pdf/g2282.pdf



Nebraska: Net Profit of Farmer and PF (\$100/acre/yr and 20% net revenue share for 5 years)

Transition: corn - alfalfa - alfalfa Organic 4 Year Rotation: corn - soybean - alfalfa - alfalfa

# // PILOT PROJECT COMPARISON

	low	/a	Minne	esota	Nebra	aska	
8 Year IRR	139	%	79	%	12%		
Cash Rent	\$22	22	\$10	66	\$106 / \$212 irrigated		
Costs to Own	\$11	.1	\$8	3	\$53/\$106	irrigated	
Net for Farmer during Transition before Flat Fee	-\$24	.44	-\$42	2.87	\$69.84		
Net for Farmer during Transition with Flat Fee	\$75.	56	\$57	.13	\$169.84		
Net Gained for The Perennial Fund: in addition to \$300 payback	The \$188.56 d: in payback			.10	\$165.13		
Net Gained for Farmer: 8 Year Note	\$2,18	0.93	\$1,731.78		\$2,370.04		
	Rent	Own	Rent	Own	Rent	Own	
The Perennial Fund Return/Risk	1.65	1.65	0.79	0.79	1.45	1.45	

Farmer Return/Risk	8.61	17.22	9.15	18.29	19.6	39.20
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Calculations:

The Perennial Funds Risk (Impact) = 3 years x \$100 = \$300Farmers Risk (Impact) = 3 years x rent or costs of ownership = \$X Exposure = probability x ( impact of investment or fixed costs x 3 years) The Perennial Fund Ratios = reward / risk = \$188.56 / \$114.075 = 1.65 Farmer Ratios = reward / risk = \$2180.93 / \$253.25 = 8.61

The Perennial Fund Risk	Probability	Impact	Exposure
Loan Delinquency	0.02 <sup>63</sup>	\$300	\$6
Bankruptcy	0.0002564	\$300	\$0.075
Farmer Death	0.01	\$300	\$3
Crop Failure	0.10	\$300	\$30
Organic Premium 50% Loss	0.20	\$300	\$60
Other	0.05	\$300	\$15
		Total Exposure	\$114.075

To be extremely conservative, we calculated the exposure using the maximum risk The Perennial Fund will make, \$300 over three years. Using \$300 as the amount at risk is not realistic because The Perennial Fund would likely have some type of collateral (crop, farm, equipment, insurance). When in reality if a loan guarantee is made, none of the capital is at risk below the exposure and certain risks like loan delinquency could simply mean a late payment, not total loss.

		lowa		Minnesota		Nebraska	
Farmer Risk (Rental)	Probability	Impact	Exposure	Impact	Exposure	Impact	Exposure
Loan Delinquency	0.0265	\$666	\$ 13.32	\$498	\$9.96	\$318	\$6.36
Bankruptcy	0.0002566	\$666	\$0.1665	\$498	\$0.1245	\$318	\$0.0795
Farmer Death	0.01	\$666	\$6.66	\$498	\$4.98	\$318	\$3.18
Crop Failure	0.10	\$666	\$66.6	\$498	\$49.8	\$318	\$31.8
Organic Premium 50% Loss	0.20	\$666	\$133.2	\$498	\$99.6	\$318	\$63.6
Other	0.05	\$666	\$33.3	\$498	\$24.9	\$318	\$15.9
	Total Exposure		\$253.25		\$189.36		\$120.92

We used non-irrigated land in Nebraska to more closely simulate what the land wants to be instead of using man made structures to force our will upon it.

		lowa		Minnesota		Nebraska	
Farmer Risk (Own)	Probability	Impact	Exposure	Impact	Exposure	Impact	Exposure
Loan Delinquency	0.0267	\$333	\$6.66	\$249	4.98	\$159	\$3.18
Bankruptcy	0.0002568	\$333	\$0.083	\$249	.06225	\$159	\$0.03975
Farmer Death	0.01	\$333	\$3.33	\$249	2.49	\$159	\$1.59
Crop Failure	0.10	\$333	\$33.33	\$249	24.90	\$159	\$15.9
Organic Premium 50% Loss	0.20	\$333	66.6	\$249	49.8	\$159	\$31.8
Other	0.05	\$333	16.65	\$249	12.45	\$159	\$7.95
	Total Exposure		\$126.63		\$94.68		\$60.46

We used non-irrigated land in Nebraska to more closely simulate what the land wants to be instead of using man made structures to force our will upon it.

- <sup>63</sup> https://fred.stlouisfed.org/series/DRFAPGACBN
- <sup>64</sup> https://www.fb.org/market-intel/farm-bankruptcies-in-2018-the-truth-is-out-there
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<sup>&</sup>lt;sup>66</sup> https://www.fb.org/market-intel/farm-bankruptcies-in-2018-the-truth-is-out-there <sup>67</sup> https://fred.stlouisfed.org/series/DRFAPGACBN

This chart is a basic way of comparing the multiple variations of return versus risk in Iowa, Minnesota, and Nebraska. At first glance, it seems that Iowa would be the best investment, Nebraska in the middle, and Minnesota, the worst, when looking strictly at the IRR. This would be the case if the model played out exactly as intended, which will not happen. It is unlikely that any model with multiple factors predicts actual future events, whether it's weather, bond market performance, political candidate selection, or future population of fish species. There are too many factors to predict the future. Models can however give reasonable best guesses based on past events and future expectations.

We can minimize our exposure to unexpected events by maximizing our exposure to the amount of high probability events. If you look at the Return/Risk Ratios above, you can compare regional risks based on expected net incomes and probability of detrimental events to the farmer and The Perennial Fund. In essence, The Perennial Fund is risking \$300 per acre, yet it is highly likely that only a portion of it will be lost in the case of a farmer death, hail storm, decreasing market premium, or other factor. With a diverse portfolio of farmers, the probability of "random" events will create a normal distribution where it is expected that 10% of farms will experience crop failure on a given year.

The above model outputs that John (a fictional farmer), the average conventional lowan going to organic, will net \$2,180.93 on an 8 year note. This is under the expectation that his alfalfa crop will grow at a 30% and then 19% yield penalty from the transition to organic. If John's crop is hit with a 2-inch hail storm, suddenly he is responsible for a \$222 land rent payment per acre with no revenue in addition to The Perennial Fund's \$100 per acre. John is now \$112 in the red for that year and will have to recoup those losses over the next couple of years. The Perennial Fund will have to take the IRR hit or wait a longer term for John to pay back the note as he climbs out of debt to his operating loan lender.

If The Perennial Fund instead invested into Rick's farm in Nebraska, and that same hail storm came through, they would have to recoup less than half of that cost since rent is only \$106 per acre. Rick would only have to recoup an additional \$6, putting him in a much better position to pay back his operating loan and The Perennial Fund. Working within an area with a lower rental rate reduces the farmers financial hardship while giving The Perennial Fund access to nearly the same upside, 12% IRR in Nebraska versus 13% in Iowa.

With a portfolio of farmers spread across an area, the volatility of the fund's IRR will be smoothed and likelihood of the overall fund suffering is lowered as low probability events have less effect. All of this is without consideration for loan guarantee. A loan guarantee could be put up by three different groups to spread The Perennial Fund and Mad Ag's impact.

In this model, Minnesota scored the lowest in terms of return/risk ratios and IRR. The choice is between lowa and Nebraska. Iowa has the highest IRR potential from its high yields, but it also has a very high rent. Nebraska has moderate yields and rent at half of the cost. It's estimated that Iowa will have 13% IRR and Nebraska a 12% IRR. When it comes to raw potential Iowa would be the clear bet, but when risk exposure is factored in, the comparison shifts.

For every dollar The Perennial Fund risks in Iowa it expects to return 1.65 for The Perennial Fund and 8.61 for the farmer. For every dollar The Perennial Fund risks in Nebraska, it expects to return 1.45 for The Perennial Fund and 19.6 for the farmer. This difference comes from the fact that farmers paying a much higher rent are putting more on the line during a transition in Iowa. Iowan farmers have more at risk per acre. The key piece is that the higher the farmers upside is, the higher The Perennial Funds chance of success is because this model functions from a net basis, not gross.

# // HOW TO TEST PILOT PROJECT

Two methodologies will be central to fully vetting and developing this pilot program before and during launch.

- 1. User Centered Design
- 2. Lean Startup Methodology



If a business fails to meet the expectations of investors or founders (beyond timing and the right team), It is because the product or service was created without design thinking. Design thinking ensures that you have done enough customer research through observation, conversations, and experimenting to KNOW exactly what product your customer needs. When you develop a product that legitimately improves their life, the process of sales becomes clear because you simply have to connect with who it is made for. When someone's hopes, dreams, desires, fears, and motivations are fully understood, it is much easier to create a product or service that is tailored made for them. And tailor-made to sell.

Mad Ag has done this research. We know farmers. We know why farmers are struggling within all the nuances of modern agriculture. We've formed insight, tested various opportunities, met with all of the groups leading the charge into regenerative agriculture, and we have generated a wide-ranging spectrum of solution-oriented ideas.

To date, this model is the most comprehensive and scalable solution capable of delivering massive change we have come across. We cover our other ideas in their own section towards the bottom. To test this pilot project, we will create a minimum viable product (MVP) to gauge real farmer interest. The best example of how we'll approach this is similar to how <u>Dropbox tested their leap of faith assumption</u>. In short, they weren't sure people wanted file synchronization software so they built a 3 minute video, put it online with a register now box, and got 100,000 sign-ups on the first night it launched. They didn't even have a product built.

We can create a webpage that simply describes the program, a small 3-5 question survey to gauge demographics and re-target, and launch an MVP. it will be presented in a way that makes the farmers who fill out the survey think the program is live and running. The MVP will be as close to the real product on the front end as it would be if the fund was up and running.

Through our own networks we'll be able to push the program to hundreds of farmers, specifically through various list serves. Based on the survey results, we can judge farmer interest. One hiccup we'll have to work around is contacted the large portion of farmers who do not have email and are hard to reach. Those farmers may very well not be within our target customer segment, since it is likely farmers who have a growth mindset are online.

There is great research that can be a helpful guide to understanding farmer motivations and obstacles. For example in one study<sup>69</sup>:

- Over 80% of all respondents identified the cost of certification as an obstacle to transition, with more than 43% identifying this as a major obstacle.
- More than 63% of all respondents identified availability of organic processing facilities as an obstacle to transition, with more than 38% identifying it as a major obstacle.
- The best form of support is mentoring from experienced organic farmers and one-on-one technical assistance during the transition.

Studies like this will help frame how we initially market and frame the product/service. We will combine this information with feedback from farmers and industry professionals we are close with, as well as Mad Ag's internal expertise. Using the lean startup methodology of build, measure, learn, we will be able to quickly adapt to best suit farmers' needs.

If the MVP is a success, we can then start calling our list of interested farmers to learn more through empathy interviews. What intrigued them, what are they concerned about, what are their motives, their timeline? We can improve the value proposition by listening to real alpha participants and taking their thoughts seriously.

Design thinking will help us discover exactly who our core customer segment is, how to market and sell to them, and where they are located. The interesting piece about this strategy is that we can have a list of hundreds of potential farmers before any money is raised.

The next step would be to select high potential farmers in our chosen state (likely Nebraska or Iowa). We will reach out and candidly express where we are on the journey, and if they want access to this unique opportunity, they will have to share a deep history of their farm finances with us. This will allow us to build real proformas and select only the highest potential farmers, for the pilot.

Once the money is raised and we have identified the right alpha project farmers, the pilot will be ready for launch.

# // DUE DILIGENCE

In order to ensure the success of the pilot program and long-term health of the transitioned farmland, we will employ a thorough due diligence process to assess each potential partner farm. Screening begins with the application process. By completing a short application, farmers demonstrate that they are interested in the program and willing to invest some of their time to learn more. Following the application, we will interview farmers that potentially match the needs of the program and possess the necessary qualities. If the interviews reveal a mutual

<sup>&</sup>lt;sup>69</sup> https://tilth.org/app/uploads/2017/03/OT\_OSU\_TransitionReport\_03212017.pdf

fit (based on our design thinking process), we will conduct a thorough screening process to determine the likelihood of a successful partnership. The selection process will consider the following criteria.

- What is the state of the farm's finances? We will need access to 5 years of the following information:
  - Assets
  - Liabilities
  - Balance sheets
- Does the farmer own or lease land? If land is owned, what is the farmer's debt obligation? If land is leased, what is the length of the lease, the terms of the lease, and rent payment?
- Does the farmer have access to an existing line of operational credit? If so, is the credit in good standing and is it likely to be maintained through the organic transition?
- Does the farmer have existing crop, revenue, or whole enterprise insurance? If so, would they be able to maintain the policy or renegotiate for increased protections to organic premiums?
- Does the farmer have a record of implementing conservation practices? If so, how have the practices performed?
- What is the size of the farm? Small farms (less than 500 acres) will only be accepted on a limited basis, due to the level of administrative effort required for each partner.
- Will the farmer need access to a significant labor pool? If so, can the farmer count on that labor?
- Is the farm adjacent to other conventional farms where chemical drift or overspray might nullify organic certification?
- Is the farm located in an area prone to extreme weather that might result in crop failure? If so, does the farmer have an existing mitigation strategy?
- Is the farm near organic processing, transportation, or other infrastructure?
- Is the farm located in an area where other organic farms are thriving? If so, what is the farmers relationship with the organic community?
- Is the farmer personally prepared for the difficulties of transition?
- Does the farmer value aspects of the farm equal to (or above) financial performance (e.g. place in the community, ecological benefit, cultural legacy, etc.)?

Not fitting the ideal situation for one or a few of the above criteria won't necessarily disqualify a farmer from the program. Strengths in certain aspects can outweigh weaknesses in others. For example, it may be worth overlooking high debt repayment costs if a farmer has plenty of collateral and a high level of motivation to complete the transition. However, facing too many financial, interpersonal, or logistical barriers would compel us to halt the screening process with a farmer. The goal of this assessment process is to get a holistic picture of a farmer's personal resilience, financial wherewithal, and overall likelihood of success.

# //TARGET CUSTOMER

The target farmer for the pilot program will represent a somewhat atypical case. This farmer will be naturally equipped to overcome many of the barriers that prevent others from transitioning to organic. He or she will probably be thinking about making the switch already. Armed with transition capital, support, and risk management, this farmer will embrace both the financial and ideological gains generated by a regenerative revolution. We will identify our potential customer against the following criteria.

#### <u>General</u>

#### • Conventional Commodity Farmer

- Necessary experience: corn, soybeans
- Additionally Helpful: oats, alfalfa, wheat, dry beans, milo, lentils, cover crops, others

- Location Colorado, Nebraska, South Dakota, Southern Minnesota, Iowa, Northern Kansas
- Farm Size 500+ acres
- Land Long term lease (8+ years) or own
- Age Less than 65 years old
- Health must be in a normal healthy range
- Access Minimizing distance from the farm to organic processing or storage is critical.

#### Farm Management

- **Practices** Has used various conservation practices such as no-till, cover cropping, compost application, livestock integration, perennial plantings, etc for the past 3+ years
- **Chemicals** Uses a minimal amount of chemicals. Ideally no pesticides and minimal herbicide.

#### Farm Business

- Adjusted Gross Income Maximum \$900,000 adjusted gross income for the producer, not the farm.
- Financial health Minimum 20% working capital / gross revenue, Lower than 35% debt/asset ratio
- **Proven Skill and Experience** We work with established farmers who have a deep relationship to one area and a record of creating success from their existing context.
- **Physical Equipment** Reliable equipment (tractors, cultivators, no-till drill) that can be readily be used in an organic system to minimize the need to take on more debt
- **On-Site Storage -** Not a requirement but preferred depending on the distance to the buyer.

#### Personality

- **Growth Mindset** We work with farmers who have an appetite for learning, whether from their peers, from the literature, or from failure.
- **Determination** We work with farmers who are determined to succeed and have a knack for overcoming setbacks.
- **Values** We work with farmers who value the ecology of their land on a long term basis. Farmers that think 50 years into the future, not just the next season.

# // ASSUMPTIONS

Construction of the financial model and assessment of regional performance was based on several assumptions, which have been vetted through extensive research and consultation with experts. In general, assumptions erred on the side of caution to produce conservative estimates of outcomes.

#### Modeling assumptions

- The model assumes \$100 per acre per year during transition will be enough. \$100 covers the gap during an alfalfa transitioning area with high fixed costs, such as rent. \$100 covers the gap in areas with a low rental price to allow for a green fallow or alfalfa transition.
- The assumption of a 19.2% reduction in yields after organic transition is based on a meta-analysis conducted across 115 studies and over 1,000 observations of organic performance.<sup>70</sup>
- The assumption of up to 1.0MT CO2 equivalent sequestered per acre per year is based on a study by the Organic Farming Research Foundation.<sup>71</sup>

<sup>&</sup>lt;sup>70</sup> https://ofrf.org/sites/ofrf.org/files/staff/Climate\_Guide\_FINAL-F\_WebRes.pdf

<sup>&</sup>lt;sup>71</sup> https://ofrf.org/sites/ofrf.org/files/staff/Climate\_Guide\_FINAL-F\_WebRes.pdf

- The assumption of 0.4MT CO2 equivalent per acre avoided from N2O emissions is based on the 2017 EPA inventory of GHG emissions<sup>72</sup> and an FAO study stating that synthetic fertilizer elimination minimizes N2O emissions in agriculture.<sup>73</sup>
- The assumption of costs to land owners through taxes and insurance was set at 2% of the total land value. This assumption is based on various data across the web showcasing that a typical property tax is 1% and liability insurance is 1%. When land is rented, owners cover their costs, plus 1-2% additional charge of the total land value.
- The model assumes that when the farmer is renting their farmland, their rental costs are generally double the landowner's tax and insurance costs.
- Organic pricing will remain stable over the next 10 years. It will most likely fluctuate, but our best guess is that the prices will increase from the demand continuing to outpace supply.
- Organic input costs are comparable to, if not cheaper than, conventional.

#### Regional assumptions

- Pricing for organic is the same regardless of region.
- The organic yield deficit will be comparable to 19% meta analysis calculation.

# // TOOLKIT

To facilitate a smooth transition, farmers will be given access to numerous planning and tracking tools. The following are examples of resources that farmers can use to support decision making, increase confidence, and streamline processes.

- <u>Farmer's Edge</u> private full enterprise data, planning, and management tool
- Granular private full enterprise data, planning, and management tool
- <u>Climate FieldView</u> private full enterprise data, planning, and management tool
- Easy Farm private accounting software suite tailored to farm operations
- <u>Organic Transition Planner</u> university-produced planning guide; includes budgeting, record keeping, and strategy building tools
- <u>Documentation for Organic Producers</u> record keeping tool for certified organic producers
- <u>FarmOp Capital</u> operating capital lender that uses crops (not land or equipment) as collateral
- COMET Farm modeling software that can project CO2 and N20 flows on a
- <u>Cool Farm Tool</u> environmental outcome tracking software; includes field-level emissions, biodiversity, and water data
- USDA Risk Management Agency Agent Locator USDA tool to identify a local farm insurance agent
- <u>ROTOR</u> organic crop rotation planning tool
- <u>Pest Management in Organic Production Systems</u> NRCS-hosted webinar on preventative pest maintenance
- <u>Getting your Land Ready to Grow Organically</u> university-hosted webinar on soil preparation prior to organic transition
- <u>Capterra</u> website that compares and contrasts the various existing tools

<sup>73</sup> http://www.fao.org/3/a-al185e.pdf

<sup>&</sup>lt;sup>72</sup> https://www.epa.gov/sites/production/files/2019-04/documents/us-ghg-inventory-2019-main-text.pdf

# // FINANCIAL SCOPING - WHAT WILL IT TAKE TO FUND THIS FUCKING MADNESS?

Based on our previous experience working with farmers we outlined the team and salaries that we think would be needed to properly assess and maximize the chance of on farm success. Paying our employees well decreases turnover and increase trust with our on the ground network as they interact with a familiar face over the years.

Core Team that does not expand linearly with more projects:

- 1. 1x Manager of Program to develop new projects, maintain current project, oversee due diligence, maintain investor relations, pick up the slack where it's needed \$100k minimum
- 1x Organic Farm Enterprise Guru to fully understand and objectively assess the financial history of a farm -\$80k min.
- 3. 1x Master Organic Agronomist to ensure the on the ground specialist are being effective in their recommendations and planning \$80k min.

Team that expands linearly with more projects:

- 1. 1x NRCS expert per state to access EQIP and FSA funding \$80k (half of salary could be covered by NRCS)
- 2. 1x Organic Agronomist per 25 farms trained through MADs farm planning program \$80k
- 3. 1x Marketer and Crop Sales Specialist per state \$80k

\$260k per year for core team and \$240k per farm cluster per year = \$500k per year

# // WHAT'S NEXT?

#### Actionable steps towards launching

- 1. The Perennial Fund and Mad Agriculture refine the conceptual model presented in this White Paper, either iterating on the \$100 per acre transition payment or co-developing another model.
- 2. The Perennial Fund and Mad Agriculture sign memorandums of understanding and nondisclosure agreements.
- 3. Mad Agriculture develops and tests the MVP to gauge farmer interest and understand the target customer.
- 4. Mad Agriculture selects 1-15 farmers for the first round of transition investment (based on due diligence and mutual fit)
- 5. Mad Agriculture provides a first consultation for the selected farm(s), identifying a transition mechanism and beginning the first phase of the regenerative farm plan (vision).
- 6. Mad Agriculture facilitates contractual agreement(s) between The Perennial Fund and the farmer(s).
- 7. The Perennial Fund makes the first round of loans to the farmer at the commencement of the transition process.
- 8. Rock n' roll.

# // CONCLUSION

We can help shepherd our farmers and Earth away from the dehumanizing and commoditized industrial systems that reap the rewards from dominion and overwhelming suffocation. This is a way out. The conditions are ripe for a regenerative revolution to revive and restore our relationship with the earth and one another, to tell a new story.

Through ancient wisdom known for millennia, non extractive capital with skin the game, and active market participants helping all, we will build a strong farm economy and healthy Earth that stands upon a foundation of

incredibly rich principles, universal and human. Our model provides a roadmap for farmers of all kinds a path forward.

After diligently creating a financial model using historical data, region specific enterprise budgets, and financial creativity, we are confident that loaning the necessary capital to great farmers to transition to organic while de-risking their transition through fully individualized support is the most practical way to trigger massive system change.

The data show that loaning a dryland Nebraska farmer \$100/acre/year for 3 years while they transition to organic in exchange for a 20% net profit share for 5 years after their transition will yield a 12% IRR while providing the minimal amount of risk to The Perennial Fund. Coupling this skin in the game approach with a loan guarantee where the NRCS and/or a foundation provides a first loss reserve that is used to cover the risk associated with the investment to insure investor returns while leveraging their otherwise -100% loss to 10 times the impact. The revenue based financing and loan guarantee concepts have both been successfully implemented in multiple sectors from college education to real estate project finance.

The farmer thrives, CO2 is drawdown, investors see a return, and brands tell the story. We have the power to make this happen. We have the opportunity to change agriculture.

This moment will only last for the smallest sliver of human existence and how we act now will determine our future.

Are you in?

# // OTHER VIABLE IDEAS

Though the \$100 per acre loan has been robustly tested though financial modeling and Mad Ags experience with investors, farmers, and brands, there are a number of other possible ways to leverage an investment in regenerative agricultural. Below are ideas that can be further explored through collaboration.

Model	Method
Become a low-interest lender	The Perennial Fund can lend low interest loans to farmers who want to adopt regenerative practices. To hedge the risk The Perennial Fund could use foundation, DAF capital, or NRCS funding as a loan guarantee. A foundation would normally experience a -100% loss, but as a loan guarantee it has potentially 10X the impact. In the capital stack, The Perennial Fund has senior equity rights and the philanthropic dollars serve as a loan guarantee backstop ensuring investor return.
Provide organic acres to brands	The Perennial Fund can lend to brands who wish to expand their organic product lines but don't have capital to invest into farmers. Brands provide the loan guarantee for the fund in exchange for access to new organic acreage.
Become a full operating capital lender	The Perennial Fund can offer operating lines of credit specifically for organic farmers. Priority rates could be given to farmers who employ operating capital for regenerative practices.
Recapitalize	The Perennial Fund can recapitalize the debt of struggling conventional farmers whose interest

debt for conventional farmers	prohibits them from transitioning to organic and more regenerative practices. If a transition to organic were a condition of recapitalization, farmers could start from a blank slate and repay using presumably increased revenue from organic premiums. Interest deferrals could be offered for the three years of transition.
Invest in organic infrastructure specifically	The Perennial Fund invests in processing and transportation infrastructure for organic crops. Farmers wanting to transition and access the new infrastructure pay a fee per bushel/ton. Inability to access infrastructure is often expressed as a main barrier to entry.
Provide insurance	The Perennial Fund provides crop insurance for regenerative and organic farmers.