



Ag Innovation News

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2018
AG INNOVATOR
OF THE YEAR

A
SUNNY
FUTURE FOR
SMUDE OIL

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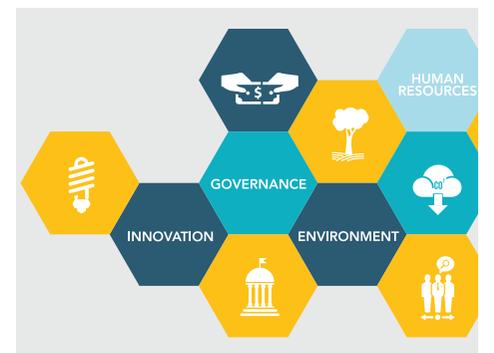
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It's a brand new year!

BY SHANNON SCHLECHT
AURI EXECUTIVE DIRECTOR

Every January, I like to take some time to reflect on the year gone by and the new year to come. AURI had an active 2018 and the year definitely gave me a lot to celebrate, consider and share with you.

Looking Back

Throughout 2018, AURI took a number of meaningful steps to strengthen the organization and provide the highest level of service and resources to clients. During the past year, AURI's staff and Board of Directors undertook efforts to develop the organization's first vision statement. After much discussion revolving around the organization's values, strengths and purpose, the Board decided on: Empowering the commercialization of innovative value-added food and agricultural ideas. This was a significant step because the vision, along with AURI's mission, helps chart a course for the organization into the future.

Another important development, which stemmed from a recommendation made by the Office of the Legislative Auditor, was the implementation of client project fees. In order for AURI to become more self-sustaining, while still encouraging innovation, the organization developed a subsidized and tiered fee-for-service model based on annual sales. This format keeps AURI's services affordable for companies of all sizes, especially for small businesses and startups.

From a funding perspective, 2018 was a successful year. AURI received significant grant support from both the United Soybean Board and the USDA Rural Cooperative Development Grant program. Thanks to their partnerships, AURI was able to support numerous projects to improve the state's agricultural sector as well as its rural communities.

Last, in looking back over the year gone by, I am pleased to see the progress made in our Innovation Networks Program, public educational initiatives, and our commercialization services. These program areas made significant impacts on the food and ag innovation ecosystem by helping clients and stakeholders widen their networks, ensuring awareness of opportunity areas and by bringing new innovations to the market.

Looking Forward

Looking forward to 2019, I see a lot of things to get excited about! First, I believe AURI will continue to increase its collaborative partnerships throughout the food, coproducts, biobased and renewable energy industries as Minnesota's innovation ecosystem grows and evolves.

In addition, I believe the year to come offers significant opportunity for AURI to further innovate and support Minnesota's value-added agriculture sector. In the next 12 months, AURI will host its third new uses forum, focusing in part on rural investment opportunities. We will also help lead an open innovation program in partnership with a number of other Minnesota-based organizations to accelerate the commercialization of research ideas that can solve industry challenges.

In closing, I want to extend my sincerest thanks to all of AURI's partner organizations, clients, supporters and staff for making 2018 such a great year. I especially want to thank the Minnesota legislature for its continued strong partnership with AURI to foster new business opportunities that benefit the agricultural community. I look forward to making 2019 AURI's best year yet.

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EMPOWERING THE
COMMERCIALIZATION
OF INNOVATIVE
VALUE-ADDED FOOD
AND AGRICULTURAL
IDEAS.

”



BY AURI

This quarter, Ag Innovation News is highlighting Larry Johnson. When we last spoke to Johnson in April of 2017, he was just getting settled into his new role as a Director. This time around we will delve into what he's learned from his experiences so far and the role he plays on AURI's Board of Directors.

AIN

What opportunities do you see for AURI?

It's still early in the development of technology for modifying yeast and enzyme capabilities to create new products from our food and fiber, but changes and innovations are fast approaching. New processes will enable the production of better, cleaner, and more efficient industrial and consumer products.

LJ

AIN

What are some of the more exciting developments you've seen?

Certainly one of the most successful is Smude's Sunflower Oil, founded by Tom and Jenni Smude of Pierz, MN. They evolved from raising sunflowers as a crop diversification idea into processing the seeds into dipping and cooking oils as well as oil for clean label microwave popcorn. Now they're AURI's Ag Innovator of the Year for 2018!

LJ

Also, AURI participated with Food Ag Ideas week in October and along with the Larta Institute and MyFormulary, sponsored a forum titled "The Nexus of Food & Health." This event brought together an amazing group of experts and businesses featuring the role that food can play in our health and well-being. New knowledge and innovation in food products are emerging as enjoyable and effective replacements for expensive medications and health care.

There are also many creative individuals and startup companies developing new and unique food products. Products such as functional foods, ethnic foods, specialty proteins, energy bars, honey products, plant-based yogurts as well as craft brewers and distilleries. Many of these entities come to AURI for its expertise as they advance from their kitchen to commercial production.

AIN

Can you share any recent innovations in other areas of AURI's work (i.e. coproducts, bio-based products, renewable energy)?

AURI is involved with a variety of industrial hemp farmers and supporters as hemp acreage is increasing and attracting interest in its potential for food, oil, fiber and industrial uses. If the latest Farm Bill retains its current language legalizing industrial hemp as a farm crop, both production and usage are expected to increase rapidly.

LJ

AIN

Ethanol is often considered one of the original "value-added products," what is its current impact on the value added ag sector?

Ethanol production is certainly a historic benchmark in our agricultural history. Not only did it increase the price of corn but it encouraged tens of thousands of farmers to invest in value added processing and receive annual dividends. Because ethanol production is a relatively simple first step into value-added processing, it has provided the foundation for new technologies and processes. Ethanol plants are now producing new feed and food products, not only from starch and sugars but also from the cellulosic parts of the crop that previously had little or no value.

LJ

AIN

You've now been a board member for two years—what are some of the highlights from your time on the board?

I have been very surprised by the volume of clients and requests for assistance that come in to AURI. So a highlight would be just the amount and variety of projects we see and the capabilities of the AURI staff to assist them. We have also completed the first two "New Uses Forums" in 2017 and 2018 that have been very successful. The theme of this past forum was "Adding Value at the Speed of Innovation" which describes the accelerating pace at which technology is increasing the value of our agricultural production. It is exciting to see the innovation that entrepreneurs are bringing to food, feed, energy and new consumer products.

LJ

AIN

During the next year, do you have any goals you hope to achieve?

My personal goal is to provide AURI with the best support and decisions possible to help maximize its impact on Minnesota agriculture. It is a two-way street, as I am able to assist AURI with my experience, knowledge and contacts from years in the ethanol industry and AURI keeps me current with some of the latest technology in agricultural processing and new products. There are also great strides to be made in the development of new protein sources for both animal feed and human nutrition to supply the growing worldwide demand. These are both goals and challenges. It is certainly exciting, and I feel it's a great opportunity just to be a part of it.

LJ



2019 RESEARCH THEMES

Within the vast world of value-added agriculture, it is important for an organization like AURI to keep efforts focused and true-to-mission year-after-year. One of the central methods AURI uses to accomplish this is by identifying key research themes and priorities to guide its efforts.

These research themes represent the focus of the organization's work and are based on emerging opportunities with the potential for impactful outcomes. Specifically, the research themes communicate research and activities to partners, supporters and other important stakeholder groups that will be useful as AURI assesses funding and collaboration opportunities.

To that end, AURI identified a number of broad-based themes based on industry trends, potential for commercial development, opportunities to fill gaps in knowledge, challenges faced by various industries and opportunities for synergy and collaborations. Above all, the purpose of AURI's research themes is to explore value-added innovation areas with the most potential to positively impact the state of Minnesota and the greater agriculture industry.

For 2019 AURI categorized the research priorities into three broad, but distinct groups: Coproducts/Biobased/Renewables, Multi-Disciplinary and Food.

"By working within these areas, AURI staff can garner information and educate our clients and partners about viable opportunities to invest in ways to deliver mission relevant impacts," said Jennifer Wagner-Lahr, senior director of innovation & commercialization. "This fosters collaborative efforts that benefit the agricultural industry in Minnesota and bring ideas to reality."



COPRODUCTS/BIOBASED/RENEWABLES

Within the framework of this theme, AURI works to identify value-added applications for both primary agricultural commodities and coproducts. Opportunities like these arise through a formal examination process involving applied research, technical assessment and public outreach.

By working to develop these opportunities, AURI creates a multi-tiered positive impact. The successful pursuit of these themes often result in new innovations benefitting producers, processors and end users. The result can range from the creation of new business opportunities and jobs to capital investment in rural communities. Both of which benefit the local and state economy, and by extension can have a ripple effect into bordering states.

AURI will explore key research themes within the coproducts and biobased/renewables domain, including: *Industrial Applications of Biobased Products*; *Innovative Utilization of Minnesota Coproducts in Ag Production*; and *Monetizing and Mitigating Ag and Processing Waste Streams*.

Industrial Applications of Biobased Products

This theme focuses on the development of new, innovative biobased alternatives to traditional petroleum-based products. Through its work in this area AURI endeavors to help create new markets, domestically and internationally for Minnesota commodities, which means a higher potential for producer-profitability.

In the coming year, work conducted within this theme will focus on biobased road sealants, biodegradables, extractables, high value molecules and biocomposites. In addition to exploring the efficacy of these elements, this theme investigates the cost-benefit of using biobased solutions as an alternative to traditional materials. In the end, this combination of exploration and development of industrial applications increases the potential to yield new economic activity and utilization of Minnesota commodities.

Innovative Utilization of Minnesota Coproducts

AURI's *Innovative Utilization of Minnesota Coproducts* research theme works to characterize coproducts and identify innovative applications with higher value potential. This innovative utilization comes in many forms, ranging from the implementation of a new technology that makes a process more efficient to identifying new uses or applications for specific coproducts.

Throughout 2019, the AURI team assigned to this theme will look into potential coproduct use in feed and feed supplements, livestock bedding, organic fertilizers and various forms of soil amendments. The result of this work has the potential to benefit Minnesota's agricultural processing industries and grower groups by developing new products, which translates into additional revenue streams.

It's important to note this exploratory work is not singularly client-specific. Rather, it addresses both client needs as well as processing or value-added coproduct applications that potentially benefit the agricultural industry at large.

Monetizing and Mitigating Ag and Processing Waste Streams

AURI's research theme *Monetizing and Mitigating Ag and Processing Waste Streams* has significant impact potential, not only to Minnesota but to the greater agricultural industry, because processing waste at any level of the value chain can be a significant expense. To address this issue, the research theme focuses on conducting analyses and value identification of these streams. In doing so, AURI researchers explore creative solutions by investigating new methods of mitigating repurposing costs or adding value to these streams via new product development.

AURI utilizes a formal process to achieve these goals. First, researchers identify waste streams and their characteristics in order to conceive ideas for new products with a focus on hurdles that must be overcome. Next, they identify technologies or processes capable of overcoming those hurdles. Then researchers validate the technology or processing within AURI pilot lab facilities.

This theme will focus on two broad categories of analysis and value identification, coproducts and food waste mitigation.

"This theme represents three AURI focus areas and is a very broad category encompassing a wide range of analysis and work. Selecting research themes helps focus resources for outcomes where we feel opportunities best exist," said Shannon Schlecht, AURI's executive director. "These research themes provide an avenue to better tell the story of both what is happening in this space and what is underway to drive change in these areas as well as to illustrate potential areas of industry collaboration."



FOOD

Today's consumer market is a major driving force for innovations in the food industry. With a constant wave of demand for new products, product differentiation and formulation changes staying on top of this continuously evolving landscape to meet consumers' needs and realize commercialization success is difficult. That's why AURI chose to focus its 2019 food research on themes that address these challenges and help advance solutions for food businesses to thrive.

The key food research themes AURI selected to explore include: *The Nexus of Food, Health and Wellness*; *Exploring Traditional and Alternative Protein Sources*; and, *Creating an Environment For Scalable Food Businesses*.

The Nexus of Food, Health and Wellness

Increasingly, today's consumers are taking charge of their personal wellbeing through their food choices. AURI's research theme *The Nexus of Food, Health and Wellness* explores this movement, as well as opportunity areas for businesses and industry to pursue. To move this theme forward, researchers will explore elements that play a role in the ongoing market shift. This includes the ubiquity of data, the evolution in personalized medicine and insights from research into foods' interactions with our overall health and well-being.

In exploring the various aspects of this theme, AURI staff can assist food businesses and entrepreneurs in developing a new product that meets consumer demand or reformulating a product to better position it in this nexus space of food, health and wellness. This theme has great potential for positively impacting Minnesota because the state has established itself as a center of food and medical innovation.

Throughout the year, AURI will focus its efforts for this theme on topics related to high oleic oils, functional foods and clean labels.

Exploring Traditional and Alternative Protein Sources

Because protein ingredients continue to gain prominence due to escalating consumer awareness and demand, AURI determined one of its themes should focus on exploring the topic. Within this framework, AURI will explore new opportunities for traditional sources of protein, like meat, dairy, and nuts, as well as the development of new sources and products from novel plant proteins and cellular agriculture. The ultimate goal of this theme is to identify opportunities for clients and the industry at large to meet consumer demand and develop new products.

Work within this theme provides direct support to small- and medium-sized Minnesota meat-based businesses (both traditional and boutique), as well as alternative protein-based businesses that make products like snacks, spreads and beverages from non-traditional protein sources. In some cases, there are also opportunities for the two groups to work together on products that contain both traditional and non-traditional protein sources.

During the lifespan of this research theme, AURI staff will focus their efforts on convening events that further protein innovation in all arenas, the Protein Highway program, and studies in plant protein sources for new uses in food products.

An Environment For Scalable Food Businesses

AURI is committed to helping build a Minnesota-wide food innovation ecosystem. Its *Creating An Environment For Scalable Food Business* research theme advances this commitment by providing affordable and accessible food safety, regulatory compliance, and product development services. These efforts deconstruct barriers and create building blocks for food companies through sound science and an expanding list of capabilities.

Up to this point, numerous AURI initiatives exemplified this commitment. For example, AURI is partnering with the Minnesota Department of Agriculture to undertake a multi-phase public initiative exploring the lack of capacity and access to affordable manufacturing options in Minnesota for ready-to-scale food and beverage businesses. The initiative identifies strategies to encourage development of a more robust manufacturing infrastructure.

Moving forward, AURI will focus its efforts within this theme on empowering small-scale entrepreneurs, furthering its pricing guide offering, implementing a sensory lab and exploring co-manufacturing feasibility.

"The food industry is very dynamic and competitive. AURI's research themes equip food entrepreneurs with knowledge to make sound business decisions and strategies for the future," said Schlecht. "Exploratory work produces information that helps entrepreneurs and producers overcome early challenges to successfully bring their products to market as well as outline the resources available to develop a longer-term strategy."



MULTI-DISCIPLINARY

Research and pilot programs are underway across the state to develop new crops and cropping systems for Minnesota producers. Developing the value-add opportunities in parallel with the agronomics research is a critical factor to the early success and adoption of new crops. The goal of AURI's value-add efforts in this theme is to overcome potential constraints and help accelerate the economic pull of these crops into the market place to provide producers economically viable cropping choices for their operations.

Developing Minnesota's Industrial Hemp Production and Processing Industry

Minnesota currently operates a pilot program, which is part of the 2014 U.S. Farm Bill, allowing for the study of growth, cultivation, and marketing of industrial hemp. AURI's research theme *Developing Minnesota's Industrial Hemp Production and Process Industry* explores this opportunity with specific focus given to value chain opportunities. Analysis and study is paramount to position Minnesota for long-term economic success using industrial hemp.

For this theme, AURI researchers will investigate the use of hemp in biobased products, as well as the potential use of its meal, oil and fiber for both the livestock feed and food ingredients. To this end, AURI will release a public domain report in 2019 illustrating the value chain segments, developed with information obtained through several interviews with key leaders and stakeholders in the hemp industry.

Preserving Soil Health With Cover Crops and Perennials

AURI's research theme *Preserving Soil Health Through Cover Crops and Perennials* aims to identify value-added markets and products for new cover crops and perennials. Through a collaboration with the U of M, AURI will focus on research and development of valued-added processing and product development of new or existing plants, such as: Kernza, pennycress, camelina, etc. The goal is to demonstrate potential profitability and market acceptance for producers adopting these new crops.

AURI will support this research theme in a variety of ways including: working to identify the value chain opportunities; assisting in the development of pilot labs focusing on drying and/or material cleaning and handling requirements; conducting research and development of new products that can be manufactured or produced from various cover crops or components of the materials that can be incorporated into current markets; and helping to move products into the marketplace as human food or livestock feed.



FUTURE ENDEAVORS

Achieving AURI's mission to foster long-term economic benefit for Minnesota through value-added agricultural products requires constant analysis and innovation. Ongoing work of the outlined research themes accomplishes this and ensures AURI progresses and continues to fulfill its mission of fostering long-term economic benefit for Minnesota through value-added agricultural products. Future efforts rely on critical insights and a deepened base of knowledge obtained through this critical applied research.

"AURI generates positive effects for the agricultural community through its experience and first-hand knowledge of what drives change in the industry. The teams at AURI are passionate in their efforts to explore these research themes to further opportunities for the agricultural industry that match our organization's mission," said Schlecht. "The AURI community and stakeholders have plenty to look forward to in the coming year!"

FOCUSING ON THE YEAR AHEAD



A SUNNY FUTURE FOR SMUDE OIL

PIERZ COMPANY CHOSEN
FOR ANNUAL AURI AWARD



Smude's expansion is not only good news for the company and the Pierz community, it's also providing an opportunity for other local farmers. Smude expects to contract between 800 and 1,000 acres of sunflower production in 2019. The following year he estimates they will need 6,000 acres of production, and 10,000 to 15,000 acres by 2021.

BY DAN LEMKE

The path to commercial success is rarely linear. Instead, it's often chock full of twists, turns and unexpected challenges, something to which Tom and Jenni Smude can likely attest. The Smudes, who own Smude Enterprises, makers of Smude's Sunflower Oil, have turned necessity into a thriving business that is being recognized as AURI's 2018 Ag Innovator of the Year.

The Smudes operate a crop and cattle farm near Pierz, Minnesota. A drought in the late 2000's forced them to look for an alternative protein source for their cattle feed. Trucking in corn and soybean meal was expensive. The Smudes also wanted a crop that could perform well in the region's sandy soils.

"We looked at the trucking costs for bringing protein in and thought 'why not make it ourselves,'" Tom Smude says.

THE ANSWER CAME IN SUNFLOWERS

Fluid Plans

The Smudes began processing sunflowers to get the meal for their cattle and planned to sell the oil into the biofuels industry. Soon after they began processing, the price for oil dropped.

"The long-range plan was to bottle and sell the oil," Smude says. "Instead of doing it in three to five years, we were at it in a matter of months."

The Smudes raise and process high-oleic sunflowers. The seeds are higher in unsaturated and polyunsaturated fats and vitamin E than typical sunflower varieties. Those heart-healthy traits are desirable for baking, cooking and as food ingredients. The Smudes shifted gears and began bottling and selling food-grade oil through retail outlets.

"My mom and a friend went to the farmers market in Onamia and came back with \$77," Smude recalls. "Then I went to one in Isle on a Saturday and came back with about \$400. That's when I thought this might work."

Because they utilize a cold press process that uses no chemicals, the all-natural oil became a hit. Smude's Premium Sunflower Oil, including flavored and infused oils, can now be found at hundreds of retail locations across the Midwest and can be purchased from their website.

"Their products are spot on with consumer trends," says Jennifer Wagner-Lahr, AURI Senior Director of Innovation and Commercialization. "They produce what many consumers are asking for and they're about as close as you can get to getting it directly from the field."

Opportunity Pops

Several years ago, Smude's added microwave popcorn to their product offering. Their oil is already used to pop popcorn by some movie chains. Adding their own product line was a natural progression.

"Most microwave popcorn on the market has a lot of different ingredients that are difficult to pronounce," Wagner-Lahr says. "The Smudes use popcorn, sunflower oil and salt. That clean label matches what consumers want."

While it may be what consumers want, coming up with packaging that could contain the liquid sunflower oil without leaking was a challenge. Eventually the Smude's discovered a highly refined paper that could hold in the oil for up to a year and a half without the need for wax, chemicals or preservatives. That opened the door for Smude's microwave snack.

"I feel like all we've done for the last eight years was the footprint to start the popcorn business," Smude says.

Business Expansion

The Smudes began their operation on their 160-acre farm, but quickly out grew the production space and moved it into Pierz. To meet the growing demand for their high oleic sunflower oil and popcorn, Smude Enterprises recently acquired a facility near their existing location and are working to expand the oil production.

The new Pierz plant will help the Smudes grow from producing about 800,000 pounds of oil per year to 6 million pounds annually. The expansion includes three presses, but the facility will be built to accommodate up to 10 presses. The Smudes currently have 23 employees working for them but expect to grow that number to 33 in the next year.

In addition to the bottled oil and popcorn, Smude says the bulk oil they produce will be used in the pet food market.

Smude's expansion is not only good news for the company and the Pierz community, it's also providing an opportunity for other local farmers. Smude expects to contract between 800 and 1,000 acres of sunflower production in 2019. The following year he estimates they will need 6,000 acres of production, and 10,000 to 15,000 acres by 2021. For now, some of that production will have to occur outside of Minnesota.

"It's hard to find enough acres locally, so we'll have farmers from other states growing for us. Within the next year we'll try to get more local acres because our products are Minnesota made and we want them to be Minnesota grown," Smude adds.



Smude's P purchased



Innovation Runs Deep

In addition to Smude Oil, the Smude's also own and operate a grain handling equipment business and recently acquired Rich Prairie Custom Woods. Sawdust from that operation will be mixed with dust and hulls from the sunflower seed cleaning process to heat the processing facility.

Smude says the company is looking at new sunflower seed varieties and new oils to enhance their products and open new opportunities. The future could include providing ingredients for skin care, makeup and cosmetics.

"We're always looking for the next thing," Smude says. "We look at what's not on the shelf and think, let's do that."

THEY ARE THE EPITOME OF A HOME-GROWN, VALUE-ADDED BUSINESS

AURI has worked with the Smudes on multiple projects including nutrition labeling for their products, shelf-life testing and technical assistance on product development. The Smudes focus on innovation, commercial success and product utilization made them a clear choice to receive AURI's annual Ag Innovator of the Year award.

"They're the poster child of innovation," Michael Sparby, AURI senior project strategist contends. "They've identified new markets for the oil and meal coproducts. They're continuing to innovate and they're doing that by identifying and growing new markets where they can differentiate themselves. They're doing this even though they're already thriving."

"Ten years ago, the Smudes were your everyday farm growing crops and livestock, facing adversity and challenges, but also innovative enough to know that opportunities arise out of challenges," says AURI Executive Director Shannon Schlecht. "That vision started with trying a new crop, to marketing a new crop, to cold pressing seeds for oils, to creating new oil flavors, to creating a secondary tier of products that use the oil such as microwave popcorn. The fortitude to move into a new area in adverse times, then to work hard, foster the ingenuity, and take a can-do attitude in their journey, truly raises them up as a success story in the vibrant Minnesota food and agriculture innovation arena."

The Smude's road to success has included a steep learning curve and plenty of risk. It's also taken a leap of faith as both Tom and Jenni Smude quit full-time jobs along the way to run the growing business.

"My wife can see the future now," Smude admits. "At first, I think she thought I was crazy, but she sees the potential now."

To learn more about the Smudes or their products, visit www.smudeoil.com.



Premium Sunflower Oil, including flavored and infused oils, can now be found at hundreds of retail locations across the Midwest and can be found from their website.

Recognizing Minnesota Innovators



For the past 16 years, AURI has recognized Minnesota companies that utilize Minnesota-grown agricultural products, have utilized AURI programs and assistance, have an innovative product or process and have achieved commercial success through the Ag Innovator of the Year award. Smude Enterprises of Pierz joins a decorated list of innovative companies who have received the award.

"They are true innovators and have seen success over a roughly 10-year period," says AURI Executive Director Shannon Schlecht. "The difficult farm and price environment Minnesota agriculture faces today is reminiscent of the Smude's start, and is a great inspiration in how an idea, and the embracing of innovation, can create an alternative reality."

"They're farmers who took a big risk and it's paying off," adds AURI Senior Director of Innovation and Commercialization Jennifer Wagner-Lahr.

Wagner-Lahr says the Smude products match what consumers want, including healthier products with clean labels.

"I didn't expect the award," Tom Smude says. "There are a lot of other companies out there that are deserving."

The Smudes are frequent presenters at events where their story resonates with other entrepreneurial companies and consumers alike.

"They're very well received when they speak," Wagner-Lahr says. "People are impressed with their products and their plans."

"AURI does things for us and we do things for them," Smude says. "We have a good relationship."

While there is never a bad time for innovation, Schlecht says with depressed commodity prices and trade issues facing the state's farmers, value-added enterprises are as necessary as ever.

"This is the right time to be thinking about value-added agriculture and how it can match up with local and regional market opportunities," Schlecht says. "Challenges create opportunities and I'd love to see more producers take the Smude approach and explore a value-added idea with AURI."



Got Biomass?

Midwest Biomass Exchange Goes Online



www.mbioex.com

BY AURI

Are you seeking outlets for selling agricultural residues this year? Check out the updated Midwest Biomass Exchange website at www.mbioex.com – a free internet marketplace designed to connect buyers and sellers of woody and agricultural biomass. Users can place “For Sale” and “Wanted” ads for biomass that can be used as fuel for heating and power generation, or as feedstock for other manufacturing processes.

Updated from the former Minneapolis Biomass Exchange, the new site focuses more closely on biomass for fuel, and on serving the Midwestern area in the U.S. and Canada. MBIOEX is one of the most user-friendly web-based marketplaces for woody and agricultural biomass buyers and sellers. It includes a map showing approximate locations of buyers and sellers, and an email utility for registered users to contact other users about listings without giving out their work or personal email address.

“We hope that MBIOEX will help buyers and sellers connect via the website, increase the visibility of biomass fuel suppliers, and enhance the availability of information about potential sources of woody- and agricultural biomass,” said David Neumann, forest utilization and marketing specialist for the Michigan Department of Natural Resources. “We hope the site helps individual companies that are seeking fuel sources make connections with sellers, and that the site helps those that are considering biomass-fired heat or energy systems better understand the network of fuel providers in their area.”

While other web-based marketplaces do exist, they typically have few listings within North America and users must sift through all manner of items. All of MBIOEX’s listings, however, are for buyers and sellers located in North America, and it offers a simple, easy-to-use interface for searching listings. Also, the new site focuses solely on woody and agricultural biomass that can be used for fuel.

“Supporting the Midwest Biomass Exchange was a natural fit for us,” said Chuck Gagner, President of Heating the Midwest. “Our core values and beliefs are the same – we strive to increase awareness and usage of renewable biomass and thermal energy. Heating the Midwest is committed to continuing to enhance the functionality of the MBIOEX site to attract a broad user base across the biomass industry, and to ultimately establish it as a premier marketplace for buying and selling biomass.”

HTM plans to continue to enhance MBIOEX to improve the user’s experience and the value users derive from it. “The site helps buyers and sellers of biomass make connections and facilitates sales of woody and agricultural fuel,” says Neumann. “We’ll continue making upgrades that will make it easier, quicker to find listings, and clarify what kind of biomass it is, and what it can be used for.”

For Sale			Wanted		
Item	Quantity	Location	Item	Quantity	Location
Other	10 Truckloads or Partial	USA	Sawdust - clean	100 Tons/Week	Hurley, Wisconsin, USA
Shavings	1,000 Truckloads	Tularosa, New Mexico, USA	Corn Cobs	5,000 tons	Clarks, Nebraska, USA
Sawdust - clean	2,000 tons	South Branch, Michigan, USA	Sawdust - clean	100 tons per wk	New Richmond, Wisconsin, USA
Railroad ties	2,000 Each	California, USA	Industrial Pellets	10,000 Ton	USA

Future enhancements will also include behind-the-scenes upgrades, improving HTM’s ability to report website usage, volume and value of biomass sales facilitated, and types of biomass sold. “We’d like to improve our ability to tell current and prospective users how the site is used, and what the impact or value-proposition to potential new users is,” says Neumann.

Another long-term goal for the project will be to seek financial support from the industry to fund routine annual maintenance and support for website upgrades. “We would like to recruit four or five sponsors to contribute about \$500 per year to support the site,” says Neumann. “We plan to explore ways to recognize sponsors without impairing site usability.”

Website revisions were supported by funds from the USDA Forest Service Forest Products Marketing Unit, and by partners including Heating the Midwest, the Agricultural Utilization Research Institute, the Michigan DNR, the Wisconsin Department of Natural Resources, and the Minnesota Department of Natural Resources. For more information about the site, see www.mbioex.com or contact Dave Neumann at neumannnd@michigan.gov.

“The site helps buyers and sellers of biomass make connections and facilitates sales of woody and agricultural fuel”

David Neumann, forest utilization and marketing specialist for the Michigan Department of Natural Resources



BY AURI

One of the most common questions entrepreneurs and small business owners ask themselves is “how can I increase my sales?” The obvious answer for most is to grow the customer base, but that can only get a business so far. For most, the better solution is to increase the volume of units sold across all customers.

Obviously, this is something which is easier said than done. However, thanks to programs at both the state and federal levels, there are some new opportunities for businesses in the value-added sector. The first is related to sustainable purchasing practices, while the other is a voluntary labeling initiative; both of which have the potential to increase the volume of products sold in unique ways.

Minnesota’s Sustainable Purchasing Program

At the state government level, Minnesota has committed to a Sustainable Procurement Program, which endeavors to make greener, cleaner and sustainable purchasing decisions, with the end result being a strong, equitable local economy, and improved operational efficiencies across the enterprise. To that end, Minnesota is using its purchasing power to help drive the market for sustainable goods and services by making purchases that demonstrate the highest level of environmental, social, and economic responsibility.

Minnesota is taking this commitment very seriously. In fact, an executive order was put forth in 2017 by then-Governor Mark Dayton, which said, in part, “strengthening sustainability in state operations leads to better government and smart stewardship of taxpayer dollars. Minnesotans deserve continual improvements to government operations, including sustainability improvements that will help save taxpayer dollars through avoided costs, increased efficiencies, and more resilient facilities and operations, along with enhanced environmental and health protection and job creation.”

This program has significant potential for business owners because Governor Dayton set a goal of 25 percent of the total spend on priority Contracts are sustainable purchases by 2025. This translates into millions of dollars of potential revenue for companies who offer sustainable goods and services, like biobased products that can replace traditional petroleum-based products. For example, in Minnesota today there are more than 100 soy-based products that qualify for sustainable purchasing, with additional innovations developed every year.

To learn more about becoming a new sustainable product provider for the state, visit the Minnesota State Procurement website at: www.mmd.admin.state.mn.us/mn02000.htm.

The two major parts of the program are the mandatory purchasing requirements for federal agencies and their contractors, and a voluntary labeling initiative for biobased products.

Federal law, the Federal Acquisition Regulation, and Presidential Executive Orders direct that all federal agencies purchase biobased products in 109 categories (e.g. cleaners, carpet, lubricants, paints) identified by USDA.

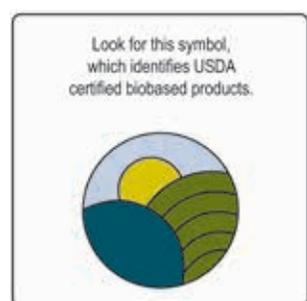
The Voluntary Biobased Labeling Initiative is designed to increase awareness of the existence and importance of biobased products. In addition, certified products are listed in the BioPreferred Catalog, providing a marketing avenue to inform consumers.

A business with a biobased product that meets USDA criteria may apply for certification, allowing it to display the USDA Certified Biobased Product label. This label assures a consumer that the product contains a verified amount of renewable biological ingredients. Consumers can trust the label to mean what it says because manufacturer’s claims concerning the biobased content are third-party certified and strictly monitored by USDA.

As you can see, companies participating in this program can benefit greatly in both exposure to new customers as well as product differentiation. In receiving the federal certification, companies can add the BioPreferred label to their packaging, which sets the product apart from competitors who are not, or cannot, be certified. This is a big advantage when competing for shelf space in markets, especially when many stores and distribution hubs are purposefully looking for products that are more sustainable.

Also, participation in this federal program comes with a free listing in a BioPreferred Catalog. This, in combination with the certification label can help government purchasers locate biobased products for which they have mandatory purchasing requirements. In essence, this can both increase the number of potential customers and, because the federal government purchases in high quantities, increase the total volume of units sold from year to year.

To learn more about this program, receive certification and be included in the BioPreferred catalog, visit: www.biopreferred.gov.



USDA’s BioPreferred Program

On the federal level, the U.S. Department of Agriculture (USDA), launched a BioPreferred program with the goal of increasing the purchase and use of biobased products. Created by the 2002 Farm Bill and reauthorized and expanded as part of the Agricultural Act of 2014, the program’s purpose is to spur economic development, create new jobs and provide new markets for farm commodities.

How AURI Can Help

If you have a product or innovative idea that could benefit from one of these programs, but need assistance, AURI can help. AURI can help clients access these programs and guide them through the process via product and business development. In addition, AURI can connect you to programs and buyers looking to purchase sustainable and biobased products. Last, it can also assist with accessing a pilot lab, product formulation, labeling, scale-up or commercialization. Additionally, AURI can help your organization move along the value chain by offering referrals, feasibility study assistance and more. These services and resources are available to companies of all sizes in the areas of food, biobased products, renewable energy and coproducts. To learn more about AURI’s services and resources, visit us at auri.org.



SOME OF THE PREVIOUS AG INNOVATOR OF THE YEAR RECIPIENTS



PET CARE SYSTEMS

Producer of Sweat Scoop wheat-based cat litter.



SUNTAVA

All-natural colorants from unique purple corn



PROTEIN RESOURCES

Novel soybean meal for alternative feed markets



MINNESOTA SOYBEAN PROCESSORS

Biodiesel production refinery based in Brewster



NORTH AMERICAN FERTILIZER

Fertilizer production from ag processing coproducts



KAY'S NATURALS

Heart healthy snack producer



NORTHERN EXCELLENCE SEED

Alternative energy production from ag processing coproducts



BIO-PLASTIC SOLUTIONS: INNOVATIVE

Ag-based plastics for commercial application

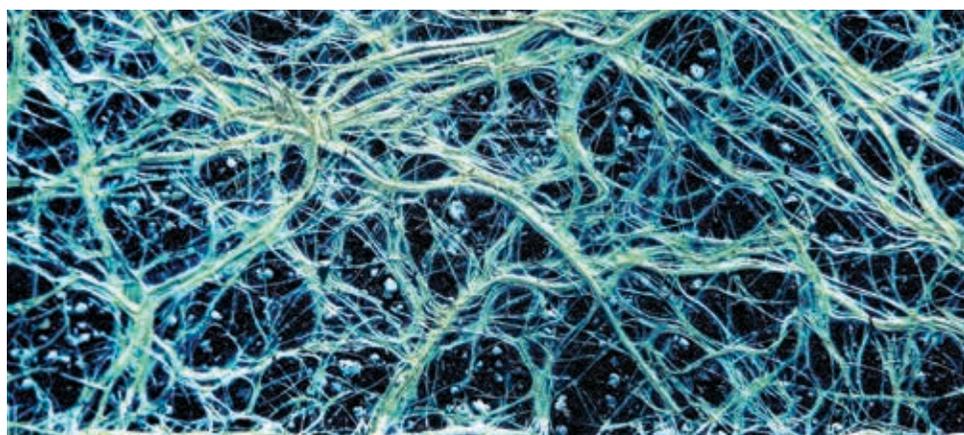


CHIPPEWA VALLEY ETHANOL COMPANY

Value-added uses for corn and ethanol production coproducts

ELSEWHERE IN AG INNOVATIONS

BY AURI Editor's note: As a service to our readers, we provide news about the work of others in ag utilization. Often, research done elsewhere complements AURI's work.



Gene network enables plant roots take up and metabolize nitrogen

Researchers at the University of California, Davis and Cold Spring Harbor Laboratory are unraveling how plant roots take up and metabolize nitrogen. Nitrogen fertilizers have enabled a massive expansion in agricultural productivity to feed billions of people. At the same time, nitrogen runoff has an environmental impact. Researchers aimed to discover the networks of genes that shape how plant roots live and grow so they could understand the ways that nitrogen metabolism is regulated. Very few regulatory genes, called transcription factors, have been identified in roots, where nitrogen actually gets into a plant from the soil. Researchers used robotics to screen transcription factors against hundreds of genes, while assembling them into a network. Then, they used computational methods to predict which genes were most important in the network. The team could then study the role of those genes in plants. The results establish a set of genes that are critical in nitrogen metabolism. The impact of this could mean providing plant breeders tools to generate crop varieties that need less fertilizer or make better use of it.

Science Daily, October 24, 2018



Potato waste may lead to enhanced food waste conversion

Researchers in Penn State's College of Agricultural Sciences recently developed a novel approach to efficiently convert potato waste into ethanol. Researchers simultaneously triggered saccharification – the process of breaking down the complex carbohydrate starch into simple sugars – and fermentation. The addition to the bioreactor of mold and yeast catalyzed the conversion of potato waste to bioethanol. Moreover, the bioreactor had plastic composite supports to encourage and enhance biofilm formation and increase the microbial population. The results of this study are very promising as the co-culture biofilm reactor provided similar ethanol production compared to conventional ethanol production. Industrial food waste has the potential to be a great substance in the production of value-added products to reduce costs, while handling the waste in an environmentally conscious way. More efficient bioethanol production is essential to meet the demand for renewable energy and reduce the negative environmental impacts of petroleum fuel.

Science Daily, August 17, 2017

AURI'S FOCUS AREAS QUIZ

How much do you know about AURI's focus areas: food, renewable energy, coproducts, and biobased products? Take the below quiz.

Food Products

What fatty acid contributed to the start of the clean label trend back in the 1990s and the consumer awareness of highly processed ingredients in the food supply?

- a. Trans fatty acids
- b. Saturated fatty acids
- c. High fructose corn syrup
- d. All of the above

Answer: a

Renewable Energy

Biomass pellets are useful in the production of heat.

- a. True
- b. False

Answer: a

Coproducts

Which of the following forms of agricultural waste can convert into ethanol?

- a. Corn
- b. Potato
- c. Sugar beets
- d. A, B and C

Answer: d

Biobased Products

The U.S. Department of Agriculture estimates there are BLANK products, made with biobased ingredients, on the market today.

- a. 20,000
- b. 1 million
- c. 45,000
- d. More than 1 million

Answer: a

ABOUT AURI

The Agricultural Utilization Research Institute (AURI) helps develop new uses for agricultural products through science and technology, partnering with businesses and entrepreneurs to bring ideas to reality. AURI staff are skilled at walking clients through the entire development journey of bringing a new product or process from idea to reality.

Service Areas: What AURI Provides

Applied Research

Through practical, applied research we identify emerging opportunities to add value to agriculture products. This information is publicly available in order to help entrepreneurs and businesses generate ideas for new products and processes.

Hands-on Scientific Assistance

Scientists are available to provide consulting and technical services in the areas of:

- Product and process development
- Product evaluation and testing
- Sourcing materials equipment and services

Innovation Networks

When deciding the feasibility of a new product or process, it is critical to have access to industry experts and a science-based network of people. With a broad range of networks, AURI can help bring together the right people at the right time to help bring new products and processes to market.

Learn More

- Contact one of the AURI Offices to speak with a project development director about your business.
- Visit auri.org to see the latest research and learn about upcoming events.
- Sign up to receive the *Ag Innovations News* or the AURI electronic newsletter to stay informed about AURI projects and clients.

 Join the conversation on Facebook at [AgriculturalUtilizationResearchInstitute](https://www.facebook.com/AgriculturalUtilizationResearchInstitute)

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The Nexus of

Food & Health

is a Popular Space

BY AURI

This past October, during the first-ever Food Ag Ideas Week, AURI along with partners MyFormulary and Larta Institute co-hosted a special event called *The Nexus of Food & Health*. Minnesota has a rich history in both food science and medical innovation and advancing functional food innovations is a perfect fit to capitalize on the expertise residing in the area.

The event brought together some of the most knowledgeable voices on a variety of topics related to the nexus space shared by food and personal health. Over the course of the day, attendees listened to presentations on everything from modeling personalized health care through big data to the exponential effect of functional food and exercise.

“This was an important event because it bridged industries and brought together scientists, physicians, chefs, entrepreneurs, investors, and healthcare executives with aligned goals for significant change and greater health outcomes,” said MyFormulary CEO Adam Southam.

The day kicked off with a live food preparation demonstration of functional food recipes by Dr. Kate Shafto and Culinary Nutritionist Jennifer Breen. Together, they shared their experiences and expertise in cooking with functional foods and the benefits of starting your day with a healthy meal.

This topic dovetailed into presentations on disease management through food and medical nutrition. Both presentations discussed how certain foods could offer a preferable form of disease management therapy, in place of some traditional medications. One highlight from this section included the participation of AURI client, Step One Foods, which has conducted clinical trials to validate their food products can successfully replace statin medications.



“The nexus event was an important platform to highlight the efforts of functional food companies because there is a general lack of awareness about how functional foods can help manage certain diseases,” said AURI’s Executive Director Shannon Schlecht. “Highlighting these companies was a great step forward in educating people about the existence and benefits of functional foods.”

From there, the event transitioned to discussing how other industries could play a role in increasing the impact of functional foods. In the first afternoon session, health insurance executives discussed the potential future of the industry with regard to coverage of functional foods and integrative medicines.

Next up was a presentation by Recombinetics outlining the benefits of precision breeding for animals, producers and consumers. Included in this session was an overview of the current global landscape for gene-edited food products. This session was of great interest to the audience, as gene editing is a hotly debated topic among food professionals and the general public.

The final session of the day included stories of the David & Goliath variety by bringing together successful entrepreneurs from the functional food industry. They discussed their experiences, which could best be described as tales of trials and tribulations, while overcoming a variety of adversity. This session inspired the audience because it showed the combination of good products and tenacity is a recipe for success.

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