
SMALL SCALE GRAIN PRODUCTION IN THE U.S.

A report based on a meeting at Paicines Ranch in February 2016
With investment opportunities based on market status in February 2018
Prepared by Amy Halloran, author, *The New Bread Basket*



GREENHORNS



INTRODUCTION

As we sow so shall we reap.

*Supporting small grains in the diverse, regional food economy,
an ingredient in soil health, food sovereignty, and culinary
traditions worth savoring!*

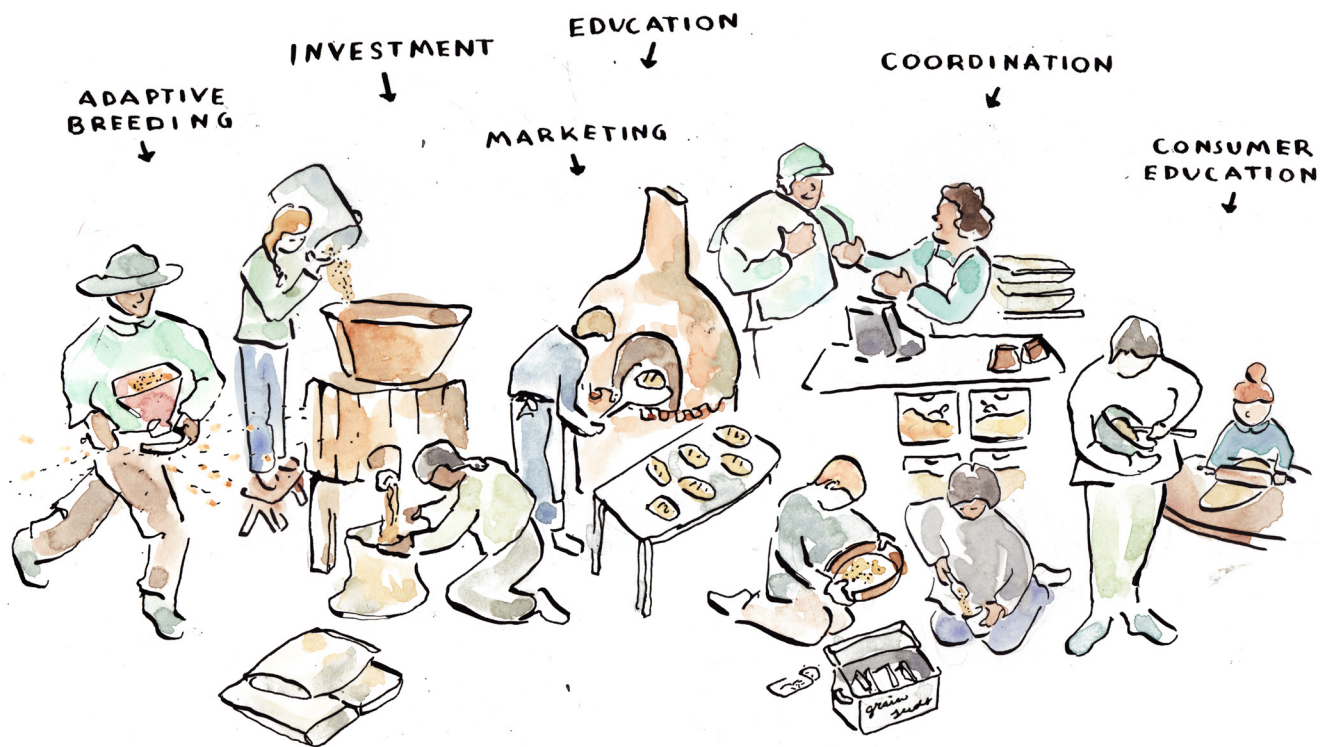
In February 2016, a group of innovators in small-scale grains projects met at Paicines Ranch, California for a first-of-its-kind convening.

We brought together these 40 farmers, millers, bakers and food activists for the purpose of discerning the trends and needs of the local grain movement, to support relationship-building and networking amongst these pioneers ~ and to draw some conclusions about the next infrastructural developments and investments needed by this emerging regional grains economy.

The group represented a broad cross section of this burgeoning sector, all of whom participate in developing the supply chain for a regional grain marketplace. Meanwhile, the majority of US produced, mainstream grains and beans are grown for anonymous commodity markets. Farms are often 2000 acres and larger because the crops are high-volume, low value crops that privilege vast acreages and expensive large scale machinery. These barriers are part of the reason staple crops are late to local markets. Another reason is that they require intermediate processing facilities such as mills and malt houses, which disappeared as farming and food handling consolidated during the early part of the 20th century.

In the late 1800s and early 1900s, agricultural technology, from seeds to machinery, advanced and grain farming consolidated in grain belts around the country (like Idaho/ Washington, California, North Dakota, Kansas). By the 1950s and 1960s, the only milling happening at a local and small scale was for animal feed. Consolidation of grain processing has resulted in near monopoly control by Cargill etc.. who operate plants across the country. Everything from seed to market is preset for this dominant system. Rebuilding regional, and regionally owned, grain production means creating new infrastructure, like community and on-farm mills, on-farm and regional storage and distribution channels, and developing seeds suited to locales, as well as local agricultural knowledge. Beyond these basics, professional bakers and brewers need training. These professionals are used to the uniformity of commodity products, and need education on how to handle the variations that occur when growing and processing on a small scale. Simple logistics of getting regional staples to regional users are challenging, as storage and shipping facilities need reinvention, too. It takes quite a multi-dimensional team to steward these crops seed to loaf and ground to glass.

The people gathered at the ranch are at the forefront of a growing interest in traceable, sustainably produced staple crops. This report is a summary of the characteristics of these farm and food projects, the discussions that occurred at the meeting, and a record of the challenges and opportunities that exist in the emerging regional grains market.



COMPOSITION OF ATTENDEES

The group of farmers, bakers and millers represent 7800 acres in organic or transitional production across the United States in 2016. Many people had toured each other's operations, and/or discussed systems and problems over the phone and by email. Though everyone knew of each other, this was the first time that all of these grains entrepreneurs were meeting face-to-face. There was a lot of excitement as peers and penpals greeted each other and geared up for the opportunity to connect face to face and create and cement relationships.

Mills such as Grist & Toll, Maine Grains, Carolina Ground, Farmer Ground Flour, Bluebird Farms and Hayden Mills were processing 200 to 380 acres of grains. The mills were very new operations, mostly under five years old; the millers already knew each other since there were, and still are, so very few micromills in the country.

The bakers attending the meeting were of two types. The first were micro bakeries linked with 3 to 5 acres of land, and the second type were much larger scale

bakeries that used grains and flour from the standard commodity system. This second type of baker had a professional interest in helping develop alternatives to the products they were using. The interests include flavor, sustainable agriculture, and supporting farming in their region.

The farmers in the group were growing grains using organic practices, but selling them in a variety of ways. Some funneled a portion of their crops to an affiliated mill, and sold other crops to feed, distilling and malting markets. The largest grower, Harold Wilken, had 2400 acres in various small grains in Illinois; the next largest, Willow Coberly of Green Willow Farms had 2000 acres in organic production in Oregon; and Oechsner Farms farmed 1200 acres in New York State. Other farmers were working at a smaller scale, ranging from 10 to 300 acres. One grower specialized in growing between wine grapes and helping other small growers coordinate efforts across Mendocino county.

Regardless of farm size, these farmers shared a common thread with the bakers, millers and advocates assembled, of working to develop regional supply chains. Most grain is grown and marketed for national

supply chains. This restricts farmers' choices, in everything from seed varieties to selling opportunities, to suit the needs of industrialized baking and malting. Grain growers often sell what they grow right out of the field, harvesting into semi trucks. Mills and malthouses purchase grain to meet industry specifications, blending grain from different farms to iron out inconsistencies. Within this framework, there is little room for change, even as consumers desire new foods like heritage grains. In a way, larger food producers like General Mills are more ready to serve consumer interests in ancient and non-gluten grains because they already control the supply chain.

For individual farms to take advantage of opportunities in grains, new market dynamics need to be created. This task falls to the practitioners themselves and the emerging small-grains networks like the Maine Grain Alliance (MGA), a nonprofit dedicated to preserving and promoting grain traditions from earth to table. The organization has helped bulk out heritage seed varieties, and offered technical assistance grants to grain-based businesses, and hosts year round educational opportunities for home and professional bakers. The Greenmarket Regional Grains Project is another strong supporter of grain projects; they work on consumer education and are carving distribution and sales channels for mills and growers in the Northeast to serve NYC markets.

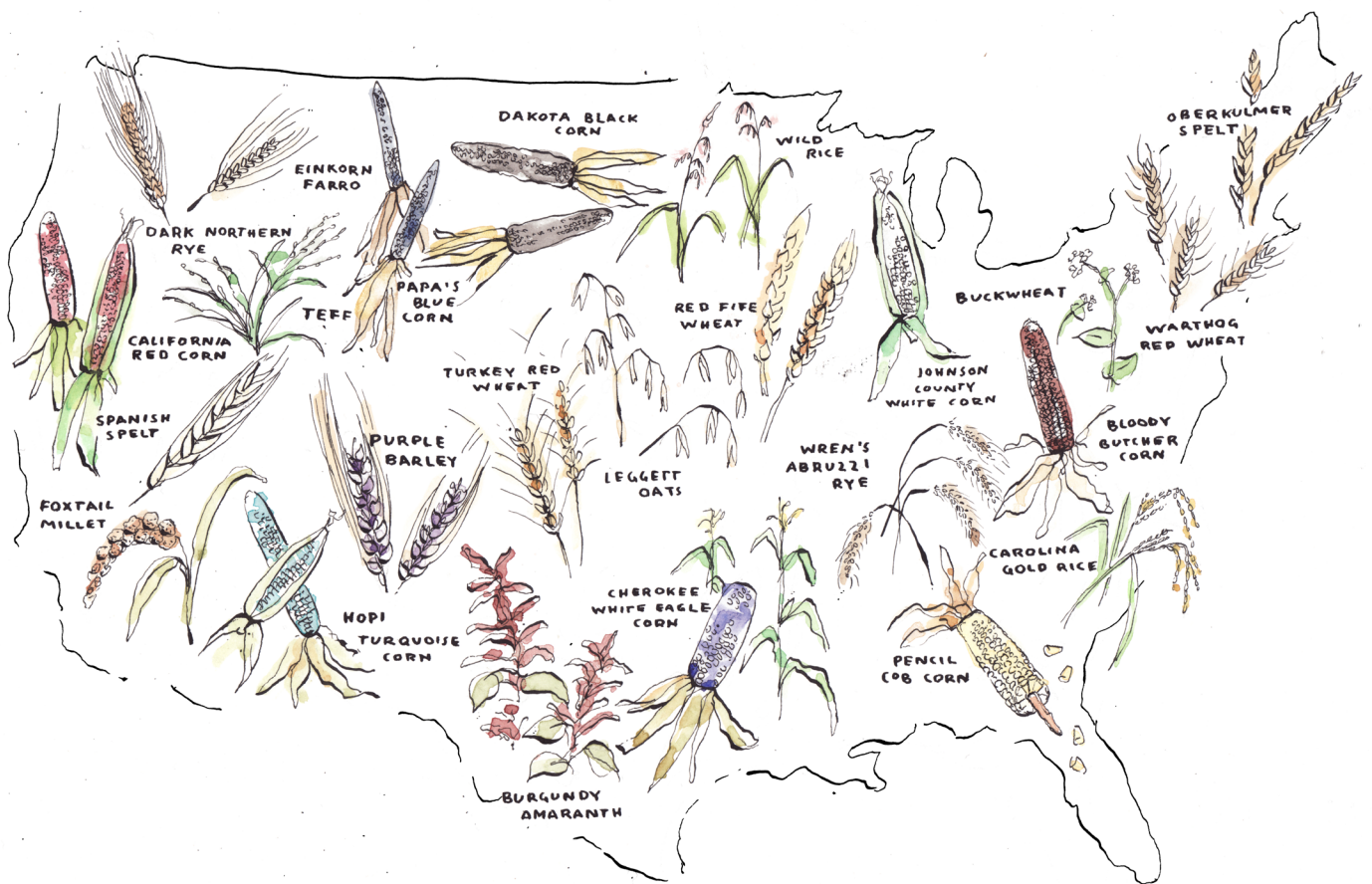
Despite the many difficulties in making new things happen in grains, regional grain economies are establishing, and this gathering allowed innovators to discuss their shared hurdles. Some of these barriers and needs include:

- Seeds that are adapted to locales, and that function well for farmers, bakers and maltsters. This involves field trials & bake & malt testing.
- On-farm seed cleaning, handling and storage facilities.
- Grain hubs for aggregation, processing and shipping and distribution.
- Financing to help create these grain hubs and allow growers to take advantage of specialty grain markets.
- Regional entities/extension & non-profit support to create marketing and logistic channels to stimulate production on farms.

- Find harvesting and processing equipment appropriate to the scale of operations. Existing equipment like small combines are antique, and some equipment, such as seed dehulling, a process required for ancient grains, needs innovation.
- Train new growers and outfit them for success in the sector to help support regional grain infrastructure and take advantage of new markets. Farmers who are growing corn and soy for feed are potential small grains growers. To convert them, there is a need for training in how to plant, tend, harvest and store food grade grain crops.
- Consumer and buyer education to differentiate crops and products from inexpensive commodity equivalents. This need can't be underestimated.

The micromills, bakers, and food activists gathered at the ranch were ready to discuss their common challenges in reinventing the grain supply chain, and making it function at regional and community levels.





KEY ISSUES

FARMING

While the interest in regional grain economies is recent, these new enterprises have been learning from a few people who paved the way, like Vermont dairy and grain farmer Jack Lazor. Jack and Anne Lazor are back-to-the landers whose self-sufficiency efforts expanded into business opportunities. They became leaders in organic dairying; their Butterworks Farm yogurt is made on-farm in Vermont's Northeast Kingdom, and sold from New York to Maine. Jack Lazor is considered the elder statesman of grains in the Northeastern United States because he helped found the Northern Grain Growers Association, a statewide farmers group looking to understand grains for dairy and food production; Lazor is the author of *The Organic Grain Growers Guide*.

This very down to earth leader set the stage at Paicines for discussing the issues of farming grains outside of conventional markets. He presented a slideshow explaining his path with grains, starting with hand

harvesting tools and progressing through several eras of machine farming equipment. The equipment, he said seemed to multiply, because each machine that answered a problem of planting or handling asked for another.

Lazor reminded everyone to keep their eyes on the value of the soil, rather than on the cash values of the crops. Organic farmers say that they grow soil first and food second, but Jack said it was easy lose sight of this imperative when cash cropping grains, since the market doesn't reward the plantings that build soil.

Growing grains at a smaller than common scale and outside of the grain belts necessitates an investigation, like Jack's of antique and vintage tools to solve the farm's mechanical quandries. Contemporary machinery is suited to the large fields farmed in the grain belts, and combines that appeal to this new era of grain growers date to the mid-1960s.

After Jack Lazor's talk and a break, several farmers came to the center of the room to talk about their farms and equipment. This discussion was the heart of

the gathering, as everyone in the room clearly understood that changing grains begins on farms, and these farm innovators deserved big listening. The following list shows the attendees in order of acreage size and presents some of the details of their farming ideals and practices. These growers are American leaders, mentoring each other and carving new paths for farm solvency and crops of distinction.

Mai Ngyuen farms 5 acres in California. Working at the micro scale allows them to focus on the processes they want to emphasize, such as developing soil health, using animal power, and growing very high quality, nutrient dense named heritage grains. They are the opposite of most grain agriculture, which prioritizes yield over all else. Mai uses draft horses to plant, and sheep to mow and stimulate growth after sprouting. “I broadcast wheat seed with draft horses and use the harrow method,” they said. Working no till, it takes 5 years to get a good yield, which is hard to handle as they’re trying to develop their business. Like many farmers, Mai has an off-farm job; they organize farmers into cooperatives. Mai sells their grains directly at farmers markets because their very different farming style, goals and results need face-to-face hand selling and lots of explanation.

Kasey White & Jeff Brodie run **Lonesome Whistle Farm**, a 58-acre dry bean and grain farm in Junction City, Oregon. The couple began market gardening vegetables in 2003, facing a steep learning curve as farmers who didn’t come from farm families, and tough competition in the vegetable sales marketplace. They began adding staple crops as they sought to diversify their offerings, and distinguish themselves within an established local food market place. They direct market their grains through farmers markets in their section of the Willamette Valley and further north in Portland, where the restaurant scene has cultivated a strong interest in alternatives to the dominant food system.

Equipment hurdles are ongoing, since they are too big for doing things by hand, and the machine tools for the scale they work are from the 1960s. This is where their non-farm backgrounds create challenges, since building mechanical skills as an adult is hard. Plus, machines on farms are always demanding; farmers work in time sensitive situations and having to rely on

outsiders for knowledge and repairs is tricky. Kasey & Jeff have developed routines of harvest and handling that suit their circumstances. They rent an old gas station for storage and keep crops stored in 1-ton totes. For chefs and some consumers, they pack 5 gallon buckets with grain and beans, collecting a deposit to ensure the containers come back to the farm. They also store totes elsewhere in rented barn space.

Harold Wilken farms 2500 acres in central Illinois. His family farm is named **Janie’s Farm**, in honor of his daughter who was killed in a car accident.

“I have to pass 25 miles of conventional grain to get to any of my farms,” he said. Wilken and his family were part of that conventional system, and over the fifteen years have converted to organics. They sell into organic commodity markets, and are pursuing value added routes, including building a mill. This transformation has required Wilken to travel; he had no nearby examples to consult as he switched practices, so he found mentors in New York State. Thor Oechsner of Oechsner Farms in the Finger Lakes showed Wilken how he set up his farm to handle and store many small lots of grains; he also shared his rotation practices, which cycle land through 4-6 years, alternating cash crops and cover crops to create conditions that foster plant growth and deter pests and soil borne pathogens. Wilken also looked to New York for models for his mill in progress, studying Farmer Ground Flour, a cooperative which Oechsner founded and co-owns, and Wild Hive for patterns of growing, procuring, milling and marketing grains and flour. Now, Wilken is a model for alternatives to soy-corn in the Midwest, attracting growers who want to convert to organics and value added sales on field days and farming conferences.

“We have to adapt to the atmosphere where we are,” said Wilken, noting that what works for him in his growing conditions and marketing situation doesn’t work for other growers, next door or three states over.

Thor Oechsner, Oechsner Farms and Farmer Ground Flour, Ithaca, NY

Farmer Ground Flour is a cooperative started in 2009. Organic grain farmer Thor Oechsner started thinking about a mill as the housing boom threatened the price of the land he rented to farm in 2005-2006. He and

the late Erick Smith got together with Greg Mol, who built the mill in an old Agway building in Trumansburg. The demand for local staple crops quickly made expansion necessary, and Farmer Ground Flour constructed a new building in 2013. Greg Mol and Neal Johnston run the mill. Dan Gladstone, farm manager for Oechsner Farm, has been key to helping build the organic grain supply.

Thor Oechsner rotates crops on 1200 acres of rented land, growing for feed, food, brewing and distilling markets.

“Local mills help farmers step out of commodity markets, and into sales routes that are less volatile, and more linked to the costs of production,” said Oechsner, who arranges contracts with growers for the mill. “I don’t tell growers a price. I ask them what it costs to grow what we’re going to buy. Because if they don’t make money, we’re not going to have anything to mill. This has to work for farmers.”

Sam Lucy, Bluebird Grain Farms, Methow Valley, Washington. Lucy and his wife Brooke organically farm 300 acres in Washington State, working from plow to package and marketing directly to customers. Bluebird Grain Farms is an early adapter of direct marketing specialty grains, beginning in 2005; they have always focused on distinct grains like emmer and einkorn, which were novel crops at the time. Using the model of growing high quality grains and marketing through direct subscription sales ~ following a CSA, consumer supported agriculture system ~ helped distinguish them from commodity standards.

“Farming is not good for the land. But we can make improvements. I’m spiritually challenged by tillage,” said Lucy, commenting on the fact that organic growing relies on tilling the soil for weed control; this is troubling because it disrupts soil structure and contradicts the foundational principle of organics, which is to primarily grow soil and secondarily grow crops. To follow this instinct, Lucy has eliminated a couple of rounds of tillage. However, he doesn’t own most of the land he works, which limits the length of his rotation cycles.

DISCUSSION ABOUT FARMER EDUCATION

How do you cultivate people who want to make this their life’s work?” Sam Lucy asked, and a number of ideas surfaced:

- New mechanisms to foster farm skills and rural community need to be created because 4-H and FFA kids are indoctrinated with chemical & GMO messages.
- Training opportunities geared to the details of food grade small grains production.
- Training 28 to 40-year-olds who grew up on a farm, left, and figured out the farm is important to them. People are interested in doing something different but have no idea how to do organic production.
- Mentorship program in small grains. Education, especially in machines to get potential apprentices ready for working with established organic grain farms.

ACKNOWLEDGEMENT OF SEED LEADERSHIP

A special session with plant breeders Sally Fox and Monica Spiller brought attention to these leaders. Fox is a cotton breeder and Spiller is a wheat breeder; they are responsible for the wide availability of Sonora white wheat seeds. These women stewarded Sonora from the USDA germplasm bank, and multiplied the samples to production scale. Without their work, this grain would not be leading the way for bakers and millers using grains of known origin. Sonora, and Monica Spiller’s work for the grain, were recognized by Slow Food’s Ark of Taste.



MILLING

Like grain growing, milling consolidated during the late 1800s and early 1900s, shifting as transportation routes developed. While milling may still occur outside of the grain belts, near population centers, the mills are very large and process grains to the specifications of an industry that favors factory baking and shelf stability. This means that grains from many farms are blended to meet the performance characteristics a brand promises and a baker or baking factory expects. The habits of contemporary flour use dictate a homogenous product, and grain kernels are stripped of bran and germ to aid in the pursuit of uniform flours.

Roller milling has been the main mode in America since the 1880s; around the same time grain belts developed and regional milling began to grow out of fashion. Generally, the equipment is too big and expensive to suit new enterprises, and small stone mills are the tools employed by farmers and startups as localized grain supply chains emerge. While stone milling was the way people made flour for millennia, bakers, even very small-scale artisan ones, are used to the available product, which is white roller milled flour. Bakers and bakeries have to adapt to whole grain stone ground flour, and to the lack of uniformity in grain lots that come from specific places.

Developing relationships with growers who can sell small quantities, i.e. 1000 to 2000 pounds at a time, owing to storage limitations at micromills and micro-malthouses has been challenging because that is not how grain growers generally distribute their crops and products.

Another hurdle in this new sector is that milling tends to be a tight-lipped profession, and education doesn't exist at the craft scale. However, this new generation of millers is talkative, and helps each other figure out how to reinvent the flour wheel.

Straddling these challenges requires commitments on both sides of the transaction~ but commitment to quality and flavor has grown some passionate and evangelical converts to a more complicated way of doing business. These efforts are rewarding on many levels, creating jobs in communities such as milling

and baking. New grain enterprises also keep wealth and rural resources from draining off-farm; as farmers gain access to adding value to crops on-farm, or selling crops at higher prices, the stability of farms is assured.

Jeff Zimmerman, [Hayden Flour Mills](#) is a micromill in Arizona. They are located on site at Sossaman Farms, which grows most of the heritage and ancient grains they mill. Jeff got the idea for a mill as he noticed the quality of local vegetables, and began to pursue making a mill so he could explore the quality of local grains.

Hayden owes its success to the relationships that helped make the idea real, such as Pizzeria Bianco, which donated space for the mill. Chef Chris Bianco gave voice to the good flour the mill could make, and that strengthened the burgeoning enterprise, and helps grant it national attention. The seeds for the heritage grains they feature were already in use in Arizona, thanks to Gary Paul Nabham, founder of Native Seeds, an organization that's been exploring plant biodiversity in the Southwest for 35 years.

Jen Lapidus founded [Carolina Ground](#) after commodity flour prices spiked in 2008. Located in Asheville, North Carolina, this micromill is the product of local bakers exploring another stable source of flour. Jen dug for resources, finding funding from tobacco company reparations, locating a mill from her mentor, the baker and oven builder Alan Scott, and establishing relationships with farmers to persuade them to grow organic, named varieties of milling grains. This last part was very tough to accomplish, since farmers grew limited varieties of wheat for the commodity market, and didn't know what to make of someone asking for a crop so different from what they were used to growing.

A baker by trade, Jen understands the needs of professionals, and brings that awareness of flour quality to her milling process.

Amber Lambke founded [Maine Grains and Somerset Grist Mill](#) after she helped her community host a weekend bread festival. In her area, there was a high concentration of oven builders and bakers, and the locavore moment was making people ask why there weren't local grains. Realizing Maine had a history of grain growing, she and baker Michael Scholz began

touring the few existing mills in the Northeast, hoping to find someone who wanted to start a mill in her town, Skowhegan. All the millers No one was interested so she had to assemble funds to start one.

Amber and Michael convinced the county to sell them the former jail, and using Slow Money, Main Street redevelopment funds, and Community Development Block Grants, she created a center of food activity in the old building. The mill is a lever for grain growing in the region, and a separate non-profit, the Maine Grain Alliance has evolved to handle the annual bread festival, The Kneading Conference, and year round grains programming. What began as a grassroots effort has created jobs, and markets for farmers that give reason to grow new foods. The project took years, but is a model for using food to redevelop a small town and its surrounding agriculture, and create connections between rural farming areas and the cities of the Northeast. Maine Grains are carried in Whole Foods, used by bakeries, and retail online and as far as New York City, through Grow NYC, which runs farmers markets.

Nan Kohler, Grist & Toll, Pasadena California decided to open an urban flour mill when she realized that bakers didn't have access to a fantastic ingredient, fresh flour. Startup hurdles included regulation difficulties, as there is no precedent for permitting urban mills; once she found a municipal body in the Los Angeles area ready to work with her, she stuck with Pasadena, even as an initial site did not work out. Having zoning and other regulatory support mattered more than other factors.

Nan taught herself to mill in her garage, and spoke with many of the micromillers across the country as she figured out what type and size of flour mill to buy, how to handle and store grain at her location. Finding growers willing to work with her scale and her interest in named grains of high baking quality has been a challenge, because grains are a high volume low value crop, not grown for identity, or for small-scale distribution. In general, the California wheat crop is a rotation between much higher value crops, and not given the attention or merit desired by this emerging market, and especially this miller.

MARKETING

Differentiating new crops and products is always tough, but in the case of low-value, low-visibility ingredients, the order is taller. Flour and grains are assumed to be bland elements that contribute bulk and structure to foods, rather than flavor. If consumers consider these staple foods at all, they often wonder if they should eat them, as the gluten-free eating trend holds its established market share. Within this food environment, small-scale grain producers and millers are striving to make their products visible, and help people understand why they should prefer them, and pay a premium price. Articulating the functional and flavor characteristics of these foods, and the values behind them, is an important part of growing regional grain systems.

Nan Kohler, Grist & Toll, Pasadena California. Coming from a career in wine selling, she understands how to articulate differences in the product from a consumer and a retail point of view. Creating material and opportunities to discuss those differences is very challenging while starting this new enterprise, yet she works hard with each batch of grain she buys, baking with it to understand the characteristics of flavor and performance she needs to know and describe.

"My goal is to change the conversation about flour, not to sell more bread and pastries, but to discuss wheat," said Nan. "Our histories dictate choices, and this is an alternative to white flour. Consumer education is a huge part of what I do. The more you can tell people about your grains the better. Whatever information you give people, in pamphlets, on bags, online, is gold."

Andy Hazzard of Hazzard Free Farm in Illinois grows distinct grains, including GMO-free and open pollinated varieties; she grows out varieties from seedbanks, and direct markets whole grains, polentas and flours to a discerning consumer and restaurant clientele. She chooses clear bags because they reveal the different grinds and show off the grains themselves.

"I would like to tell more of our story on our packaging," she said, but she doesn't have the resources to create the materials she wants. She did, however, make

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a 22 page catalog with nutritional information and spec sheets; in this catalog, she included tiny details about her farm so that restaurant staff could deliver these details as they are selling meals at the table. Hazzard is a source of information and seeds in this burgeoning movement for regional grains.

Kasey White and Jeff Brodie of **Lonesome Whistle Farm** in Oregon grow and market specialty grains and flours. Like Andy Hazzard, they began as vegetable growers and migrated to foods that have a better shelf life. They sell whole grains and minimally process certain crops, offering chefs 5 gallon buckets for relatively easy transfer. They bought an oat roller and oats became their most successful product at the farmers markets; it's a familiar food, and easily recognized by consumers.

"We've tried everything in the book to add value," said Kasey. "I've made jewelry from grains. We bought a popcorn machine and sling popcorn at the farmers market. The best customers are five-year-olds mad dog staring us down, getting their parents to buy what they want."

Bob Klein, **Community Grains**, Oakland California were driven by seeing how much dishonesty there is in the industry around whole grains. Five years ago they completed a feasibility study for cleaning and storage infrastructure. Now (2016) working on handling 900,000 pounds of local wheat; planning to expand to 5 million pounds over the next five years, selling identity preserved wheat.

"I get nervous about words like terroir. We want delicious healthy wheat, and a vibrant farm economy. We have a sick food system. People want something else. We need a common precise language that identifies the true value someone's going to get," said Klein.

THE FUTURE

Severine von Tscharner Fleming, organizer, The Greenhorns

For 10 years I've been working to welcome young people into sustainable farming. I've been able to see the lifeways of young agrarians, see people be mentored, go through the apprenticeships and successional dynamics fall into place.

Dan Riesenberger, Dan the Baker

I'm working to make the market understand why the project of re-regionalizing our food supply is important. Making this idea more approachable to a larger audience. I want them to see why we are here and why they should support us.

Joe Bossen, Vermont Bean Crafters

I see us trying to create a harmonious scaling of all the sectors. Not presuming what you want to do is what the world wants you to do. Jack and Anne Lazor mentored me and I realized that there are people better equipped to grow food. I'm good at creating a market for underrepresented genetics, like heirloom corn and dried beans. We can never have our priorities be other people's priorities. The durabilities I want to see in place: how can we get the face-to-face connections and supports in place for intergenerational teambuilding and mentorship.

Kate Wheatcroft, Bien Cuit

The bakery is four years old. We spent two years getting rolling and then the last year has been trying to figure out our role in the industry, and what tactics we can use to support transitional agriculture. We started a line of pastry with Whole Foods that uses transitional flour. Talking about how to describe that in labeling and signage. As the bakery outgrows us, we wonder how can we support the agriculture that interests us. Erin and I started toolbox to build connections around regenerative grain projects.

Julie Dawson, Plant Breeder

I've been fortunate in having mentors in farming and rebels in academics working on plant breeding for organic farmers. Even conventional public breeding is at risk funding wise. And now organic plant breeding

public sector is growing. That Monsanto bought up all the seed companies left a vacuum for organic seed companies and that opened up opportunities for working with farmers.

Peter Schmidt, Shagbark Seed & Mill

I have a background as a scenic carpenter, and am now the Miller for Shagbark. I grew up on a corn/soy farm in Minnesota, so I am coming from the land, seeing the value in the land. My journey of going to Ohio comes from a dream and my wife had to make a tofu company. Main reason we moved from Chicago to Athens was the mill, seed cleaning, connections to farmers grow organic; there was stuff there we could piggyback on. I think most people go to college and they don't know what to do and then they say oh crap, I'm 80K in debt. These food hubs are making America a small again.

Severine von Tscharnier Fleming

Our generation suffers \$1.2 trillion in debt. This is also what it would cost to buy the land for young farmers.

Doug Mosel

We need to find underused small parcels to help get access to land and opportunities.

Julie Dawson

There is a dairy apprentice school in Wisconsin delivering practical skills. Farming is like any other career in terms of training, and people don't grow up in it. The technical training needs to come from the farming community, not the academic.

Anne Lazor

At the Agrarian Elders conference, we thought to look for opportunities for beginning farmers on existing organic farms.

June Russell, Greenmarket Regional Grains Project/ GrowNYC

I feel this is professionalizing. When I started working for farmers markets, my friends in the restaurant business thought it was a joke. Now it's a career. We have to acknowledge that this is huge. This is a sea change.

OPPORTUNITIES

The reasons for redeveloping regional grain markets are many. Stepping outside the standard marketing system gives farmers agency from field to market, and a chance to control earnings by working outside of the volatility of commodity pricing.

This type of farming can support shifts from conventional grain farming to organics, and from corn/soy to crops with a lighter environmental footprint. It can monetize grains and other rotational plantings. Mills, malthouses and bakeries in this sector are often cooperatives or community based enterprises that change the landscape of labor and put social values back in the food system.

In the dominant production system, a farmer may never meet a miller, or a baker or a brewer. Baking, malting, milling and brewing businesses all operate using the same ingredients; as craft operations rise, these professionals are seeking ingredients that will further distinguish their products from factory equivalents. Small-scale grain projects change choices from field to loaf and ground to glass, adding economic, environmental and social value for everyone in the supply chain.

ASSETS OF REGIONAL GRAIN PROJECTS

- Economic viability of farms
- Farmer agency by selling outside of commodity system
- Soil & crop stewardship
- Whole grain nutrition
- Social enterprises

Grains have been late to local tables because of the missing links identified by the 40 people gathered at Paicines:

- Few farmers interested in serving this emerging market
- Suitable local seed varieties
- Local crop knowledge for farmers
- Right sized farming and handling equipment
- On-farm and regional grain storage and infrastructure

- Intermediate processing facilities like mills and malhousers
- Facilities & marketing systems for regional storage and distribution
- Baker and brewer awareness of non-commodity ingredient options
- Consumer awareness of staple crops

DEVELOPMENTS

Two years out from the grains meeting, some of these challenges are being met and this sector is gaining momentum. Chefs, consumers, bakers and brewers, are celebrating the flavor characteristics in grains and beans, and demand is rising for regional crops and products.

In the Northeast, this rise in demand can be traced in part to Grow NYC and its Greenmarket Regional Grains Project. This farming and food advocacy organization has worked with land-grant universities, Cooperative extensions, and other groups to build a supply of grains and flours, and the demand for these novelty crops and products. Grow NYC runs 54 farmers markets in New York City, and in 2010 asked its bakers to use at least 15% regionally milled and grown grains. This requirement spurred use of flour from existing mills, and helped develop startup mills. Expanding on a tradition of chef relationships, Greenmarkets's grain work also helped to put regional grains on the menu in restaurants.

June Russell, director of the Greenmarket Regional Grains Project was at Paicines, and her work inspired people in California, Farmer Mai Nguyen, Miller Nan Kohler and Baker Dave Miller, to start the California Grain Campaign. This volunteer run initiative asks farmers markets to require its vendors to use 20% local, whole grain flour by 2020. The campaign is harnessing chef and baker excitement and creating venues for educational efforts by professionals who are already using targeted products. This dynamic educational model is worth studying, copying and repeating to help support regional grain systems elsewhere.

Cascadia Grains Conference, an annual event in Olympia, Washington is building out its programming, adding field days, brewing demos and baking classes to support the emerging interest in the Pacific Northwest.

The Artisan Grain Collaborative in Chicago is doing a similar educational and marketing buildout.

Proof of the success of regional grain economies is the number of grain forward businesses and value-added/direct marketing grain farms that have started in the past two years. Among them are Meadowlark Organics in Wisconsin, New American Stone Mills, and Bakers Field Flour and Bread in Minneapolis. Meadowlark Organics is a 700 acre specialty grain farm starting a grain hub to serve the farms in their area. Bakers Field Flour and Bread is a bakery that mills its own flour, and sells flour to restaurants and other enterprises. New American Stone Mills manufactured its stone mill; this new company is part of Elmore Mountain Bread, a leading craft bakery in Vermont, and serves the growing interest in whole grain milling in craft bakeries.

Food organizations and food media are noticing the demand for new types of grains and bread. Old Ways and The Whole Grain Connection have identified local grains as a rising star for 2018, and Bloomberg declared bread the dish of the year, citing bakeries and restaurants that have bread programs, and use non-standard flours. Consumers are seeking alternatives to the gluten-free trend, especially as awareness of health and environmental issues tied to glyphosate increases. Half of the bakers nominated for James Beard Awards this year are known for sourcing some or all of their flour and grains directly from farmers and small mills.

The environmental and agronomic benefits of small grains are being recognized in the media as well. An article sponsored by FERN, the Food and Environment Reporting Network highlighted work by Practical Farmers of Iowa to push small grain rotations in corn/soy systems as a solution to nutrient runoff caused by aggressive fertilization practices.

To help farmers take advantage of alternatives and facilitate growth in regional grain markets, investment and project opportunities include:

SEED SUPPORTS

- New farming styles need new seeds. This is being tackled at The Bread Lab at Washington State University and many other land grants. WSU's

Skagit 1109 is an example of plant breeding geared to farming and use outside of the commodity system, and the variety is experiencing success in many locations.

- The Maine Grain Alliance has been bulking out heritage seed varieties for the emerging market. There is a need for more identification of seeds suited to regions and grow-out projects to make the seeds available at commercial scale.
- North Dakota State University worked with the Craft Maltsters Guild to run trials in Northern Winter Barley Nurseries. These trials in non-barley regions helped develop crop knowledge and identify grains; similar efforts in bread wheats, such as Julie Dawson's USDA SARE grant testing crosses of heritage and modern grains to improve agronomics but keep flavor, are helping advance the market opportunities in specialty grains. There is room for more research to support consumer interest and farmer adoption.

FARMER EDUCATION

- Cooperative extension agents and land-grants have been preparing materials and field trials for the emerging sector, but in each region, investment in these efforts could expand their reach. There is no check-off program for small-scale grain projects, and without such industry supports, the revival of regional grain production is leaning on grassroots champions. Funding for farmer education to help convert growers and farms to add small grains to rotations and take advantage of the opportunity in specialty grains is needed.
- New mechanisms to foster farm skills and rural community need to be created because 4-H and FFA kids are indoctrinated with chemical & GMO messages.
- Training opportunities geared to the planting, harvest and storage details of food grade small grains production.
- Training 28 to 40-year-olds who grew up on a farm, left, and figured out the farm is important to them. People are interested in doing something different but have no idea how to do organic production.
- Mentorship program in small grains. Education, especially in machines to get potential

apprentices ready for working with established organic grain farms. Could be modeled after dairy apprentice program in Wisconsin and funnel apprentices out to 10-20 year old organic grain operations throughout the country.

CONSUMER EDUCATION

- Grains are the invisible bricks of our daily bread, and bakers need help articulating the difference between commodity flour and the premium products of regional systems. There is a need for bakeries to show their customers they are making something very different, in terms of process and ingredients. Perhaps it is a labeling procedure, like Fair Trade or Organics, to help articulate craft baking and regional grain use.
- Cooking classes & grains education materials to be developed with existing cooking education venues.
- Both the California Grain Campaign and the Greenmarket Regional Grains Project have developed materials and routes to foster consumer knowledge and interest. Need for more of these dedicated to different regions.
- The Kneading Conference and The Bread Lab are annual weekend baking conferences dedicated to new grain chains. Cascadia Grains Conference is similar, and is expanding its educational opportunities throughout the year. Need for more learning opportunities to address local curiosity and build local markets.
- Dialogues to show, tell & taste the difference in regional grain products. From Beer Sessions radio shows on the Heritage Radio Network, to Slow Food & California Grain Campaign discussions, there is a great appetite for storytelling in grains. People pay \$5-\$30 for a chance to hear a group of grain entrepreneurs explain their work, and sample some of the food afterwards. More setups like these, focused on regional producers & specialized grain products could help spur demand and use significantly. A recent event in Minneapolis featured two farmers, a baker-miller and a noodle maker. Seventy people listened to them discuss regional grains; attendees asked how they could support this work. Suggestions from the panel included asking bakeries and restaurants to use regional flour in their products.



PROFESSIONAL INSTRUCTION

Conferences and field days help deliver information from early adopters to curious brewing and baking professionals. However, such education needs expansion.

- The difference between stoneground, whole grain flours and the default commonly used, white roller milled flour is significant. Bakers don't understand how to approach the flours from small mills, and with their cost premium, there's little reason to leap into trying them. Plus, particularly in baking, there is little room for consumers to know the value of regional grain systems; being able to express the difference would help encourage use of the ingredients.
- Farmer Brewer Winter Weekend was a very successful vehicle for knowledge transfer within the burgeoning craft malt industry. Now the Craft Maltsters Guild has its own conference.
- 1 & 2 day grain schools offered by Cooperative extension and other farm advocacy groups, such as Hudson Valley Grain School, Cascadia Grains Conference, Northern Grain Growers Association Conference, Bread Camp - run by Spence Farm Foundation, which links both chefs and medical

professionals to the nutritional capacity of diet.

- Hops market education is provided by Hops Union in Eastern Washington. Brewers come to this school to learn about hop characteristics, and buying and using them. Similar grains-based efforts could be built to help foster a market in malt & milling educations. Once brewers and bakers can discuss these novel ingredients with their customers, use is incentivized and the premium price can be justified.
- The Culinary Breeding Network is an organization that links chefs, plant breeders and farmers to help develop seed varieties with good agronomics and good flavor/kitchen characteristics. Their Variety Showcases are events that highlight partnerships around vegetables and grains and advance a community practice of developing specialized ingredients. This model could be used in areas with strong restaurant/chef scenes to help dedicate attention, communication and energy to the cause of specialty grains.
- Craft milling is not professionally taught. Comparably, there are a few places to learn how to malt on a craft scale, such as Hartwick College, and the Canadian Malting Barley Technical Center. There is a need for formalized education. Right now bakers

are teaching themselves and teaching peers at classes run during baking classes like Wheatstalk, The Grain Gathering and The Kneading Conference.

INFRASTRUCTURE

- Regional grain infrastructure to handle, clean, store and distribute grains.
- The market needs to be organized to distribute intermediate quantities of crops that are produced in bulk. For big mills to take a new product, there's a lot of marketing to tackle. For farmers to direct market on their own, the cleaning and handling issues are many.
- Possible solutions would be building new grain hubs that could take on the necessary storage, cleaning and distribution logistics, or convincing existing mid-size and micromills to add these services to their processing capacity.
- Regional mills and malhousers to facilitate more grain farming and grain use.
- Mills are the purchasing levers that growers need to put new grains in the ground. As mills develop, demand for regionally grown grains increases.
- Malhousers are similar intermediate processing facilities and will also spur farmer adoption of small grains.

INCENTIVES

- Incentives can help push crop adoption and development of mills, malhousers and grain hubs. This was demonstrated by GrowNYC, which asked its farmers market bakers in 2010 to start using 15% regionally grown and milled grains. New York State's Farm Brewery Law influenced a stronger growth in malt houses. The law went into place in 2013 and by 2017 there were 12 malhousers in operation.
- Market entities and licensing bodies have the strength to create similar patterns of growth in intermediate processing facilities essential to encourage farmers to switch from corn/soy and into value-added or specialty grain markets.
- Purchasing patterns are also driving implementation of small grains as crop rotations. This has been the case for organics, as certification requires farmers show their crop rotations. Non-organic

purchasers are now driving the dialogue about soil health and environmental concerns back to producers, through contracts that require farmers to plant certain crops. Contracts change what farmers grow, and can help develop supply and markets for small grains. This could also be stimulated by additions to the Farm Bill.

INSIGHTS FROM THE SURVEY

Joe Bossen, Vermont Bean Crafters

Based on meta USDA data, average income per acre for commodity crops is \$600 for a chemically managed field of commodity grain or soy. University of Iowa studies proved out cereal legume rotations have reduced the need for off-farm inputs by more than 90% relative to chemical farming. Growing organic beans and grains to service direct regional markets (vs. national commodity markets) creates a situation in which growers can gross well beyond \$1,200/acre, or double the chemical commodity revenue despite lower yields with diminished costs of goods sold (due to OP saved seed, no fungi-, herbi- pesticides). Extrapolate that increase in net income per acre across millions of acres currently under chemical commodity management.

Investment Ideas

Under \$10K

1. Varietal selection, supporting grower breeder networks.
2. Technical assistance for post harvest handling logistics.
3. Marketing and communication support.

Under \$50K

Send cleaning equipment (opportunities for cooperative owned or accessible)

Under \$150K

Pool of micro-loans (@ 1% prime) or grants available to growers via Extension, Grain Growers Association, or NOFA or other NGO to access for innovation, ideas or emergent needs.

Over \$150K

Grain lab for quality assurance with flour phytosanitary testing facility for seed in more locations Grain specific curriculum development @ land grants being sure to address how grains integrate as an aspect of most all other forms of ag.

Jen Lapidus, Carolina Ground

Our organic growers have weed pressure as their obstacle in a standard soy, corn, wheat rotation. If we support/encourage diverse food grade rotations, this

will hopefully lead to reduced weed and disease pressure to hopefully spur more markets for our growers to meet the consumer demand for regional & local foods.

Investment Needs

Under \$10K

Seed support to place heritage seed on farm that is more of a risk in terms of yield + disease.

Under 50K

I want/need a more sophisticated grain conveying mechanism to deliver grain to hopper (\$10,000); I also need an in-line zig-zag aspirator (\$10,000) to account for our lack of sufficient food grade grain. Our lack of sufficient food grade grain cleaning infrastructure in state + provide a final cleaning before the hopper; replace our bucket elevator delivery flour from mill to pneumatic conveyor (\$10,000) so we can increase our thru-put, cool our stones and most importantly allow us to move between grains efficiently w/out waste; finally, a variable frequency drive (\$2,000) to slow down our rotation & double our thru-put capacity pretty please.

Julie Dawson, Seed Breeder

Small grains are good for diversification, and can be a value-added product if each actor can capture enough value. May be hard to compete when feed grain prices are high because it takes a lot less work/risk to grow feed grains. Farmers who are growing/milling/baking themselves tend to feel that they get a good value for food grains.

Investment Ideas

Under \$10K

Seed multiplication of the same successful varieties to an amount that could be grown out by seed producing farmers. The most challenging piece to multiplication is getting from a few hundred grains to enough to plant an acre or two w/o field scale equipment.

Under \$50K

Small scale dehuller for ancient grains. This was a project at Cornell that made a prototype and for about \$50,000, they could develop a model farmers could build or have custom made for under \$10,000 that would work for emmer, einkam and probably spelt.

Under \$150K

Regional coordinators and a national coordinator for a clearinghouse database of expertise / resources/ and for making educational workshops and other peer-to-peer networking happen. I think this is one of the key aspects to why French organic + artisinal bread wheat

project succeeded - the Reseau Semences Paysannes Network makes it possible for farmers, millers, and bakers to work together within and between regions. This will probably start at under 150,000 but could easily use more if it really takes off.

Amber Lambke, Maine Grains

Investment Ideas

Under \$10K

Technical assistance, single pieces of equipment, adding key personnel to a business sponsoring education.

Under \$50K

Equipment, mobile cleaning and harvesting units, expanding to value-added components that improve margins, sponsoring regional gatherings.

Harold Wilken, Janie's Farm

Investment Ideas

Under \$10K

Individual grants help farmers research varieties for their farms.

Under \$50K

Transition assistance from government to ease the move to organics.

Small scale processing infrastructure grants.

Monica Spiller, Whole Grain Connection

Wealth will be built by a well-managed rotation system that builds the soil without the purchase of ameliorants. Rotations - diversity of crops for sale and that are diversely valuable monetarily. Production of high quality grains equals more rich soil. Possibility for localized whole grain products, which we need to combat obesity, diabetes, cancers, heart disease, all of which are devastatingly expensive to treat and waste lives.

Kate Wheatcroft, Bien Cuit

Investment Needs

Under \$150K

Milling. We lack a major regional mill that produces flour w/ consistent results. Mills need test bakeries in order to do this. Having something like this regionally on a known route is crucial. Larger adoption of regional flour also requires competitive distribution centers + tailored distribution that is based on the industry it serves.

WHAT INVESTORS SHOULD KNOW

Joe Bossen, Vermont Bean Crafters: We can't eat accrued interest from arbitrage + speculative investment etc. Technical systems will never win out against biological systems given enough time. Regional land based investments are uncollated rushes to market index instruments. Geometric returns. Ex. Beans > 50x seed > 1,000x the harvest (save 500 for seed, sell 500) > 500 > 10,000 (save 5,000, sell 5,000) etc etc

Jen Lapidus, Carolina Ground: This is a very tight margin endeavor and is not going to generate substantial returns. It is still very early on in the movement and kinks are still getting worked out, and learning can be costly.

Thor Oechsner, Oechsner Farms & Farmer Ground Flour: I think the biological nature of what we do as farmers. These are not factories.

Willow Coberly, Greenwillow: In order to support true "community grains," there has to be support throughout many years. It DOES NOT WORK to tell someone you will buy from them after they get certified organic or after they have reached a certain production level. People must be supported through transition and first year production.

Julie Dawson, researcher: We need small businesses to be profitable/successful in order for a regional grain economy to be successful. This will take some public sector philanthropic investment to get the infrastructure to the point where things are self-sustaining

Amber Lambke, Maine Grains: This is capital and infrastructure intensive. For startups to break even in 3-5 years may be very difficult. There is likely not "fast money" to be made. Think grants, long ramp-up time, and very low interest loans.

David Kaisel, Capay Mills: I'd like people to know the big picture rationale of these endeavors, and that the issues we are trying to address, such as farm economics, nutrient density of products and environmentally responsible farming, are systemic. We are not just trying to sell grain. We are trying to change our food

system. Also, a key challenge is affordability and access for underserved populations

Mai Nguyen, Farmer: The importance of small farms in a foodshed and of heritage grains.

2018 Update on Harold Wilken and Janie's Farm, and now The Mill at Janie's Farm

The mill is up and running, and while some bakeries are enthusiastic about the flour, like Ellen King at Hewn, the reception has been sobering.

"I assumed I could walk into Chicago and say here I am, what do you want?" said Wilken. "I'm competing with a roller mill in Utah, and the big bakers can't afford to use me."

Central Milling is the roller mill he mentioned, and the preferred source for many artisan bakeries in the U.S.; economies of scale make this flour more affordable. The other barrier, besides cost, is a familiarity with whole grains. Craft bakers are used to white flour, and their systems, from cost through recipes and approaches to handling dough, are set to the specifications of this main ingredient. While the Artisan Grain Collaborative is working to help change demand, and bakeries like Hewn in Evanston are featuring this flour, Wilken is traveling further than Chicago to find markets.

If he could hire a specialist to introduce his products to the Chicago supermarkets, restaurants and bakeries, maybe he could edge into these nearby sales. But logistics are tough; he's working on distribution, and that's a key part of making this new flour model work.