



Ag Innovation News

May-July 2023, Vol. 33, No.2

The newspaper of the Agricultural Utilization Research Institute

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Making Progress Year After Year

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I HOPE YOU
WILL JOIN ME IN
CELEBRATING
AURI'S
ACHIEVEMENTS
AND THE
MEANINGFUL
WORK OF ITS
STAFF AND
ECOSYSTEM
PARTNERS

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Next month marks the end of the current fiscal year and I think it's an opportune time to look back on the excellent work accomplished by AURI's dedicated and expert staff. Throughout the year, AURI conducted research, disseminated public information, built strategic collaborations and placed a strong emphasis on innovative projects with the potential for near-term implementation and impact. Thanks to these efforts, I'm proud to share that AURI achieved several important outcomes while expressing its mission of fostering long-term economic benefit for Minnesota through value-added agricultural products at every step.

AURI made significant progress in supporting Minnesota's agricultural industry.

Based on the most recent fiscal year data, AURI worked on more than 250 projects across its focus areas— Food, Coproducts, Biobased Products and Renewable Energy. The addition of new staff members in recent years, especially in meat science, analytical chemistry and emerging crops, supported this increased activity.

These staff additions added to the entire organization's bandwidth, giving AURI the capability to develop a larger portfolio of work to further its positive impact. This is clearly evident when looking at the number of projects opened and the number of projects completed, 117 and 114 respectively.

What's more, AURI made significant impacts on communities throughout the state by supporting small-to-medium sized businesses. Thanks to AURI's efforts, these entities reported over the past five years an estimated 413 jobs created or retained across the state, with another 861 future jobs anticipated in the next five years. These same clients expect to invest \$316 million in future capital infrastructure due to AURI assistance, which is in addition to the \$118 million investment reported over the past five years by AURI clients. These investments create ongoing economic impact, benefitting the communities in which the companies are located and advancing new value-added market opportunities for agricultural-derived products.

Additionally, AURI's leadership supported other organizations and entities by collaborating with strategic partners of all sizes to accelerate opportunities and advance the common goal of shining a spotlight on Minnesota's food and agricultural production, innovation and commercialization opportunities.

I hope you will join me in celebrating AURI's achievements and the meaningful work of its staff and ecosystem partners. In the meantime, if you'd like to learn more about AURI's recent successes, I encourage you to visit auri.org and read our library of research reports, guides and our most recent Annual Report.



This quarter, Ag Innovation News highlights AURI's newly elected Board Director, Lauren McNamara. Ms. McNamara is the Vice President and Assistant General Manager of the Plant-based Food and Beverage Business at SunOpta. She leads a business that includes manufacturing finished goods for brands and retailers, bringing to market innovative plant-based ingredients and managing three consumer brands. In this edition of AIN's Board Q&A, she shares her perspective as a new board member and her thoughts on AURI's potential.



Tell us about your interest in value-added agriculture and why it's important for Minnesota's food and ag ecosystem.

LM: As someone who leads an agriculture-based business with many ingredients sourced from Minnesota, I have seen first-hand how important it is to support Minnesota-based agriculture, and how much growth is truly possible with the right resources. I run a mostly plant-based food business that depends on soybeans, oats and more to grow. In the food space there is so much interest and growth potential for new ways to use plants, get protein from plants and make packaging from plants, that it's exciting to think about the possibilities for farmers across the state.



How did you first hear about AURI?

LM: I worked with AURI through various events in the past such as the Bold Open, providing mentors for entrepreneurs in the food industry and participated in a university class.



Why did you want to join the AURI Board of Directors?

LM: AURI is such a unique organization that occupies a really impactful and important space. Ever since I started working with and learning about AURI, I've been interested in getting more involved. I also wanted to join a board on which I could be an active contributor and fully utilize my expertise as someone who plays a leadership role in a growing agribusiness. AURI is a perfect fit for my interests and skillset, and it's truly an honor to join this group of talented individuals all working together toward a common goal.



What is your leadership philosophy?

LM: My leadership philosophy is to build a team with smart and passionate people, make sure we're aligned on the direction, then let them loose and help remove barriers along the way.



What do you hope to accomplish during your first term as a board member?

LM: I'm excited to help AURI put in place its new strategic plan and help to increase its presence and visibility in the state.



What would you like to see AURI accomplish over the next few years?

LM: I would love for AURI to identify a few large opportunistic platforms to focus resources, promotion, growth and investment.



In your opinion, what are AURI's greatest strengths?

LM: The partnership of the different agricultural orgs across the state all coming together for a common beneficial purpose. I'm impressed with the extensive technical and agricultural knowledge of those who work for AURI and the board that really makes this a unique and effective organization.



In which areas do you feel AURI has opportunities to grow?

LM: I see tons of potential in finding new uses for agricultural byproducts, which is an especially hot topic in food right now, and in biobased products as consumers try to make more sustainable choices. AURI has potential to really accelerate these areas for Minnesota.



AURI Studies Commercial Kitchens, Life Cycle Analysis in Latest Round of Ag Innovation Partnership

- 1 **How can the industry model for shared-use commercial kitchens be improved to better serve Minnesota's growing cottage food industry?**
- 2 **How should a business owner approach a life cycle analysis?**

These are a couple of the questions the Agricultural Utilization Research Institute (AURI) set out to answer via its Agricultural Innovation Partnership (AIP) program.

Each year, AURI solicits submissions from consultants, businesses and researchers, encouraging them to submit a proposal. AURI reviews and selects projects based on submissions most closely aligned with AURI's mission of supporting innovation and creating long-term economic impact.

This year, AURI identified six areas for further exploration. From them, two projects were selected: (1) a research project on the economics of shared-use commercial kitchens and (2) a guide to the basics of conducting a life cycle analysis.

Both projects were selected after conferring with stakeholders, including clients, collaborators and partners to understand information gaps related to the food and agriculture sector. The aim of these initiatives is to identify areas where AURI can have the largest impact, explained Jen Wagner-Lahr, AURI's Senior Director of Business Development and Commercialization.

Shared-Use Kitchens

Shared-use kitchens are critical for home-based food businesses to increase production to meet demand. In recent years, several commercial kitchens have gone out of business or changed hands. Further, a perception exists in some areas in rural Minnesota that there is not enough shared-use commercial kitchen space for growing businesses. For these reasons, and more, a thorough study of the economics of shared-use commercial kitchens, with a focus on rural areas, was a time sensitive project of significant benefit to entrepreneurs and emerging businesses as the state's economy continues to recover from the pandemic, said Jason Robinson, AURI's Business Development Director for Food. Finding and being able to afford commercial kitchen space is a much larger challenge for businesses outside of the Twin Cities metro area, Robinson shared.

"What we've seen is that it's not overly difficult to get commercial kitchen space in the Twin Cities or in some of the other urban areas. However, once you get outside of those areas, it becomes much more difficult," he said.

The AIP study set out to answer a few important questions. Among them: What could be improved in the model for shared-use commercial kitchens? What factors contribute to the success or failure of these operations in Minnesota, and how do these challenges differ in rural and urban communities? Also, what can be done at a state level to foster growth and development in this sector statewide?

"The goal of this project was to understand the economics of the business model and why there is a notion in the marketplace that we don't have enough [commercial kitchen] space," Robinson said.

He stated the target audiences for the report are scaling cottage food and beverage businesses with plans to move from home-based operations into a shared space. Cottage food business owners adhere to specific regulations. While they must register with the state of Minnesota, they don't need a license from the state to operate out of their homes. They are also not inspected by regulators.

"There are many early-stage entrepreneurs that are looking to launch into a wholesale food business. Some of them are content working in their home kitchen, but there is also a segment that is looking to invest in shared-use commercial space," Robinson said. "We have done a lot of work to understand the landscape for food and beverage manufacturing in Minnesota with a focus on scaling businesses. We are continuing to explore the questions, issues and ongoing needs of food entrepreneurs to better understand how AURI can support them."

For this report, AURI partnered with Clutch Performance, a Minneapolis-based food marketing firm and the Food Works Group, an advisory firm serving food businesses. Additionally, the Minnesota Department of Agriculture was a project sponsor. The partners conducted a series of interviews with commercial kitchen business owners, regional entrepreneurial support organizations, legislators, real estate experts, financial lending sources and others active in this space across the state. For the project, the researchers divided the state into three regions: Northern Minnesota, Central Minnesota (including the Twin Cities metro area) and Southern Minnesota. These interviews helped set the landscape and provided a more complete understanding of the legal, regulatory, financial and geographical issues at play for both commercial kitchens and aspiring food businesses.

The issues that emerged were often unique to the specific region, said Troy Schroeder, President of Clutch, and the solutions require a comprehensive approach. The authors recommend that an industry

taskforce should be created to further support shared-use commercial kitchens in Minnesota. This group can advise on issues like additional funding, information sharing and policy changes.

“We set out to validate and test the hypothesis and assumptions we heard on both sides of the equation and then identify potential next steps to address some of the issues that came to light during the research and conversations,” Schroeder said.

Schroeder’s colleague Erin Heidecker, Senior Program Manager at Clutch, said one of the main takeaways from the research was that a knowledge and resource gap exists among commercial kitchen owners and users.

Compiling a shared-use commercial kitchen toolkit is a logical next step, she said. The document should contain a real-time index of available shared kitchen facilities throughout the state of Minnesota; a better understanding of kitchen facilities that might qualify for shared-kitchen use; and guidance on how to onboard an existing space for shared use. There is also a need for more information on regulatory, inspection, licensing and insurance requirements and existing funding opportunities for operating costs and capital investments.

Researchers discovered some innovative commercial kitchen owners with business models that could serve as examples in the industry. For example, in Pine Island, Minn., a business owner operates a commercial kitchen out of a former drive-thru restaurant. Food is prepared in the kitchen and the drive-thru space supports a retail business.

“That business is offering different ways to use and maximize the space. The answer is not always that we need more [commercial kitchen] space. Sometimes it is the industry needs a better understanding of what is in the market. There are idle facilities in some communities but there are also kitchens in restaurants, schools and churches that are not being used throughout the day,” Heidecker said.

Robinson said that AURI was deliberate in working with a broad spectrum of partners to ensure the research and subsequent report is as robust as possible. The project underscores the strength of AURI’s connections in the ecosystem.

“We don’t just work in a silo with one organization. We are taking a systemic approach with subject matter experts to help us solve challenges for our food and beverage economy,” he said.

Life Cycle Analysis

The second AIP project was a primer for small, early-stage entrepreneurs who have hired, or are considering hiring, a consultant to conduct a life cycle analysis of a product. In a life cycle analysis, researchers quantify the environmental impacts that result from the production and use of a product to create a ‘cradle to grave’ assessment of the products used. The aptly named ‘cradle-to-grave’ assessment considers impacts at each stage of a product’s life cycle, from the time natural resources are extracted from the ground and processed through each subsequent stage of manufacturing, transportation, product use and ultimately, disposal. By using this data, researchers can formulate an estimate of a product’s environmental impact, such as carbon footprint as well as water and air quality.

These analyses are becoming more popular, and in some cases even required for business owners seeking different funding sources. The assessment can also be a significant investment in time and money.

This project will help clients form a productive relationship with a life cycle analysis consultant and provide them a solid understanding of the questions that should be considered before the process starts, and as it continues. Small and medium-sized business can use the life cycle guide to understand the basic concepts of an analysis, the steps for execution and potential benefits.

“There is a gap in knowledge in the marketplace, especially at the early-stage level with respect to life cycle analysis,” said Dr. Luca Zullo, AURI’s Senior Director of Science and Technology. “It is not a complex process to go through for an entrepreneur, but it is a confusing topic. It can be easy to lose track of some of the most important information. We felt it was important for our clients and others to have a basic understanding of what these analyses can deliver, along with what the common pitfalls are.”

The guide provides information on how the life cycle analyses are applicable once completed and how a business can use it to differentiate products in the marketplace. The report also includes questions a business owner should ask a life cycle analyst before starting a project, as well as during the process.

“A life cycle analysis can be a powerful marketing tool in the food and consumer products goods space. Entrepreneurs want to show they have a climate and planet-friendly product,” Zullo said. “To be able to do so, one needs to understand what the data says as well as the language and the boundaries of these reports. What we have set out to do with this project is advance conversations and provide the framework for an entrepreneur to make some decisions down the line.”

AURI partnered with technical consultant Evalueserve on the project.

This is the fifth installment of the AIP, which was designed to catalyze innovation, generate new ideas and support collaborative partnerships in Minnesota’s value-added agricultural industry. The projects selected to the AIP program receive match funding from AURI. The information generated through the AIP funded proposals will help entrepreneurs, producers, businesses and agricultural processors explore opportunities and technologies in the areas of biobased products, food, renewable energy and coproducts. A variety of channels are used for public dissemination — including AURI Connects events — that support agricultural innovation and create long-term economic impact.

Past research through the program produced applied research studies, as well as guides and tools to help businesses utilizing the state’s agricultural products. Past projects include: Demystifying E-Commerce and Digital Marketing, Building and Enhancing a Food Fish Industry and More Food Recovery Opportunities, Less Food Waste.

Asmus Family's History of Innovation Leads to Ag Innovator of the Year Award

By Dan Lemke

People aren't likely born with an innovation gene, but if there was such a thing, the Asmus family of rural Winthrop, Minn. would likely have it in their DNA.

The Asmus family established their farm in Sibley County in 1910. Like most farms of the day, diversity was the name of the game. However, by the mid-1960s, the family put up several large barns and began focusing on egg production.

"Our grandfather and great uncle started to focus more on poultry," said Adam Asmus. "At that time, people around the area kind of thought they were crazy for going into something like that and specializing in poultry."

Adam Asmus' parents took over from his grandfather in 1988 and expanded the operation. The farm grew again in 2013, going from 180,000 laying hens to about 550,000 birds.

Value-Added Avenues

In addition to producing millions of eggs each year, over half a million chickens also produce copious amounts of litter, which is an excellent source of nutrients for the soil.

"We had used the poultry litter on our farm for decades," added Michael Asmus. "As soon as our grandfather and great uncle built those first barns, that was really when we started to use the poultry litter. We've always used that product on our own land with great success."

When the farm expanded in 2013, a manure drying system was added to tap into the bulk fertilizer markets.

"We started drying the product down just to see what we could do with it, and we found that there really wasn't a major market opportunity, because while the manure was definitely drier than it was before, it still was really bulky and kind of hard to move around," Adam Asmus said.

"We had a couple of farmers who were interested in the dry product, but because it was so light and there was so much volume but so little density, we could fit maybe two or three tons on a 10 ton truck," Michael Asmus recalled.

Michael and Adam Asmus knew pelleting the litter would increase the density of their dried poultry litter, but they found the prospect of purchasing the necessary equipment to be cost prohibitive. But by 2017, the brothers felt it was time to take a serious look at pelleting the chicken litter. They enlisted the help of Alan Doering and AURI's coproducts facility to analyze the potential and to conduct test runs to help establish a process for making pellets. Not only would pelleting the litter make it more cost effective to ship, it would also eliminate some environmental concerns.



“We were quite concerned that the Minnesota Pollution Control Agency was going to either severely limit or ban the winter spreading of manure because of the runoff that can occur,” Michael Asmus said. “Our main goal with this whole effort was to figure out a way to handle this material so that there would be less of a chance of any sort of potential runoff or any potential problems with us having to try to store the manure and then figure out a way to spread it in the springtime before farmers plant.”

By 2019, the brothers decided to move ahead with construction of an on-farm drying and pelleting system. Rather than utilizing natural gas or liquid propane to power the drying system, they installed a biomass-powered system.

“We were trying to find something that would be more carbon neutral and wouldn’t be so expensive when you’re having to use a huge quantity,” Michael Asmus said. “We were able to find a company that was creating biomass burners. That’s what we use to pasteurize the product so there are no pathogens in the litter. We use pelletized and post-consumer recycled pallets, and that has really worked very well for us the last couple of years.”

Adam and Michael Asmus formed a separate enterprise called Agricultural Innovations, LLC, and began marketing litter-based fertilizer under the High Island Organics label, named for the watershed in which the farm resides. About 95% of the High Island Organics fertilizer is sold to community supported agriculture farms, vegetable gardeners and row crop farms, while the brothers market the remaining five percent through more than 30 Midwest retail locations.

Several years ago, the brothers again sought the assistance of AURI to help develop some additional fertilizer blends.



One thing that is big on the retail side is to make specific blends for different types of plants,” Adam Asmus said. “That was the next phase for us and now we actually have two new blends coming into the retail space this spring.”

High Island Organics offers an all-purpose fertilizer, a garden vegetable blend, lawn blend and a biochar soil amendment, which utilizes ash from their biomass dryer.

Innovation Recognized

Not only is its fertilizer product gaining a foothold in the marketplace, but Agricultural Innovations, LLC is also being recognized for its innovation. AURI selected Agricultural Innovations, LLC as its 2023 Ag Innovator of the Year. The award recognizes a Minnesota company that is achieving commercial success and utilizes agricultural products in an innovative way.

“They truly took a leap of faith,” Doering said. “They invested capital into an additional large facility right on the farm site. They focused on how to add value to the manure, and they took the steps to move forward.”

“Agricultural Innovations, LLC and their High Island Organics brand has taken an innovative approach to the fertilizer business,” added AURI Executive Director Shannon Schlecht. “Although fertilizer may be thought of as a less innovative category, the forward-looking vision at Agricultural Innovations to create a circular approach utilizing their livestock coproduct was notable. Not only did they create a circular pathway, but they also looked at gaps and opportunities which resulted in creating specific fertilizer applications for different plants and uses. They have grown their rural Minnesota business from an on-farm approach into a regional market opportunity.”

The Asmus brothers credit AURI with helping them grow their business and they appreciate the recognition of their efforts.

“If it wasn’t for AURI, I don’t think we would exist, honestly,” Adam Asmus said. “It’s strange to think that what we’re doing is being seen as innovative because we live it every day, but it’s great to be recognized by others.”

“It always feels like we’re working in our own silo, so it was very humbling to receive this award, something that we never thought possible,” Michael Asmus explained. “It’s greatly appreciated that the things we’re trying to do are being recognized by the people who helped us.”

High Island Organics received the Ag Innovator of the Year award at the 2023 New Uses Forum on April 11.

“If companies aren’t innovating, they are falling behind,” Schlecht said. “Agriculture has definitely changed over the years and market opportunities continue to change with different consumer preferences from different generations. There are so many individuals and businesses in Minnesota that are very creative and are continuously exploring curiosities with us to either create a new innovative product line, launch a new business or become more efficient at what they are doing through process and technology improvements. Simply put, innovation keeps companies relevant and open to change to meet evolving market needs and to take advantage of new opportunities.”

As times change and market conditions evolve, it’s highly likely that the Asmus family will be on the lookout for new opportunities.

“It’s kind of a familial trait to find different ways that we can innovate or try to be as efficient as we possibly can,” Adam Asmus said. “We’re not afraid of trying new things that can make the operation run more smoothly or increase efficiency. We try to be as close to the cutting edge as possible and to be proactive rather than reactive. That’s what our whole mantra is, to look at the future, see what it might hold for us and then try to move in a way that puts us ahead of the game rather than behind the curve.”



AURI's New Uses Forum Explores Innovation and Investment in Food and Ag

The Agricultural Utilization Research Institute (AURI) hosted its annual New Uses Forum on April 11 in Minneapolis, MN. The daylong event featured lively discussions, expert analysis and networking opportunities. The theme for the event was Exploring the Intersection of Innovation and Investment in Food and Agriculture. Compeer Financial and Georgetown University's Rural Opportunity Initiative were event partners.

"The New Uses Forum is about exploring innovation and investment and discussing how we can move things forward to benefit the industry as well as the state's economy and the region's ag industry," said Shannon Schlecht, AURI's Executive Director. "This event brings together a cross section of people. It is an opportunity to engage and talk about what is possible and how we can create the collaborations that are needed to get there."

Scott Caine, President of Aimpoint Research, presented the keynote address. Caine has expertise in the areas of strategic operations, marketing research, competitive intelligence, organizational development and business modeling. Through custom intelligence solutions and research services, Caine and his Aimpoint Research team partner with a broad range of agribusinesses across the U.S.

The title of Caine's presentation was "The Intersection of Business and Agriculture." He shared some of his company's research on the changes occurring in agriculture. He stated that the business model of agriculture is changing rapidly, and it is beholden upon producers to adapt. Farmers and producers that succeed in the future will be the ones that embrace innovation, as well as the wants and preferences of tomorrow's consumers, Caine said. Agriculture will increasingly be about food.

Following the keynote address, there were multiple panel discussions on emerging topics in value-added agriculture. The first was on industrial fermentation, which included panelists Jill Zullo, Global Managing Director of BioIntermediates at Cargill BioIndustrial, LLC; Larry Fox, Attorney at Avisen Legal; Melanie Tomczak, Chief Technology Officer at BioMADE; Ron Meeusen, Managing Director at Cultivian Sandbox Venture Partners, LLC; Brian Brazeau, Partner at Ferment and moderator Jon Veldhouse, President and CEO of Qore LLC.

This panel discussed a range of topics related to how industrial fermentation using agricultural commodities and ag-derived coproducts as feedstocks could provide a sustainable alternative to fossil resource-based products. The panelists also debated how fermentation can create new market opportunities and impact agricultural producers by offering a new avenue for the sustainable economic development of rural communities.

Zullo was asked why industrial fermentation was one of the hot topics in agriculture right now. She said the science of fermentation is at a cross section of several driving factors that are shaping the global economy. Increasingly, consumers want to know more about the environmental impact of their food, clothing

and other products. What they have found is that these products use a lot of petroleum that produces greenhouse gases, which leads to global warming. At the same time, governments are investing money in greener manufacturing and production for things like clothing and beauty products.

"Consumers are driving investors and large companies to have strong Environmental Sustainability and Governance programs. We have seen that sustainability is strong for business. We are also seeing a pent-up demand for more responsible goods and advancements in technology. When those two things collide, it drives further investment and creates a great space," Zullo said.

The next panel was entitled "Driving Health Changes Through Food" with panelists Katherine Paris, Vice President of Advocacy and Policy at Untied Healthcare; Kevin Miller, Principal Scientist at General Mills; Mindy Kurzer, Director of the University of Minnesota's Healthy Food, Healthy Lives Institute; Amanda Karls, Principal at Foodvocate LLC and moderator Kristin Duncanson, owner and partner of Highland Family Farms. The panel explored several issues and questions including the impact of processing on the healthfulness of food, the definition of healthy food, the role of nutrient density and how to best guide consumers toward healthier outcomes.

The panel also discussed how labeling certain foods as "healthy" often has unintended consequences, as well as how the current definition of the term "healthy" often does not consider issues like food access and cultural implications. Moreover, labeling a food healthy can also give consumers a false sense of security and lead to overeating. Rather than "healthy" or "unhealthy" labeling on food products, the panelists promoted a shift in thinking to healthy and unhealthy food patterns.

Miller at General Mills used the example of chocolate milk in school cafeterias. Though chocolate milk does have sugar, research shows that students are far more likely to drink chocolate than white milk. Giving students the option to drink chocolate milk in school is a far better health outcome than for students to drink no milk at all.

“My preference would be that the Food & Drug Administration does not define healthy, and the word healthy would not be on a [food] label because there are many different definitions of health, and certainly within different cultural communities that is true,” Kurzer said.

Kurzer teaches undergraduate students as part of her role at the University of Minnesota. She said many of her students come to class with unrealistic and often untrue ideas about food and nutrition. She shared some of the most common misunderstandings from her classroom. Kurzer said that despite ample evidence showing that gluten is only unhealthy for a small percentage of the population that suffers from Celiac disease, the misconception persists. Kurzer also said that for the most part, her students believe body weight is directly related to how healthy someone is. She would like to see larger adoption and recognition of the idea that people can be healthy at any weight.

The final panel explored how the global economy is affecting farmers and agricultural processors in the Upper Midwest. The discussion was moderated by Bridget Deering, Innovation Strategy Consultant at Compeer Financial; with panelists Bill Moore, Chief Risk Officer at Compeer Financial; Ryan Moe, Regional Director at StoneX Group Inc.; Blaine Nelson, Senior Economist at Farmer Mac; and David Fiocco, Partner at McKinsey & Company. In addition to their comments, the panel also polled the audience on the economic issues and questions that were at top of mind; the most common issues cited were inflation, a possible recession, interest rates and a lack of labor. Forty-five percent of attendees said they were confident in the U.S. economy, which was the most popular response.

One of the main takeaways from this panel was the overall strength of the U.S. agricultural economy. By and large, producers were aggressive in locking in low interest rates, and many have cash reserves available.

“This is a great year for farmers to make investments in their farms and in new technologies,” said Fiocco.

In addition to the panels and keynote discussions, Agricultural Innovations, LLC and the company’s High Island Organics fertilizer brand, was named AURI’s Ag Innovator of the Year (see pages 6-7 for a profile on the winners). The AURI Board of Directors bestows the Ag Innovator of the Year to a Minnesota company or entrepreneur making a substantial impact in the areas of product innovation, uniqueness and commercialization potential.

Based in Winthrop, Minn., Agricultural Innovations, LLC produces high-quality organic fertilizer products using chicken manure. The products are available at retailers throughout Minnesota, Iowa, North Dakota and South Dakota. Brothers Adam and Michael Asmus have worked with AURI since 2017 on product formulation and the development of a pelleted fertilizer product.

“When we first met with the AURI team, we had a product that we knew was going to be useful, but the question, was how do we get it into consumer channels?” said Adam Asmus. “AURI was instrumental in solving that problem.”

This year’s New Uses Forum also played host to the 2023 Bold Open Reverse Pitch session. The Bold Open brought together eight forward-looking Minnesota food and agriculture companies to share innovative industry challenges in need of novel solutions from entrepreneurs, researchers and innovators. The challenges included:

- Help Us Upcycle 3 Million Pounds of Spent Coffee Grounds (Bizzy Coffee)
- Fast Decision Making for Small Agricultural Loans (Bremer Bank)
- Traceability in Row Crops (CHS Inc.)
- Ag Data Wrangling (Compeer Financial)
- Upcycled Food Ingredient Landscape (Hormel Foods)
- Scaling Innovation—Oilseed Crop Pressing, Workforce Training and New Uses (Minnesota Soybean Research & Promotion Council)
- Identifying High-potential Strategies to Deploy Medically Tailored Foods as a Reimbursable Health/Medical/Insurance/Wellness Expense (Step One Foods)
- Recovery of Nutrients from Agricultural-Derived Waste Streams (AURI)

The participating organizations sought collaborators who could help accelerate innovative ideas into the marketplace. Entrepreneurs, businesses, researchers, innovators and others were encouraged to submit solutions to these challenges at the Bold Open website.

The New Uses Forum concluded with the Smash the Senses networking event. Eleven emerging Minnesota food companies, many of which were current or past clients of AURI showcased their latest food and beverage products.

AURI Explores Market Opportunities for Winter Annual Oilseeds



Join AURI Connects: Fields of Innovation and event sponsors Bremer Bank and the Mainstreet Businesses Focused on Food and Agriculture (MBFFA) Initiative on June 9 for “Growing and Developing Markets for Minnesota Oilseeds.” You’ll engage with industry stakeholders and learn more about the challenges and opportunities to meet the increased demand for renewable oil feedstocks, the shifts they represent in the marketplace and the potential utilization opportunities for these crops. You’ll also have the option to tour the Ag Innovation Campus.

Free registration and agenda at: auri.swoogo.com/FOI-Oilseeds-2023.

Date: June 9, 2023

Time: 8:30 AM-1:00 P.M.

Where: Crookston, Minn.
+ Virtual

With the demand for low-carbon energy increasing, refiners and energy companies across the globe continue to look to biofuels as a solution for future energy production. As these markets develop and the industry looks to make continued use of existing production infrastructure, one fuel that appears set for rapid growth over the next several years is renewable diesel.

“Renewable diesel is a drop-in replacement that is chemically identical to conventional diesel,” said Dr. Michael Stutelberg, an AURI scientist, chemistry who leads the organization’s Analytical and Bioproducts laboratories in Marshall, Minn.

While it’s made from the same feedstocks as biodiesel, Stutelberg notes that renewable diesel’s chemical properties allow the energy industry to use existing infrastructure (refineries, pipelines, etc.) for renewable diesel production and distribution, and can be utilized in any application that currently employs conventional diesel, making it an attractive option for an industry that is seeking new, lower-carbon fuel options.

These qualities are set to drive a boom in the industry. Analysts at Goldman Sachs project that production capacity for renewable diesel is expected to increase by 500% by 2025. In addition to renewable diesel, biodiesel production and emerging markets for sustainable aviation fuels will also play a role in shaping the market, driving increased demand for crops and oilseeds like soybeans, canola and sunflowers.

Oilseed Boom?

While increased demand may offer new economic opportunities for Minnesota farmers and energy producers, it is also leading to concerns of feedstock shortages which could have notable impacts on markets for food, fuel, animal feeds and bioproducts that utilize seed, meal and oil from these established oilseed crops.

In an effort to identify options for addressing these opportunities and challenges, AURI is currently undertaking several projects with the University of Minnesota, Central Lakes College and other industry partners. Together, they hope to identify and develop

uses for new winter oilseed crops that would be grown and harvested in addition to current crop acres, potentially providing additional options to meet the increased demand for oilseed feedstocks.

As part of these efforts, AURI is examining market opportunities for two winter annual oilseeds: pennycress and winter camelina.

The goal of this work is to “provide Minnesota’s farmers with new options and opportunities to increase production from their land in a way that fits into current crop rotations,” according to Alexandra Diemer, Business Development Director of Novel Supply Chains at AURI. As winter annual crops, pennycress and winter camelina offer cash cover crops that may complement production of existing crops in relay cropping rotations, opening new opportunities for producers.

While biofuel production will play a key role in developing a supply chain for winter oilseeds, market opportunities aren’t limited to the energy industry. According to Diemers, biofuels are driving the market, but other interesting opportunities for new oilseed crops in non-biofuel markets also exist. Additionally, AURI and its partners are exploring uses for oilseed crops in food, animal nutrition and biobased products. If projections of increased biofuel production are realized, leading to further demand for soybeans, canola, sunflowers and other established crops, winter oilseeds may offer a new, additional option to supply chain stakeholders in multiple industries seeking a new source of oil or meal.

While the development of new market opportunities for Minnesota agriculture is a key driver for AURI’s work on pennycress and winter camelina, interest in these nascent crops is also being driven by other factors. Winter oilseeds offer the potential to create positive ecosystem services, providing continuous living cover for farmland that can reduce soil erosion, lower carbon emissions, reduce nutrient runoff, enhance soil health and protect water resources.

The potential ecological benefits of these crops, coupled with their market potential, has led to wider interest from industry and driven increased funding for research and collaboration.

AURI’s work on winter camelina is part of a wider project led by the Central Lakes College Ag & Energy Center in Staples, Minn. Funding for the project was provided by the Minnesota Environment and Natural Resources Trust Fund as recommended by the Legislative-Citizen Commission on Minnesota Resources (LCCMR).

Continued on back panel >

Supply chain development efforts for pennycress,

AURI Says 'Cheers to Cheese' at Redhead Creamery



Throughout its three decade history in Minnesota, the Agricultural Utilization Research Institute (AURI) has collaborated with hundreds of food and beverage entrepreneurs to help turn their dreams into reality. The organization assists with everything from product testing to recipe development and revision to nutrition labels and packaging to help bring products to market. An excellent example is AURI's work in supporting a couple of young cheese enthusiasts from small-town Minnesota.

Located in Brooten (population 633), Redhead Creamery got its start in 2012, founded by Alise and Lucas Sjostrom and Alise's parents Jerry and Linda Jennissen. After visiting a farmstead cheese plant in Wisconsin as part of a 4-H youth trip, Alise decided at the age of 16 that she wanted to be a cheesemaker. She took her passion to the University of Minnesota where she created her own curriculum around cheese and dairy food quality. In addition, she trained at the Vermont Institute for Artisan Cheese. Over time, her friends and family lovingly bestowed her the nickname, "Cheese Alise."

"Since the age of 16, I told anyone who would listen that I was going to be a cheesemaker, including three different employers. I think people like dreamers and want to support that."

Upon graduating from college, Alise and Lucas lived in Vermont and Wisconsin where she worked in retail grocery and expanded her knowledge of the cheese supply chain. Alise's dream was still at the forefront and eventually she and Lucas made their way back to the family farm in Minnesota. By 2012, her parents were fully in support of her dream, and they joined her and Lucas in founding the company that would become Redhead Creamery. As is the case in many efforts, it wasn't smooth sailing in the beginning as Alise discovered that to build her dream cheese facility, existing farm structures would need to be removed and a milk pipeline added. To help fund the dream, Alise launched a Kickstarter fundraising campaign that ultimately led to securing loans and grants to fully fund the construction. The first batch of cheese rolled out in 2012, and in 2015, the family's business ties grew even stronger when Alise and Lucas became partners in Jerry's and Linda's dairy farm, known today as Jer-Lindy Farms.

An Assist from AURI

The team at the Agricultural Utilization Research Institute played a role in helping the Creamery get its start by providing professional guidance in business start-up and product cost-share, as well as with the development of experimental batches of cheese and nutrition labels. Dr. Jimmy Gosse, Senior Scientist of Biobased and Renewable Energy at AURI also helped identify a commercial yeast provider with proven capability.

"The first call for both of our developments [cheese and spirits] was the most fun. AURI isn't the inventor or the business owner. They're the value-added business incubator," Lucas Sjostrom said.

Cheese Shop and Tasting Room

Guests visiting the Cheese Shop and Tasting Room in Brooten can sample and purchase a wide variety of cheddar-style cheeses, cheese curds, Margie American-style cheddar, cider-washed Topsy Tilsitter, whisky washed St. Anthony (an original created by the team at Redhead Creamery), North Folk whisky washed Munster, and its best-seller, the Little Lucy Brie. All of its cheeses are smaller than a normal wheel to make them more usable for restaurants, cheese counters and home cooks. The Cheese Shop also offers tours on Fridays and Saturdays to those interested in learning more about the cheese-making process.



Award Winning Cheese

In February 2023, Redhead Creamery's Lucky Linda Clothbound Cheddar was named Best of Class and a Top 20 Cheese (out of 2,200 entries) at the United States Championship Cheese Contest in Green Bay, Wisc., the first big win for the Creamery after years of second place finishes. Lucas said Lucky Linda's win was a seven-year process that started with two blown-up cheese vats, but the team persevered and learned along the way.

"Since I first started wanting to be in this industry, I always admired the cheese companies that won competitions," said Alise Sjostrom. "It's hard to believe it's now our team and me. We've won seconds, and thirds, but this was our first outright win of a national contest and to be named in the top 20 of 2,200 was truly humbling." *Continued on back panel >*

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Erik Evans, managing editor
Photography by Rolf Hagberg
Design by russellherder.com

Electronic pdf copies of current and previous Ag Innovation News issues are available on the website: auri.org.

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meanwhile, are being pursued as part of the Integrated Pennycress Research Enabling Farm and Energy Resilience (IPREFER) project led by Western Illinois University and funded by the United States Department of Agriculture National Institute of Food and Agriculture (USDA-NIFA). AURI is part of the project's supply chain development team, working in direct collaboration with the University of Minnesota and other project partners as part of a 5-year effort to explore, assess and develop market opportunities for pennycress.

In addition to applied research, private industry partners are also part of efforts to develop market opportunities for winter oilseeds.

CoverCress, Inc. (CCI), is a St. Louis, Missouri based startup company that has converted field pennycress into CoverCress™, a new-to-market winter oilseed that creates a low-carbon source of fuel and feed. CCI is a key partner on the IPREFER project and is currently planning to make CoverCress seed more widely available to producers in 2024.

In Minnesota, MBOLD, a coalition of Minnesota-based food and agriculture business leaders and innovators, partnered with the University of Minnesota's Forever Green Initiative to explore and develop market opportunities for winter camelina and is supporting efforts to pilot the crop's production as part of a winter camelina-soybean relay-cropping system.

As these promising winter oilseed markets begin to emerge, AURI's research and market development efforts will continue, seeking to ensure that the crops are connected to technically feasible, market-driven utilization opportunities. While the environmental benefits of pennycress and winter camelina look set to play a key role in the crop's marketability, with government policies and consumer demand opening more markets for lower-carbon products, ongoing work characterizing and developing uses for the crops will be critical to developing resilient markets for winter oilseeds in Minnesota, the Upper Midwest and beyond.

A Spirited Future

Following its recent collaboration with AURI, Redhead Creamery is working to launch its next line of products— spirits. Once its distillery is up and running, visitors to the tasting room will have the opportunity to sample whey alcohols, whey fortified wines and whey spirits. Down the road, the Creamery also hopes to develop whey ricotta.

Today, Alise and her family produce cheese 2-3 days per week. What began as a teenage dream has grown into a successful cheese shop and soon-to-be distillery, in the heart of Minnesota. Thanks in part to the kind hearts in Minnesota (and beyond) who contributed to the original Kickstarter.

"I believe this is just the beginning of our cheese love story. All of us at Redhead Creamery are thankful for our journey thus far and continue to grow and love what we do each and every day," said Alise Sjostrom.

If you're not able to make it to the Cheese Shop, Redhead Creamery products can also be purchased online at redheadcreamery.com or at retail outlets in Minneapolis, Minn., St. Paul, Minn. and Fargo, ND. Delivery is also available via Cheese Van to those residing along I-94.

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