



Ag Innovation News

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AURI'S 2024
RENEWABLE ENERGY
ROUNDTABLE
WILL FOCUS ON
ENERGY EFFICIENCY
TECHNOLOGIES FOR
VALUE-ADDED FOOD
AND AGRICULTURAL
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ENERGY OPTIONS
WE TYPICALLY
HIGHLIGHT.

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I write this column looking ahead to Fall and the coming New Year. Change is in the air! On that note, I wish to share that this very newspaper will be transforming from quarterly to biannual. Going forward *Ag Innovation News* will publish in October and April. This will allow AURI to continue to offer more varied content as we continue to develop new ways to connect with our audience. We currently offer content via our Webinar Wednesday offerings, recently started an *Ag Innovation News* podcast, launched a new virtual tool – AURI's Virtual Assistant or “AVA” – to guide food entrepreneurs, and are creating more on-demand short videos featuring easily accessible research and training. Please visit the AURI Connects page on our website to learn more (<https://auri.org/about-auri/connect-w-auri/>).

As we transition into the winter season, one of AURI Connects' signature events, the Minnesota Renewable Energy Roundtable (RER), will be held on December 4, 2024. The focus is on innovation opportunities related to energy efficiency for value-added food and ag processing. In biofuel production, food processing, and agricultural commodity processing industries, electrification presents several opportunities to optimize energy use as well as reduce emissions and operational costs. Electrification of industrial processes is not just a technological shift but is increasingly a strategic move to align with business, industry, and governmental decarbonization goals.

Historically, AURI has focused on biomass-based renewable energy opportunities, which continues to be a major focus in our programs, but this year we will also highlight new innovations and processes that entities may want to understand further as they work towards achieving their sustainability goals. Decarbonization has undoubtedly become a key driver in various sectors as companies work to meet consumer trends, qualify for policy incentives, and support circular approaches for various coproducts.

Electrification of industrial heat is at the forefront of these innovations, offering a pathway to reduce reliance on fossil fuels and decrease carbon footprints. The use of electric combined heat and power (CHP), electric boilers, electric heat pumps, and infrared and induction heating advancements can enable industries to replace conventional natural gas and coal-fired systems with electricity-powered solutions, which reduce emissions and align with renewable energy options.

We hope you will join us at this year's RER to discuss these technologies and their relevant applications in the food and agricultural commodity processing industry. It will highlight new technologies and applications, illustrate Minnesota company case studies, and explore the economics, policies, and broader market trends that are catalyzing these changes.

The December RER is a great way to end 2024 as we approach new projects in 2025. AURI anticipates advancing several value-added sector opportunities in the year ahead, and I look forward to sharing more details on those priority areas in the next newsletter. In the meantime, look for our FY2024 annual report to be released by the end of January 2025, which will highlight AURI's impacts, key initiatives, and past client projects.



Board Member, Minnesota Beef Council

Board Spotlight

John Schafer to Retire from AURI Board of Directors After Nine Years



January 16, 2025 will officially mark the conclusion of John Schafer's nine years of service to the Agricultural Utilization Research Institute's (AURI) board of directors. As a board member, he represents the Minnesota Beef Council, where he serves as chair of the research committee.

Schafer is a fourth-generation farmer whose farm, based in Buffalo Lake, Minnesota, was purchased by his great-grandparents in 1900, who then went on to register a Hereford herd in 1917. In addition to Hereford cattle, Schafer raises soy, corn, and alfalfa.

Along with farming, Schafer has been active in a number of organizations, including the Buffalo Lake Development Corporation and Minnesota Hereford Breeders. In 2006, the USDA Secretary of Agriculture appointed Schafer to represent Minnesota on the Cattlemen's Beef Research & Promotion Board. Schafer represented the Cattlemen's Beef Research & Promotion Board on the Beef Promotion Operating Committee for five years and was Vice-Chairman of the National Beef Checkoff's Product Enhancement Committee for two years.

Schafer joined the AURI board because of his varied experience with AURI. He and his father provided input in the 1980s as to why AURI should be created. As a young farmer in the 1980s, he experienced the farm crisis firsthand. Schafer notes: "Necessity is the mother of invention and AURI was a necessary invention." Later, Schafer worked with AURI staff to create an outline for beef research in Minnesota. "I was impressed with the help AURI provided in creating a research blueprint to address the most pertinent topics facing the beef industry," he explains.

When Schafer joined AURI in January 2016, it was an organization in flux. With a newly hired executive director, he participated in many strategic conversations about the future direction of AURI and priority areas. "I'm proud of what we accomplished in setting the path AURI is currently on. We also made a committed effort to diversify AURI's funding so it would not be 100 percent dependent on state taxpayer dollars. AURI is now partly funded by grants and fees for service."

The AURI accomplishments Schafer feels most proud of include the amino acid single-cell protein research that is being commercialized by Sanos Nutrition, which he calls "visionary," and the recent work to

support the Upper Midwest meat processing industry that was hit hard by Covid. AURI and the United States Department of Agriculture Agricultural Marketing Services (USDA-AMS) established a two-year joint USDA-AMS Cooperative Agreement: Empowering Local and Regional Protein Processing in the Upper Midwest to ensure a viable local and regional small-to-medium-scale protein processing industry.

"I've experienced firsthand how AURI has improved the rural economy over the past 35 years. There is more to be done but the unique way Minnesota has structured AURI – as a nonprofit with an independent board of stakeholders – sets AURI up for continued success."

AURI's greatest strength, Schafer feels, is its people. "I am very impressed with the staff AURI has been able to attract. Many employees have been with AURI for 15 years plus. The staff's loyalty to the organization, commitment to see things through, and dedication to AURI's mission is remarkable."

Executive Director Shannon Schlecht, who began at AURI roughly the same time as Schafer, notes: "John has been a great contributor to AURI's advancements and overall impacts over his nine years on the board. He has brought forth many experiences and skill sets to our organization, has been a dedicated board member, and has represented Minnesota's livestock sector and perspectives in AURI's strategic decisions. His contributions to the mission and valuable insights in approaching novel opportunity areas to commercial possibilities has been truly remarkable. Thank you John for your servant leadership and contributions to value-added agriculture."



SOY OFFERS NEW LIFE FOR AGING ROOFS

By Dan Lemke

Roof replacement can be one of the most expensive repairs homeowners face. According to *Forbes*, the average cost for asphalt shingles on a 2,000-square-foot roof can be over \$15,000. Costs can run much higher for larger roofs or for projects using more expensive shingles.

About seven percent of roofs are replaced each year in the United States. Not only are those roof replacements costly, according to the Northeast Recycling Council, but they also generate more than 11 million tons of asphalt shingle waste each year, and that waste is bound for landfills.

Soy-based roof rejuvenating products are designed to extend the life of aging roofs in a more environmentally friendly way while adding value to one of Minnesota's primary crops—soybeans.

Soy roof rejuvenates, which contain soy methyl ester emulsion (SMEE), moisturize brittle asphalt shingles to extend their life which keeps them out of landfills.

"I like the analogy that soy roof rejuvenates are like applying a lotion to your shingles to keep them moist and rejuvenate the oil that's in them, so the granules are preserved," says AURI Project Manager Becky Philipp.

Once sprayed on a roof, the product soaks into the asphalt layer of the shingles and restores the petrochemical oils that have evaporated over time.

"Soy methyl esters act as a delivery mechanism for whatever proprietary products these companies have to offer," says Mike Youngerberg, senior director of product development and commercialization for the Minnesota Soybean Research & Promotion Council (MSR&PC). "Companies are using soy methyl ester as the carrier for products, but it also puts back lost oil that's oxidized out of roofs. It's the same concept as what we do with the asphalt preservatives for roads."

The roof protection products penetrate the asphalt roof to restore the shingle's flexibility, keep the grit in place, and make the shingles more pliable. Maintaining the roof's flexibility and integrity can both increase its life and save money.

SEEING IS BELIEVING

Several companies, including Roof Maxx®, RoofRestor™, and Peak 301®, offer biobased roof protection products. This summer, AURI and MSR&PC held demonstrations of the roof preservation products on Minnesota homes in Thief River Falls and Sherburn.

“Our goal in this project was to create awareness around some of the biobased products that are already available to consumers,” Philipp says. “If we can get more use for these biobased products through awareness and education, it can increase the market demand for them and that’s good for this emerging industry and its good for agricultural producers. It’s creating that demand for our ag commodities, but also providing a renewable product that’s more environmentally friendly and of value to consumers.”

Companies producing these products state that rejuvenates can extend the life of shingles by about 10 to 15 years with multiple treatments, depending on their age and application timelines. They also note that the products increase shingle flexibility by 50 percent and all have a minimum five-year warranty.

The window of opportunity for application is when the shingles are five to 20 years old. If the edges of the shingles are curled or there are many cracked shingles, they may not qualify for the spray-on application. Typically, granular loss on the shingles cannot exceed 30 percent.

AURI Business and Industry Development Director Harold Stanislawski says manufacturers estimate that applications will last five to seven years. However, depending on the roof’s integrity and weather conditions, applications can last longer, delaying the expenditure of an expensive roof replacement.

“You can apply this product many, many times before you’d equal the cost of a total roof replacement,” Stanislawski notes.

The cost of a roof rejuvenate application is approximately 15 to 20 percent of the cost of a new roof. Costs vary depending on the roof pitch and treatment difficulty and typically range from about \$1.00 to \$1.45 per square foot. The process is simple and begins with a complimentary roof assessment done by a certified applicator. If eligible, the time required for a roof treatment is one to two hours.

MULTIPLE BENEFITS

“What we’ve learned through the work that RoofRestor™, Roof Maxx®, Peak 301®, and the United Soybean Board have done is that these products can make shingles last longer on people’s homes, and that’s a noble achievement,” Stanislawski says. “With today’s high costs, keeping shingles on the roof longer, keeping them out of landfill, or going through an expensive recycling process is just a good idea. The research is out there. It looks like these products work and can be a useful option for consumers.”

Beyond cost-saving, soy-based products have environmental benefits. The United States Department of Agriculture’s BioPreferred program certifies that Peak 301® is 95% biobased, RoofRestor™ is 90% biobased, and Roof Maxx® is 86% biobased.

According to research from The Ohio State University, if one percent of single-family homes applied a roof preservation product annually instead of doing a roof replacement, 5.6 billion pounds of asphalt shingle waste bound for landfills could be avoided each year through the use of SMEE preservation products. The study adds that about 1.1 million metric tons of carbon dioxide emissions could be avoided if just one percent of single-family homes applied a soy methyl ester asphalt shingle preservation product. The roof rejuvenates also offer an opportunity for expanded soybean use.

AS WE LOOK AT THE INCREASE IN SOYBEAN CRUSH DEVELOPING ACROSS THE COUNTRY, WE’VE HAD EXPANSIONS IN NUMEROUS PLACES,” YOUNGERBERG SAYS. “SOYBEAN OIL CONTINUES TO BE IN DEMAND FOR RENEWABLE FUELS, BUT IT’S SMART TO BE LOOKING AT THOSE NEW MARKETS THAT ARE LESS SENSITIVE, INCLUDING ROAD AND ROOF PRESERVATIVES AND CONCRETE RESTORATION.”



Stanislawski says there may be an opportunity to collaborate with the insurance industry to investigate ways roof rejuvenates can be an asset to policyholders. He expects conversations to take place in the future to better understand what information is needed to establish protocols that might benefit both the consumer and the insurance industry.

Regardless of potential insurance benefits, roof rejuvenates appear to be a worthwhile investment for homeowners.

“People understand the value of painting their home,” Stanislawski explains. “After a while, you have to freshen it up and put a new coat of paint on it. We do that to maintain the integrity of the siding. It’s the same thing for roofs. We haven’t applied the same principle to maintaining roofs, because products weren’t really available before. Now they are. I’m glad that farmers and the soybeans they grow can be part of a solution for a better future.”

“It’s a win all the way around,” Youngerberg says. “These products offer another market for soybean farmers, they keep shingles on your roof longer, and they keep them out of the landfill.”

Brewing Up Opportunities for Kernza®

By Dan Lemke

For several years, the Agricultural Utilization Research Institute (AURI) has played a key role in projects intended to further the viability of Kernza®, a perennial intermediate wheatgrass developed by The Land Institute and the University of Minnesota. The Kernza plant features a deep root system that is attractive for soil retention, carbon capture, nutrient leaching reduction, and soil health via regenerative agriculture.

On a three-year project led by the Stearns County Soil and Water Conservation District, researchers evaluated the effectiveness of Kernza perennial grain stands on water quality, the development of sustainable supply chains, post-harvest processing, and the development of value-added uses. The Minnesota Environment and Natural Resources Trust Fund by the Legislative-Citizen Commission on Minnesota Resources (LCCMR) provided funding for the project.

In addition to the plant's agronomic features, Kernza grain can be used as an ingredient in food products including breads, cereal products, and even cookies. One of the more promising avenues for Kernza is the beverage industry.

"We identified that one of the near-term potential markets for this grain was in the malting, brewing, and distilling industries," says AURI Project Manager Matthew Leiphon. "That led us to start reaching out and contacting partners around Minnesota and elsewhere to start identifying how we could develop ingredients and value-added end products."

"We know that there's a lot of promise in this grain for malting, fermenting, brewing, and distilling, so we saw this as an opportunity to continue building technical expertise and commercial applications to see where the sweet spots lie for utilizing this grain in beverages," explains Alexandra Ostlund, AURI business development director of novel supply chains.

Thorough Testing

Because of its unique flavor palette, brewers and distillers have been among the early adopters of Kernza. AURI tapped into the expertise of the Rahr Technical Center (RTC) in Shakopee to learn more about the brewing characteristics of Kernza.

Rahr Malting is one of the largest malting companies in the world and operates North America's largest single-site malting facility in Shakopee. The company operates the RTC to provide testing and analytical expertise on fermented beverages, malt, and other ingredients. The facility includes a pilot brewery as well as micro malting capabilities.

Malting involves steeping, germinating, and drying. Grains are soaked in water and allowed to germinate. The grains are then dried, which kills the young shoots, but makes the grains easier for brewers to use.

Juan Medina Bielski is a malting scientist at the RTC, conducting research and innovative work within the malting process. He says some U.S. brewers have worked with raw Kernza, but there wasn't much available information about malting the grain.



“AURI had an interest in pursuing malting Kernza and getting it into the hands of Minnesota brewers and creating exposure to Minnesota consumers,” Medina Bielski says. “So, we started with looking at the quality and assessing its germination capacity.”

Medina Bielski says there were some handling and processing challenges working with Kernza in part because of its small seed size. However, he was able to conduct several malting trials using the grain. The RTC produced a variety of brews including a hazy IPA.

“It made fantastic hazy beer,” Medina Bielski says. “It had really great flavor and some unique, spicy notes. There was some nice fruitiness to it and the haze was something that really impressed me.”

Medina Bielski also noted that the RTC produced a whiskey using a mix of Kernza and distillers malt. As part of the whiskey trials, data was collected on the malting, mash, fermentation, distillation, and accelerated aging processes.

“We definitely had some good reviews of the qualities that it had,” Medina Bielski recounts. “I would be interested to see someone make a whiskey with the higher color malted Kernza because I think that would produce some phenomenal results.”

“Juan’s done a lot to help us find a sweet spot, for example, on how dark to roast or toast the malt to get its peak flavor, so you’re developing flavor without doing too much,” Ostlund says. “A lot of brewers across the nation so far have been using raw grain, so we wanted to see how we could use it, similar to other malt ingredient formats used for barley or rye, where you malt the grain and then brew or distill with it.”

Sharing Information

Armed with new information on brewing and distilling, AURI is working to share that knowledge with partners in the industry in an effort to increase Kernza’s use in beverages. AURI’s work with Kernza also includes identifying areas where development needs to continue.

“I think the handling challenges are reflected up and down the supply chain,” Medina Bielski contends. “I think there are needs from the combine all the way up to the end user, even for milling and for brewers. But, I think there’s a lot of potential for exploration.”

Ostlund says AURI is focused on helping to resolve gaps that have been identified in the Kernza supply chain.

“We’re looking at the pain points that we hear from commercial pilot partners as they’ve been working with Kernza,” Ostlund says. “There are some kinks along the supply chain, for example, because Kernza is still an emerging crop. Therefore, there will continue to be some inconsistencies in the quality and the grain size as things develop, mature, and get closer to the targets desired by industry. It’s been a lot of reconfiguring and working with groups to see how we can work with the equipment and the machinery that is available to them. That’s been a rewarding part of this process, too, the continued improvements.”

Ongoing Development

The Forever Green Initiative, housed at the University of Minnesota, is a research and innovation platform that has been breeding Kernza. About five years ago, the Forever Green Initiative released a Kernza variety called Minnesota Clearwater, which is extensively grown in Minnesota and other Midwestern states.

“We are focused on trying to breed perennial crops and winter annual crops that have a benefit to soil health, to water quality, and also provide an economic option for farmers in Minnesota and beyond,” says Katharine Chute, product and market development specialist for the Forever Green Initiative.

Chute says her organization is also interested in helping develop opportunities for Kernza in malting and distilling.



“We’ve heard from distillers who have tried a Kernza whiskey that the taste is very distinct, and that they’re able to work with it easily,” Chute says. “I’ve heard also from a number of distillers who are curious about Kernza. Some want to become growers themselves and then have on-farm grain production that contributes to their version of Kernza whiskey.”

Chute says the Forever Green Initiative is working on Kernza breeding initiatives to develop varieties that address some of the handling issues distillers have identified. Efforts include breeding varieties with higher yields, larger seed sizes, and other characteristics that make Kernza easier to grow and manage.

“We’re hopeful that we’ll be able to release our next variety sometime in 2025, which will have improved characteristics on those metrics,” Chute says.

Kernza is gaining traction in the beverage industry, but the combination of agronomic characteristics and potential uses for Kernza make it an intriguing crop for the state’s farmers.

“I think that’s why Kernza is really interesting for Minnesota,” Leiphon contends. “This Minnesota collaboration is a leader in bringing this grain to market right now, and it offers an ingredient that might allow brewers and distillers to differentiate their value-added products with consumers, from both Kernza’s sustainability attributes supporting soil health and regenerative agriculture as well as being a locally grown Minnesota crop.”



AURI Seeds Growth in **Minnesota's Perennial Ryegrass Market**

The far north-central point of Minnesota has produced iconic brands like Marvin® Windows and Doors and Polaris Industries and a generation of talented hockey players. The region is also the second-largest producer of turf grass seed in the United States.

Williams, Minnesota is a small town near the United States/Canada border, located a few miles from the Lake of the Woods. From its facility in Williams, Northern Excellence Seed has served its member growers for more than two decades by providing high-quality conditioning, marketing, and packaging of turf grass seeds, non-GMO soybeans, and other grains.

Perennial ryegrass is the most commonly used turf grass seed in the United States. Northern Excellence Seed cleans the perennial ryegrass seed, packages it, and prepares it for shipment to customers around the world from an 85,000-square-foot facility. The nearby Lake of the Woods, with its wet, cooler nights and cold, snowy winters, creates ideal perennial ryegrass growing conditions.

The Agricultural Utilization Research Institute (AURI) and Northern Excellence Seed have worked together for many years to identify new uses for the agricultural byproducts produced during the cleaning and conditioning of the different grass seeds. In that time, the company has grown and diversified to meet changing market conditions.

The company originated thanks to a generous offer from the Marvin® Windows and Doors family of Warroad, Minnesota. About two decades ago, the Marvin family told a group of area seed growers they were going to close their commercial-grade elevator and seed conditioning plant. They offered the farmers the seed cleaning equipment for free if they built the plant. About a dozen farmers from nearby Northern Farmers Cooperative

Exchange in Williams stepped in to help finance construction of the facility and share resources, labor, vehicles, equipment, and management. Today Northern Excellence Seed is an LLC with more than 50 member growers. In 2004, the plant cleaned about five million pounds of perennial ryegrass seed. This year, or 20 years later, it handled almost 20 million pounds.

The biggest market for perennial ryegrass seed is golf courses in the southern United States. The native Bermuda grass on the courses turns brown and goes dormant in the winter. Overseeding the rough, tee boxes, fairways, and greens with perennial ryegrass seed keeps the golf course looking green and healthy until the spring when the Bermuda grass starts to grow again. Northern Excellence Seed also sells seeds for grass at sports team stadiums and sod farms, and its grass seed mixes are available for purchase at retail centers.

The grass seed market has changed dramatically over the company's 20-year existence. In the early 2000s, growers in the area produced mostly Kentucky Bluegrass and seed for horse hay. The economic recession of 2008 created a three-year backlog of grass seed in the market, and prices dropped significantly as a result.

Today, growers produce perennial ryegrass seed due to changing consumer preferences and the early harvest date for perennial ryegrass compared to Kentucky Bluegrass. The business also expanded and diversified its offerings. In 2016, Northern Excellence Seed added a third processing line dedicated to non-GMO food-grade soybeans and small grains. Those crops are sold to South Korea and Japan for tofu and other food products. The facility also cleans and packages timothy, reed canary grass, and cover crop seeds.

“The recession showed us that it wasn’t easy to have just one product,” says Brent Benike, Northern Excellence Seed’s general manager. “There are also benefits to perennial ryegrass. It is an earlier harvest compared to Kentucky Blue Grass, and the U.S. market shifted to a preference for grasses that do not require as much water and have a deeper root system like ryegrass and fescue.”

Benike says the operations at Northern Excellence Seed will continue to evolve. Demand for grass seed exploded during the COVID-19 pandemic but has started to level off. There have also been changes to how seeds are cleaned and packaged for retail sales. The economy will continue to dictate the market, and the company will respond to customer preferences and evolve.

“We can and we must be nimble,” Benike says. “The one thing for us is that we diversified into more grains and food-related products, and we can do more if we need to. That has been very important.”

Cleaning and conditioning grass seed produces a fibrous material called “coverings.” For many years, Northern Excellence Seed loaded the coverings and trucked them to a disposal site outside of town. This arrangement was not ideal.

“That created all kinds of fire risks with the [coverings] blowing all over, and it was tough on the roads. It was a really big hassle,” says Benike. Several years ago, Northern Excellence Seed approached AURI for assistance finding alternative avenues for the coverings. The two partners explored several options, including using the material in biomass gasification as a form of electrical generation. For the past seven years, the company has sent its coverings to a wood processing plant in Cook,

Minnesota that turns them into a thermal heating supplement pellet in the Iron Range area of northern Minnesota.

“This material is the lowest hanging fruit. There is no value to it whatsoever, so we are very receptive to finding alternative uses and ways for it to be utilized. This has been a fantastic alternative to our problem,” Benike says. “It just shows the value of AURI. I have always looked at the organization as the ligament that connects the bone and the muscle in the ag world here in Minnesota. The state of Minnesota should be proud of putting AURI together all those years ago. It is a model that other states should copy.”

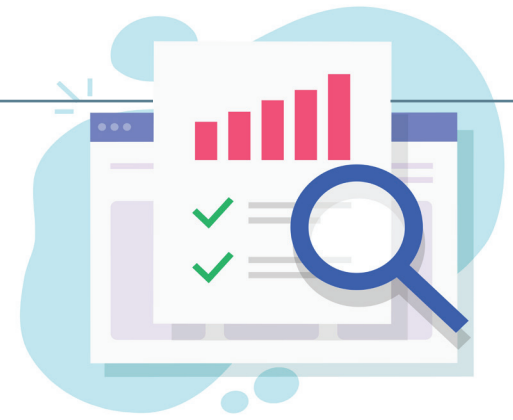
Michael Sparby, AURI’s commercialization director, says that Northern Excellence Seed is an ideal partner for AURI. He says AURI has done BTU analysis for the company as well as valuation and assessment of the biomass product. AURI researchers have also conducted alternative crop testing at the company’s facilities.

“They are amazing partners,” Sparby says. “More importantly, that part of the state is an incredible success story. With the help of the University of Minnesota and the growers themselves, the region has transformed Minnesota into the second largest producer of perennial ryegrass in the nation. It is a testament to the hard work and innovation of everyone involved.”

“AURI is so connected throughout the state and just agriculture in general. They can always refer you to someone,” Benike says. “I tell people all the time that ‘You don’t have to go out and reinvent the wheel. Call AURI because chances are they have already invented the wheel, or they know someone who has.’ They have been a big part of our continued success.”



AURI Publishes Market Spotlights on Emerging Opportunities



The Agricultural Utilization Research Institute (AURI) is publishing a series of market spotlights that examine different food and agriculture opportunities for the state of Minnesota. AURI's market research team compiled each report by speaking with stakeholders, producers, processors, and industry experts and analyzing published data. The reports describe the opportunities, demand, channel, price, and challenges in some familiar and more opaque areas of the state's ag industry.

The project was funded through a grant from the United States Department of Agriculture (USDA) to support technical assistance and market development services for farmers. When the work is completed, there will be a total of 10 market snapshot reports covering goat meat, oats, wool, small dairy processing, specialty oilseed processing, Halal meat, turf seed, compost, artisan grains, and hemp opportunities. Sanchez Philocles, AURI's market research analyst, is leading the research. AURI's in-house staff conversed with technical experts and producers about areas of need and knowledge gaps to decide on the topical areas.

Philocles says about three-quarters of the data compiled was previously published by other sources. The remaining information was obtained through interviews with market experts.

"In many cases, the farmers and the entrepreneurs have a thorough knowledge of their product and process, but they do not have a clear understanding of the larger ecosystem," he says. "AURI can provide assistance through specific market research and synthesized data that addresses the state of the industry and what entrepreneurs can expect. This information helps provide answers about where the individual business owner fits into the larger picture."

To date, AURI has published three of the reports. Philocles says the reports have unearthed interesting findings and he anticipates notable information will continue to emerge as the work progresses.

Goat Market Spotlight

Due to its sizable Somali population, Minnesota is one of the larger marketplaces for goat meat, a staple of the Somali diet. There are about 76,000 regular consumers of goat meat in Minnesota, with an estimated market demand of \$37 million per year. Minnesota farms only produce about 30,000 goats annually, which only serves 17% of the market. Imported frozen goat meat from Australia and New Zealand fills the supply gap. There is strong potential for Minnesota producers to expand production and processing to significantly enhance this home-grown industry. On the demand and processing side, AURI's research identified a small group of businesses that do the majority of processing and facilitate the sale of goat meat.

Businesses should consider some important factors regarding pricing in this market. Goat meat consumption increases during both Muslim and Christian holidays. Producers who anticipate and plan around the holidays can sell their goats at higher prices.

To date, there are no formal marketing strategies helping to connect producers to different buyers in Minnesota. Businesses that will be most successful in turning a profit are the ones that deliver a quality, consistent product and have strong relationships across the industry.

Small-Dairy Processing

Small dairy farms, defined as farms that process less than 750,000 pounds of milk annually, represent about 25% of processing plant customers in Minnesota but less than 2% of milk production in the state. Most small farms sell their milk to dairy processing cooperatives. While consumption per capita of milk has decreased over the past two decades, sales of butter, cheese, ice cream, and yogurt are increasing. To find new revenue streams, many small dairy producers are investing in value-added dairy products like cheese and butter. These producers primarily sell to grocery stores or directly to consumers. Because of cheese's longer shelf-life, producers have more flexible direct-to-consumer options (farmers markets, on-farm stores, and online).

While volume may be less than at retail or wholesale, producers typically receive a higher price for their products when selling direct-to-consumer. Research has shown that consumers shop at direct-to-consumer markets mainly because of food quality, price, and community atmosphere.

Specialty Oilseed Processing

The market for specialty oilseeds, like canola, flaxseed, and sunflower in Minnesota surged over the last decade. According to the market research in the specialty oilseed sector, there is a significant opportunity for growers to produce more specialty oilseeds to meet demand. According to national data, specialty oilseed crops go mostly to processors, representing 58% of the market share, where the products are used for food, livestock feed, and industrial purposes. According to the American Feed Industry Association, roughly 151,000 short tons of canola meal and 2,000 tons of sunflower meal are being used for feed in Minnesota annually. There is potential for camelina production, and Minnesota growers are beginning to explore added production capabilities for this emerging crop.

The market spotlight reports have several implications for Minnesota's ag economy. Philocles says the data shows a mixed bag in terms of overall health among the 10 segments. The turf seed sector, for example, is more secure for producers because of the existing infrastructure and the stability of prices. Others, like wool, face significant growth challenges that will require more concentrated efforts to solve.

"When a potential client or entrepreneur approaches AURI with an issue, the first question we try to ask ourselves is 'What is the actual problem the entrepreneur is trying to solve? What are they asking for help with? Do they understand the market challenges?' Sometimes the answer is not clear. That is why research and data like this is so important," he says. "There is practical, pragmatic information in these reports that helps illustrate the opportunities for value-added investment, understand what the market is saying, and make data-supported decisions."

WHERE ARE THEY NOW?

By Dan Lemke



Mary Hartman didn't plan to start a business, nor did she intend to build an industry, but she's doing both in a span of just seven years.

Hartman started StableFeed, an innovative horse feed and supplement company, by creating some healthful treats for her own horses. The business soon galloped into a whole new arena.

“I started dabbling in things to help my own horse in 2017, but I had no intention of having a business,” Hartman recalls. “I just wanted to create some natural supplements to help my animals, because horses over time are having the same chronic illnesses as humans.”

Hartman says health issues and metabolic diseases are increasing in horses, primarily caused by what they're fed. The supplements she created were quickly shown to improve horse health. Soon other people with horses, including some veterinarians, asked Hartman to make supplements for them. After creating the products in her kitchen for six months, Hartman saw the potential to start a business. In 2017 she registered a business to sell the supplements and StableFeed was born.

Hartman says production really kicked off in 2019. The business moved from her kitchen to her basement, then to a facility in Rochester that it quickly outgrew. StableFeed finally moved to Kasson, where it currently occupies a 3,800-square-foot facility. Hartman also received technical assistance from the Agricultural Utilization Research Institute (AURI) to help formulate and test some of her products.

StableFeed does microbiome testing to assess the horse's gut health and then produces custom prebiotic food and probiotic supplement products that promote better horse health.

“We look to see what is off in a horse's microbiome, then using functional foods and herb extracts that are safe for horses, we create blends to moderate the numbers of different bacteria species in the microbiome to restore balance using food,” Hartman explains.

Hartman researches functional food therapies and individual functional ingredients to help her formulate supplements. The StableFeed supplement line is all chia-based because chia modulates the immune system through high amino acid and high Omega-3 content. She also includes other specific ingredients like spirulina and manuka honey.

“It takes a long time to develop these products and they're all patent protected,” Hartman says. “It's not just a matter of sitting in my kitchen and throwing things into a bowl, it's a little more involved than that.”

BUILDING AN INDUSTRY AND NEW MARKETS

Hartman is also a huge proponent of sainfoin, a perennial legume grown around the world, including in the Western United States. Sainfoin has been widely acclaimed in Europe for its climate-mitigating properties and environmental properties in terms of soil restoration and animal health. StableFeed produces several feed products that contain sainfoin.

“It's non-gas producing so, unlike alfalfa, you can feed it to cattle and they don't bloat,” Hartman says. “It's a natural dewormer, it's a natural E. coli inhibitor, and it's a more digestible protein.”

Hartman is working with growers in Montana and in the Midwest to further establish sainfoin and to create a commercial market for the crop in the United States. Plans are in place for a mill in Montana to provide StableFeed with the processed sainfoin needed for its feed formulations.

Hartman is working with AURI and the University of Minnesota-Morris on a research project feeding sainfoin to dairy cattle. Hartman said sainfoin reduces emissions from cattle because it is non-gas producing and has been shown to increase milk production.

WHERE ARE THEY NOW?

Hartman says the company has sold over \$1 million in products in its brief history. StableFeed works with distributors to get products into tack stores, and they also sell through a large equine based online retailer. Word of mouth from satisfied customers has also been key in promoting company growth.

Hartman hopes to expand again in the next two years because she recognizes the need for more automation to make larger batches more efficiently.

“We're no longer a startup, we're an actual small business,” Hartman says. “We're profitable. We're doubling our sales every year, but we're still running lean because we have to. That's the nature of starting something new, starting an industry.”

In June StableFeed was the grand prize winner of Naturally Minnesota's 2024 Pitch Slam, which celebrates our region's up-and-coming brands.

ABOUT AG INNOVATION NEWS

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AURI launched its “Ag Innovation News” podcast in September 2022 to serve as an extension of the Ag Innovation News biannual newspaper. The podcast is hosted by former AURI Director of Government & Industry Relations Dan Skogen, who engages in conversation with some of the brightest minds and innovative individuals across Minnesota’s value-added agriculture ecosystem.

Each episode explores the topics, ideas, and individuals influencing Minnesota agriculture. If you are curious about value-added agriculture, upcoming events and opportunities along the value chain, or the people who work behind the scenes to strengthen the state’s agriculture ecosystem, this is the podcast for you!

Previous topics include What’s Up with Cold Storage in Minnesota?, Climate Change Opportunities for Value-Added Agriculture, Preventing Food Waste in the Food and Ag Space, and Agricultural Innovation: Soybean Meal Fertilizer. New episodes are published twice a month.

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