



# Ag Innovation News

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## TAKING THE NEXT STEP

The next generation of Hmong farmers is poised to step into the value-added product arena

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PHOTO BY ROLF HAGBERG



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PHOTO BY ROLF HAGBERG



## A big step for better service

BY SHANNON SCHLECHT  
AURI EXECUTIVE DIRECTOR

Over the past six months, you've likely read about AURI taking new steps to further develop its business model. These steps are the result of a legislative audit and efforts to better align with the Minnesota State statute that governs the organization. The Minnesota legislature has been an amazing partner and supporter of AURI over the years and these new steps will better leverage the state funds to provide new and better services to enhance food and agricultural innovation commercialization across the state.

So far, this includes the pursuit of revenue from intellectual property, registration fees to cover event costs, and financial resources from charitable giving. This month, AURI takes the next step in its efforts by implementing a partial fee for service business model, where clients pay a percentage of the overall project cost while the remainder continues to be subsidized by AURI.

Rest assured AURI's priority is maintaining existing relationships—always with the objective of adding value to Minnesota agricultural products and helping Minnesota entrepreneurs successfully bring their innovative products to market.

Equally important in this transition is our desire to keep AURI services accessible and affordable to smaller companies – those who most need AURI services and can yield the greatest benefit from them. To that end, AURI has developed a tiered, sliding scale structure for this new model that should have minimum impact on those smaller businesses, farmers and entrepreneurs:

| <br>Minnesota Clients | Client-Company Annual Gross Revenue | Percentage of Project Cost Paid by Client |
|--|-------------------------------------|---|
|  | Less than \$250,000                 | 20  |
|  | \$250,000 to \$5 million            | 33  |
|  | 5 million to \$100 million          | 50  |
|  | More than \$100 million             | 100                                       |

As you can see, AURI assistance remains very affordable with the subsidized cost structure. Small business owners and entrepreneurs will pay as little as 20 percent of the project costs, which equates to about \$15.00/hour for professional technical services, for initial idea advancement.

Please note also that AURI will continue to provide important free resources, including the initial project development efforts, as well as webinars and workshops that serve clients and potential clients at all revenue levels. And, as we do now, each year we will disseminate information from multiple industry initiatives that can help advance ideas into commercial reality.

This latest step to enhance AURI's resources will allow the organization to directly reinvest into new project resources so it can provide more and better services to its business clients. This, in turn, has the potential to strengthen AURI's ability to help businesses and entrepreneurs, while reducing their wait time for initiating a project.

I understand this is a change from how we have provided services in the past and as such, I am happy to discuss it with you further or answer any questions you may have. Feel free to contact me at [sschlecht@auri.org](mailto:sschlecht@auri.org).

‘AURI’s priority is maintaining existing relationships— always with the objective of adding value to Minnesota agricultural products and helping Minnesota entrepreneurs successfully bring their innovative products to market ’



BY AURI

This quarter the Ag Innovation News brings you an interview with AURI board member, Jerry Hasnedl. Jerry has served with distinction for the last three years, representing Minnesota Farmers Union. In doing so, Jerry brings the necessary talents of critical thinking and problem solving to board meetings and offers unique insight in the area of value-added agriculture.

**AIN** Which agricultural group do you represent?

I represent Minnesota Farmers Union on the AURI board.

**JH**

**AIN** Please give us some highlights around your ag background.

After serving four years in the U.S. Air Force, I obtained an associate's degree in ag economics. I then worked for and helped manage an agricultural equipment manufacturing company for eight years. After which I took over the family farm for the next 35 years and am now transitioning the farm to my son and his family. During that farming career, I served on many cooperative boards including 19 years on the CHS corporate board. I am just finishing my first three-year term on the AURI board.

**JH**

**AIN** What direction do you see value-added agriculture going during the next three years?

I am inclined to think that the relationship between agricultural production, nutrition and related nutraceuticals may be at the forefront of value added.

**JH**

**AIN** As a leader of AURI, what kind of future collaborations would you like to see the organization undertake?

I would like to see AURI build on its relationships with other farm organizations. More than ever, we see how important relationships are for supporting as well as sharing information and knowledge.

**JH**

**AIN** In this issue of AIN, the executive director unveiled the new fee-for-service model. What do think is important for people to know about this?

I would like our current clients as well as future clients to share their thoughts and opinions with us as we introduce this new program. AURI needs to grow its funding base as we grow our organization.

**JH**

**AIN** What do you hope to accomplish during your time on the board?

I hope to see this organization become even more relevant and important to agriculture. I want AURI to be financially solid with a clear path to providing technology and expertise to every client that walks through the door. I would also like to see AURI develop a regional footprint because it can benefit border-states by sharing expertise and resources.

**JH**

**AIN** What are your goals for the AURI Board of Directors?

I want to see the AURI board focused on giving AURI's staff the tools and resources to fulfill the organization's mission.

**JH**

**AIN** What do you see as the AURI Board of Directors' greatest strength as a group?

The AURI board of directors exhibit the diversity of talents and expertise to provide leadership and direction for our organization. I see all the skill sets necessary to be successful in these challenging times.

**JH**

**AIN** Funding is a big topic right now with AURI moving to a fee-for-service model, as well as accepting donations from the public. Why are these important steps for AURI?

I think the key to growing of funding sources is raising the awareness level about the organization. As people hear about our success stories and hear the stories our clients have to tell about what we have been able to do for them I believe people and organizations will step forward and help fund our efforts. We need to practice asking too!

**JH**

# Biobased Focus Area

BY AURI

Biobased products enable the transition from traditional petroleum-based materials to agricultural resources in the production of plastics, films, building materials and chemicals. AURI supports clients through hands on technical assistance in the form of sample analysis in the AURI analytical laboratory, byproduct development in its pilot facility, and by working directly on site with clients to trouble shoot and brainstorm specific topic areas.

The AURI Biobased Team, comprised of scientists and staff throughout Minnesota, takes advantage of the resources and expertise within all its facilities. One of their greatest strengths is the recognized integrity of AURI staff to work on critically important projects for clients on a confidential basis. AURI staff are routinely involved in projects, which support intellectual property, trade

secrets and other proprietary business information. The number and diversity of these activities is a testament to the integrity and capability of the project teams.

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The AURI Biobased Focus Area continues to make important contributions to biobased product development which is an ever-expanding portion of the Minnesota agricultural economy.

One of their greatest strengths is the recognized integrity of AURI staff to work on critically important projects for clients on a confidential basis



## SWHEAT SCOOP

### Wheat-based cat litter

Swheat Scoop, is a renewably-sourced wheat-based cat litter, initially made by Pet Care Systems-now part of Farmers Union Industries. AURI has been instrumental in product development, and working on the processes that impact the efficacy of the product, while focusing on quality control to help make the product more consistent.

## REPLAY

### Biobased road preservation

This soy-based sealant permeates pavement surfaces and serves to protect roadways from deterioration, maintains skid resistance for vehicles, reverses the oxidation process, and protects asphalt from potholing, edge rutting and cracking. To encourage the awareness and potential adoption of the sealants, AURI in cooperation with partners disseminated technical information directly to key decision-makers who could bring this technology to cities, municipalities, parks and commercial properties throughout Minnesota.





SUPER BOWL LII WILL HAVE SOME

Panache®



BY AURI

For most of AURI's clients, hard work and perseverance are critical to success. Most recently, food client, Panache, which makes a variety of infused apple juices and ciders, proved this. In the months leading up to the new year, Managing Partner, Ameeta Jaiswal-Dale and Marketing Director, Xavier Boulard's efforts paid off when their company was named as an approved beverage vendor for Super Bowl LII.

## Making the Cut

While the Super Bowl itself is a one-day event, the entire experience is so much more. Surrounding game day there are an estimated 200 parties and large-scale events, attended by more than 100,000 visitors who bring with them a projected economic impact of \$400 million in revenue for the Twin Cities. That's a lot of potential business and opportunities for companies who provide food and beverages as well as promotional materials and event planning.

While large and well-established businesses in these areas may already have connections helping gain Super Bowl projects, smaller businesses face more of a challenge. To give smaller and newer businesses a chance to compete, the Super Bowl Host Committee, in partnership with the National Football League, launched the Super Bowl LII Business Connect Diversity and Inclusion program in the fall of 2016. The program invited small and minority-owned Minnesota businesses to apply for Super Bowl LII contracting opportunities and interview through "Business Connect."

Over a two-day period, upwards of 3,000 businesses applied and gave five-minute pitches to one of six judging panels. Not a small feat considering each business had to set up their product, give their pitch and clean up in that small window of time. The judges whittled down the field to 1,000 in the first round, then down to the top 100, which included Panache being named as an official beverage.

## Ready to Run

For Panache, the main requirement of an official vendor is to be ready at all times and during all occasions to respond to any and all requests for Panache beverages. To help meet the additional requests for product Jaiswal-Dale shared, "We have scaled up our production of all infused flavors and are planning on hiring interns to service the needs during the months of January and February."



With the NFL theme of "Bold North" for this Super Bowl, Panache stepped up and created a special beverage featuring the name. "We have introduced a new infusion called 'BOLD NORTH' made with Minnesota grown elderberries infused in fresh apple juice," said Jaiswal-Dale. The elderberry gives the beverage a purple tint coordinating nicely with the host team's Viking colors.

## Teaming up with AURI

Earlier this year AURI coordinated a sensory panel where numerous clients, including Panache, were able to meet with community representatives and experts who sampled their products. According to AURI Project Development Director, Harold Stanislawski, "The sensory event was a great experience for different entrepreneurs to meet with an outstanding panel of judges and receive immediate feedback. These experiences are valuable to businesses like Panache."

Meanwhile, AURI's Scientist of Food and Nutrition, Lolly Occhino, coordinated analytical testing of the apple content for some of Panache's products, mainly for its nutritional characteristics. "Now is a great time to be starting a new food business in Minnesota because there are more organizations and resources supporting start-ups and a growing desire for locally produced foods. Even larger retailers are looking for locally produced items, something that 10 years ago was found much less frequently."

For Stanislawski, "One of the joys of working with companies like Panache is providing the assistance they need in a collaborative partnership, because we all learn from each other about value-added commodities." AURI was able to connect Panache to people in the elderberry growing industry to assist in formulating the Bold North infusion beverage. "At AURI we work with multiple sectors in the state benefitting everyone from entrepreneurs to growers, packers to distributors and retailers who can all benefit from marketing a particular product."

AURI continues to strive for success with its client partner by exploring new tastes and product lines containing the heirloom apples and unique flavors of Panache.

*Panache founders, Ameeta Jaiswal-Dale and Xavier Boulard, scaled up their production of all infused flavors and are planning on staff to service the needs of Super Bowl LII.*

# TAKING THE NEXT STEP

DAN LEMKE

They may not raise corn, soybeans or wheat, or farm large parcels of land, but Minnesota's Hmong American farmers have transformed the state's urban agriculture and local food landscape. Now the next generation of Hmong farmers is poised to take the next step into the value-added product arena.

Hmong refugees resettled in Minnesota from Laos and Thailand in the 1970s as political refugees following the Vietnam War. True to their heritage, many families relied on their agricultural backgrounds to make a living, growing produce and flowers for local farmers markets. By the late 1980s, Hmong farmers had revitalized the St. Paul and Minneapolis farmers markets.

Cultivating small parcels of just a few acres or less, the Hmong American farmers provided fresh produce like peppers, bok choy, cabbage and cut flowers that fueled exponential growth among farmers markets in both suburban and urban communities. But they faced challenges that made sustaining their farms and way of life difficult.

Pakou Hang authored a research project that showed Hmong American farmers made less per acre than other vegetable farmers. While other growers could return \$8,000 per acre, Hmong farmers were only generating about \$5,000 per acre. But that wasn't the only challenge Hmong farmers faced.

"There was access to land near the Twin Cities, but there was no land tenure, no long-term leases so farmers couldn't invest in planting perennials," Hang says. "They also had difficulty accessing markets, like selling into public schools. They had no access to farm credit, capital or loan programs. They also lacked training and connection to research."

To counter those challenges, the Hmong American Farmers Association (HAFA) was formed in 2011 with Hang as its executive director. The group's mission is to advance the prosperity of Hmong American farmers through cooperative endeavors, capacity building and advocacy. HAFA facilitates access to land, markets, loans and training.

"We serve as a thought leader and contributor to the local food conversation and fair food economy," Hang says. "We're lifting up those who are most marginalized."

HAFA manages a 155-acre farm in Dakota County. There member families can lease land, hone their business and agricultural skills, and sell produce to the HAFA Food Hub, which aggregates and sells members' produce through community-supported agriculture shares, schools, retailers and institutions.

## Building the Next Generation

Like most of Minnesota's producers, the population of Hmong American farmers is aging, and their numbers are dwindling. Hang estimates there are 250 to 300 Hmong farmers in Minnesota. She says many children of the state's first-generation Hmong farmers are not pursuing farming, in part, because of a proliferation of farmers markets. Because there is a saturation of markets, the Hmong growers aren't earning as much money.



HAFA is working to stem that tide by promoting value-added products as a new opportunity.

"The value-added cohort is our answer to dealing with the aging population and incentivizing our young farmers to stay in the business," Hang says. "We are trying to build intergenerational wealth."



Hang says value-added enterprises that market packaged foods instead of solely relying on fresh food markets helps to do more than just build potential profitability. Some produce has imperfections that make it less desirable to sell as fresh products. By further processing them into packaged products, farmers may be able to capture additional value. Value-added processing also opens the door for the next generation.

"The children of our first-generation farmers may not want to farm because they have jobs and families, but they can stay in the family business through value-added production," Hang says.

Hang says there has been a pattern throughout history where farmers have turned to value-added products to stay profitable and keep the next generation involved.

"We've seen that in places like Vermont where dairy farms have kept their kids involved in the farm by making things like cheese and yogurt. In the farm economy, farmers have had to do value-added to diversify their revenue sources."

"Further processed consumer products are something farmers can produce that enables them to go into a grocery store instead of relying on wash and sell products at a farmers market," says AURI Senior Project Strategist Michael Sparby.

## An Introduction to Value Added Agriculture

HAFA organized a curriculum and series of training sessions to help Hmong farmers

learn about and better understand the many aspects of value-added production. Hang says the training is designed to help farmers navigate the most intimidating aspects of business development including product development, regulations, consumer trends, marketing, packaging and food safety. They've also conducted panel discussions with entrepreneurs who have made the leap.

"We try to help them address the scary parts, but let them see what's possible by bringing in those who have done it," Hang adds.

Through the process of developing their curriculum, Hang learned about AURI and recognized there would be value in partnering.

"We knew that our farmers will face some technical challenges, but we see AURI as a critical partner, providing valuable services and perspective for our farmers and their value-added success," Hang says. "Their technical support and breadth of value-added knowledge gives us a much needed perspective."

Sparby participated in HAFA's curriculum, presenting information about AURI services, other resources that are available, and some of the challenges that come with entering the world of further processed products.

"This is fairly new for them, but I think it will grow in the future once one or two farmers are successful," Sparby contends. "Success breeds success."

## Moving Forward

AURI Food and Nutrition Scientist Lolly Ochino met with HAFA members and



HAFAs advance the prosperity of Hmong American farmers through cooperative endeavors and facilitating access to land, markets, loans and training.

provided technical insights to several farmers who are interested in bringing value-added food products to the market. The farmers are pondering products ranging from snack and health foods to traditional Hmong meals and beverages. Occhino has years of experience in the food industry, so she is able to provide perspective budding businesses need.



“The HAFAs members I’ve met with are passionate around their ideas, but the process of getting a product to the market is all pretty new,” Occhino says, “but it’s not unusual for us to see that in our food clients. We’re here to help them think through things and offer up ideas to help them pursue their concept.”

Occhino says that although the concepts may be in their infancy, the potential is there for the farmers to move from relying solely on fresh products to adding prepackaged items that meet a market need.

“They’re all looking at products that cater to the Hmong community where there are needs that can be filled,” Occhino says. “That’s a good thing because these farmers know the community, know what people like and know how to use their products.”

## Making a Mark

Minnesota is home to a long list of food industry giants including General Mills, Hormel, Land O’ Lakes and Schwan’s. The state also has a vibrant local foods culture that many Hmong American farmers appreciate.

“Minnesota has a real food-entrepreneurial spirit that includes big companies and smaller dynamic food enterprises,” Hang says. “Our farmers are being influenced by this culture and want to add their own piece.”

Hang says as the farmers work toward introducing value-added products to the market, partnerships with resources like AURI will be very beneficial.

Dozens of Hmong farmers have participated in the HAFAs training. Sparby says a number of them have met with AURI and he expects several projects to move forward in 2018.

Hang says the next step for farmers and their children is to launch some prototype products that can be tested and sold in small batches to refine their process and learn what it takes to succeed.

“They need their food products to be safe, their business plans tight and their marketing plans dynamic,” Hang says.

Venturing into value-added products may be new, but Hang says, “our farmers want to add their stamp to Minnesota’s food culture.”

# HAFAs Receive Community Innovation Grant

HAFAs advance the prosperity of Hmong American farmers through cooperative endeavors and facilitating access to land, markets, loans and training. was one of seven organizations to be awarded the 2017 Bush Prize for Community Innovation. The Bush Prize celebrates organizations that are extraordinary not only in what they do but in how they do it.

“The Bush Prize recognizes organizations that are creative, fierce and dogged in the way they work and in what they accomplish,” says Bush President Jennifer Ford Reedy. “As models for problem solving, they consistently pick a path of innovation that drives profound results for their communities.”

Bush Prize winners receive a package that includes promotional support and materials, and an unrestricted grant. HAFAs received \$247,425 from the Bush Foundation.

The Foundation received 127 applications from Minnesota, North Dakota, South Dakota and the 23 Native nations that share the same geography for the 2017 Bush Prize. Three panels of community members chose the winners from their respective states.

“The 2017 winners are unstoppable forces who show up every day determined to create collective solutions for their communities,” says Mandy Ellerton, Bush Community Innovation Director. “They push through challenges and hardship for causes they care about, stirring up and inspiring much-needed change in the places they call home.”

“We are humbled and honored by the Bush Prize because it recognizes Hmong farmers and their entrepreneurial spirit,” says HAFAs Executive Director Pakou Hang.



# THE DNA OF INNOVATION

## AURI Award Winner Has Long Value-Added History

BY DAN LEMKE

Founders of the Chippewa Valley Ethanol Company (CVEC) in Benson were among the first to ride Minnesota's growing ethanol wave. CVEC formed in 1995 and began processing corn into ethanol in 1996, becoming just the fifth enterprise in a state that now boasts 21 corn ethanol plants.

CVEC's Benson facility has the capacity to produce 50 million gallons of ethanol annually. The plant consumes over 17 million bushels of corn each year and has 975 cooperative owners. Although ethanol and coproducts like dried distiller's grains (DDGS) were the first materials produced at the plant, CVEC has a more than 20-year track record of looking for new and innovative ways to get the most from the corn they process.

"It goes back to the initial culture when CVEC was founded," says General Manager Chad Friese. "We were one of the first ethanol plants, but we've always been willing to build on our diversity and take a look at other things. We've done a lot to try to add value for our producers."

Those efforts include looking beyond their own facility.

CVEC is a founding member and part owner of Renewable Products Marketing Group (RPMG). Headquartered in Shakopee, Minnesota, RPMG markets about 1.3 billion gallons of ethanol and 1.5 million tons of distiller's grains annually. In addition to operating their own ethanol plant, CVEC also has ownership stake in ethanol plants in Janesville, Minnesota, Lima, Ohio and Hankinson, North Dakota. Additionally, CVEC retains minority ownership in Frontline BioEnergy, a gasification technology company headquartered in Ames, Iowa.

### Diversity Reigns

Friese says that since the coop's early days, CVEC has placed a high value on innovation.

"We've never said, 'we've always done it like this,'" Friese says. "Times are always changing. We have to be able to change with them."

As with most ethanol plants, fuel ethanol and DDGS for feed are the primary economic drivers for CVEC. Corn oil produced at the plant is used as a feedstock for biodiesel and other industrial applications.

"Fuel and feed are the big drivers, but through diversity we've found other niches," Friese says.

In addition to producing 50 million gallons of ethanol each year, CVEC's diverse business enterprise includes Glacial Grain Spirits (GGS), which manufactures industrial, food-grade ethyl alcohol and beverage spirits.

Established in 1998, GGS is one of the only farmer-owned industrial and beverage alcohol product manufacturers in the United States. The alcohol GGS produces is used in many household products including hand sanitizers and cleaners as well as antibiotics, vitamins and vaccines.

Glacial Grain Spirits is both kosher and organic certified. Because they follow rigorous standards, GGS is able to market to some high-end cosmetic companies.

CVEC has also entered the market for human consumption products. Prairie Spirits is a subsidiary of Glacial Grain Spirits and manufactures organic alcohol products. Prairie Spirits items meet or exceed the purity standards for traditional ethyl alcohol used in industrial, food, beverage, or pharmaceutical applications.

Glacial Grain Spirits also produces its own product line called Prairie Organic Vodka. GGS buys the grains used for Prairie Spirits from local organic growers. The grains are shipped directly from the farm to the GGS manufacturing facility for processing.

### Recognized for Innovation

Because of their innovative spirit and value-added diversification, CVEC was selected as AURI's 2017 Ag Innovator of the Year. The award annually recognizes a Minnesota company that has achieved commercial success and adds value to the state's agricultural commodities.

"From their inception, CVEC has been a recognized leader in the industry," says Michael Sparby, AURI senior project strategist. "They're not only producing ethanol, they're willing to look at what else is out there and then engage in those opportunities."

Sparby says AURI has worked with CVEC on a variety of projects over the years. He adds that in addition to their own ideas, CVEC staff has been willing to listen to ideas from other entrepreneurial businesses.

"For AURI, they're a great partner. We're able to bounce ideas off of them. If there's potential, they will explore it further," Sparby says. "They've been a great resource from that perspective."

"It's part of our culture to be constantly looking forward," Friese contends. "If we're closed off to other ideas, we might eliminate a lot of opportunities."

Friese says working with resources like AURI and the University of Minnesota-Morris to evaluate new technologies has been a big help for the company.

### Learning Process

Being on the leading, innovative edge of the industry means there are both hits and misses. Over the course of two decades, not every idea CVEC has tried worked out according to plan.

Several years ago, CVEC installed a gasification system to convert biomass materials like corn stover, wood or corn cobs into syngas. This gas could then be burned as an alternative fuel, reducing the ethanol plant's natural gas requirements. The system worked well, but the discovery of the hydrofracking process to extract natural gas from shale caused a shift in the landscape. Natural gas supplies were more widely available, and the price dropped.

"The gasifier was a great project, but we didn't know that the price of gas would go way down, so the payback hasn't been there," Friese admits. "It's a great technology, but the economics changed and operating the gasifier became uneconomical."

Friese says the company knows not every innovation is going to be a success, but that doesn't discourage them from continuing to look for new opportunities to add value to agricultural products or to be more efficient in how they operate.

"We have tried to take a cautious approach to new ideas," Friese says. "We have engineers who are constantly evaluating new technology to see what it could mean for us. These technologies may work for us at some point in time because we don't know what the future will look like."

Some of the technologies CVEC has evaluated helps them to process corn more efficiently. All ethanol plants are required to thermally sterilize the air their process emits so no organic compounds are discharged. The process means heating air to 1200 degrees Fahrenheit. CVEC identified and has installed a system that helps them recover some of that heat to be used elsewhere in their manufacturing process.

"We've had a lot of focus on energy efficiency. We strive to produce more with less," Friese says.

Whether innovations lead to the identification of new revenue streams or ways to produce ethanol and other products more efficiently, Friese says CVEC's primary goal is to benefit their farmer-owners and the rural communities in which they live.

"We are trying to return value to the rural economy," Friese says. "The best ways to do that is to be effective. If we are doing well and staying relevant, then our goal is being fulfilled."



## Chippewa Valley Ethanol Company (CVEC)

# ‘INNOVATION IS WHO THEY ARE’

Michael Sparby, AURI senior project strategist at AURI



2017 marks the 15th year that AURI has recognized the importance of agricultural innovations in Minnesota. AURI first presented the Ag Innovator of the Year award in 2002. The Ag Innovator of the Year is given by the AURI board of directors to a Minnesota company and AURI client that has shown innovation in the development of an ag-based product or process and has utilized AURI resources. This recognition

highlights the accomplishments of one deserving business, but is also intended to draw attention to value-added agriculture's overall contributions to the state.

“There are many great ideas generated across Minnesota and it is important to highlight an innovation each year to recognize the ingenuity as well as illustrate to others that turning ideas into reality is possible,” says AURI Executive Director Shannon Schlecht.

Ag Innovator award recipients are AURI clients and must use agricultural commodities to be considered. They must have created a unique or disruptive use, have been successful or are on the verge of greater utilization of Minnesota agricultural commodities in a higher value product that is manufactured locally.

Chippewa Valley Ethanol Company (CVEC) in Benson, Minnesota, was selected as the 2017 Ag Innovator of the Year because of their focus on adding value through diversification.

“Innovation is who they are,” Sparby says. “They embody the cooperative spirit in how they operate and how they approach their business.”

CVEC General Manager Chad Friese appreciates the recognition for the company's innovative efforts.

“Receiving this award means a lot,” Friese says. “It's an honor to be recognized for our innovation and our forward thinking.”

Schlecht says that any value that can be added in Minnesota helps to utilize local production, create jobs and advance the state and regional economy. Many AURI agricultural innovation projects are in rural areas, which positively impacts small towns and farming communities.

An AURI survey of about half of AURI's agricultural innovation projects conducted between 2010 and 2016 illustrates that value added agricultural innovations contributed nearly \$77 million in additional annual sales, \$90 million in capital investment over the six year period, usage of an additional 324,000 tons of agricultural commodities each year and also helped create or retain over 600 jobs across Minnesota during that time period.



CVEC entered the market for human consumption products in 1998 and in recent years launched Prairie Spirits, which uses grains from local growers for products like Prairie Organic Vodka. Prairie Spirits produces some of the finest products, which exceed the purity standards for traditional ethyl alcohol used in food and beverages.



PHOTOS BY ROLF HAGBERG

# Looking to the future of Biofuels

BY AURI

Australian researchers are studying the possibility of turning crops like agave, hemp, or the native saltbush and wild-growing sorghum into biofuels of the future. Studies show that it's possible to extract non-traditional plant oils and turn them into biodiesel for vehicles, machinery and even aviation fuel.

Currently oils extracted from palm and soy cost roughly twice the price of crude oil in Australia. "It really is fundamentally an economic problem rather than a technological problem," says Dr Allan Green, innovation leader for biobased products at CSIRO Agriculture and Food. His solution is to modify plants to make them produce more oil per section of land, which means harvesting and production costs would predictably fall. Green and his colleagues patented a way of modifying the genetic levers that control oil output in plants, so a plant produces oil not just in its fruit or seeds but in its leaves as well.

Presently the technology shows one can increase oil production in tobacco to a third or more of the leaf's weight, producing more oil than occurs naturally in any plant. If this technique is demonstrated in a crop that already produces oil in its seeds or fruit, the hope is that oil output could be multiplied, though that theory has yet to be proven.

Technology in processing is also influencing the direction of the biofuel industry. Traditional approaches use fermentation to turn plant sugars into bioethanol, or oils that can be chemically transesterified for biodiesel production. Much research has gone into finding the perfect crops for these applications: plants dense in sugar-laden cellulose, but without the extraction-complicating lignins; or plants that pump out high oil volumes. Another consideration is a more flexible methodology, with regard to the kinds of plants that can be utilized.

One process, hydrothermal liquefaction uses heat and pressure to break up the long-chain molecules in whole plants into bio-crude oil, essentially reducing eons of geological time into a matter of hours. The resulting bio-crude oil can then be refined as a petroleum-based crude oil would be, producing an array of fuels as well as plastics and other products.

Similarly, torrefaction, which has been adapted from roasting coffee, can turn essentially any plant matter into bio-coal pellets. While both of these processes are energy intensive, "combining them with renewables like solar panels or wind turbines – or locating them near power stations that could harvest excess heat, would make the operations more environmentally sustainable," says Rachel Burton, leader of the ARC Centre of Excellence for Plant Cell Walls at University of Adelaide.

The advantage of a non-traditional approach is that producers wouldn't be limited to crops designed to be biofuel-only commodities but instead could choose varieties that deliver value-added benefits. Agave could be used to produce a high-value tipple, for instance, or hemp farmers could harvest seed for food and fiber for carpeting or fabric along with biofuels.

The biofuel industry could prove to be a very diverse one according to Green. "The amount of fuel we need to move away from petroleum is massive, so there's plenty of space for all technologies," he says.



## 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.*



### A sweet solution?

#### Biodegradable Plastic made from Sugar

Scientists from the Centre of Sustainable Chemical Technologies (CSCT) at the University of Bath have successfully created a plastic that doesn't use harmful chemicals, and is biodegradable.

It is made from nothing more than sugar and carbon dioxide.

Co2 is added to a naturally occurring sugar called thymidine at low pressures and at room temperature.

weforum.org

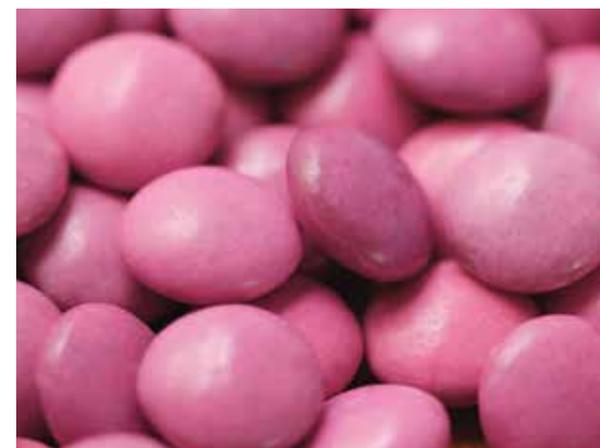


### Farming with Fungus

Mushrooms are the fruiting body of a vast fungal organism, most of which exists below ground in the form of mycelium, the white stringy fungal network that plays a key role in ecological health. Scientists have infused these mycelial networks into the roots of plants, which allows them to endure extreme drought that otherwise would destroy them.

Mycologist Paul Stamets has incorporated helpful fungus into a cow pasture, in which harmful bacteria from waste is absorbed and purified by the fungus before it reaches a water source. Stamets has also developed a patent for a fungal pesticide that destroys pests without the use of harmful chemicals.

inhabitat.com



### Chocolate in the Pink

#### Meet Ruby - the first new type of chocolate in 80 years

Swiss chocolate makers have added a new color to the chocolate cache. It's rosy, fruity, and looks like it came straight out of that generator that's slowly turning everything around us millennial pink. Introducing ruby chocolate, the newest natural chocolate variety since the creation of white chocolate 80 years ago by Nestle.

The pink hued product comes to us from the labs of Barry Callebaut AG, the world's largest cocoa processors. Though the color may lean more pink than red, its developers are sticking to "ruby" when labelling their newest chocolate.

weforum.org

## 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

How many turkeys did Minnesota produce in 2016 as the nation's highest producer?

- a. 18.4 million birds
- b. 33.5 million birds
- c. 44.5 million birds
- d. 51.2 million birds

Data are reported in the NASS Poultry Production and Value report.

Answer: c

### Renewable Energy

Ethanol is an alcohol fuel made from the sugars found in grains such as corn, sorghum, and barley.

Other sources of sugars to produce ethanol include:

- a. Potato skins
- b. Tree bark
- c. Sugar beets
- d. All of the above

[https://www.eia.gov/energyexplained/index.cfm?page=biofuel\\_home](https://www.eia.gov/energyexplained/index.cfm?page=biofuel_home)

Answer: d

### Coproducts

Okara, which can be used for livestock feed is the name of the pulp left over after filtering the pureed seed from which of the following based beverage:

- a. almond
- b. soy
- c. coconut
- d. hemp

Answer: b

### Biobased Products

What is the estimated number of products able to be derived from Industrial Hemp?

- a. 1,000
- b. 7,000
- c. 10,500
- d. 25,000

Industrial Hemp from Seed to Market-Cornell University

Answer: d

## 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](http://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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PHOTO BY ROLF HAGBERG

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# New Uses Forum: Adding Value at the Speed of Innovation

APRIL

12

For the second year in a row, the Agricultural Utilization Research Institute (AURI) will host a New Uses Forum to highlight current and potential innovative uses for the agricultural commodities produced in the state and region.

Scheduled for April 12, 2018, with a networking reception on the preceding evening. The theme, "Adding Value at the Speed of Innovation" will focus on how rapidly the value-added agricultural sector changes with the commercialization of new innovations.

"Following last year's event, AURI received a lot of positive feedback from participants," said AURI Executive Director Shannon Schlecht. "Based on that feedback, we felt it was important to continue the event and share the latest innovations in value-added agriculture."

Similar to the inaugural event in March of 2017, the next forum will bring together knowledgeable guest speakers from throughout the new uses and value-added agricultural sectors. Keynote speakers will share trends and industry overviews of these sectors, while group panels will give more detailed overviews as well as insight into their respective organizations' experiences.

"I want the 2018 event to build on where we left off last year," said Schlecht. "I hope that we can bring together some of the best speakers

on the most prescient topics. That's what will make the 2018 New Uses Forum even better than its predecessor."

In addition to the various panels and keynote speakers addressing new topics, the 2018 forum will also include some additions made in response to comments from last year's event. These include longer networking breaks throughout the day, as well as an additional networking reception immediately following the forum.

The forum will, once again, be a premiere value-added agricultural event for the upper Midwest, so be sure to register today! It's easy, you can register now by visiting [auri.org](http://auri.org).

The registration cost will be \$75, which covers both receptions, a lunch, a continental breakfast and networking breaks. Also, AURI has worked out a discounted rate for those who wish to stay at the event hotel, the Crowne Plaza in Plymouth, MN.

"We are thrilled to continue this one-day event to highlight the amazing advances and opportunities in value-added agriculture" says Schlecht.

To learn more about this exciting event, register and take advantage of the special room rates, visit [auri.org](http://auri.org).



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