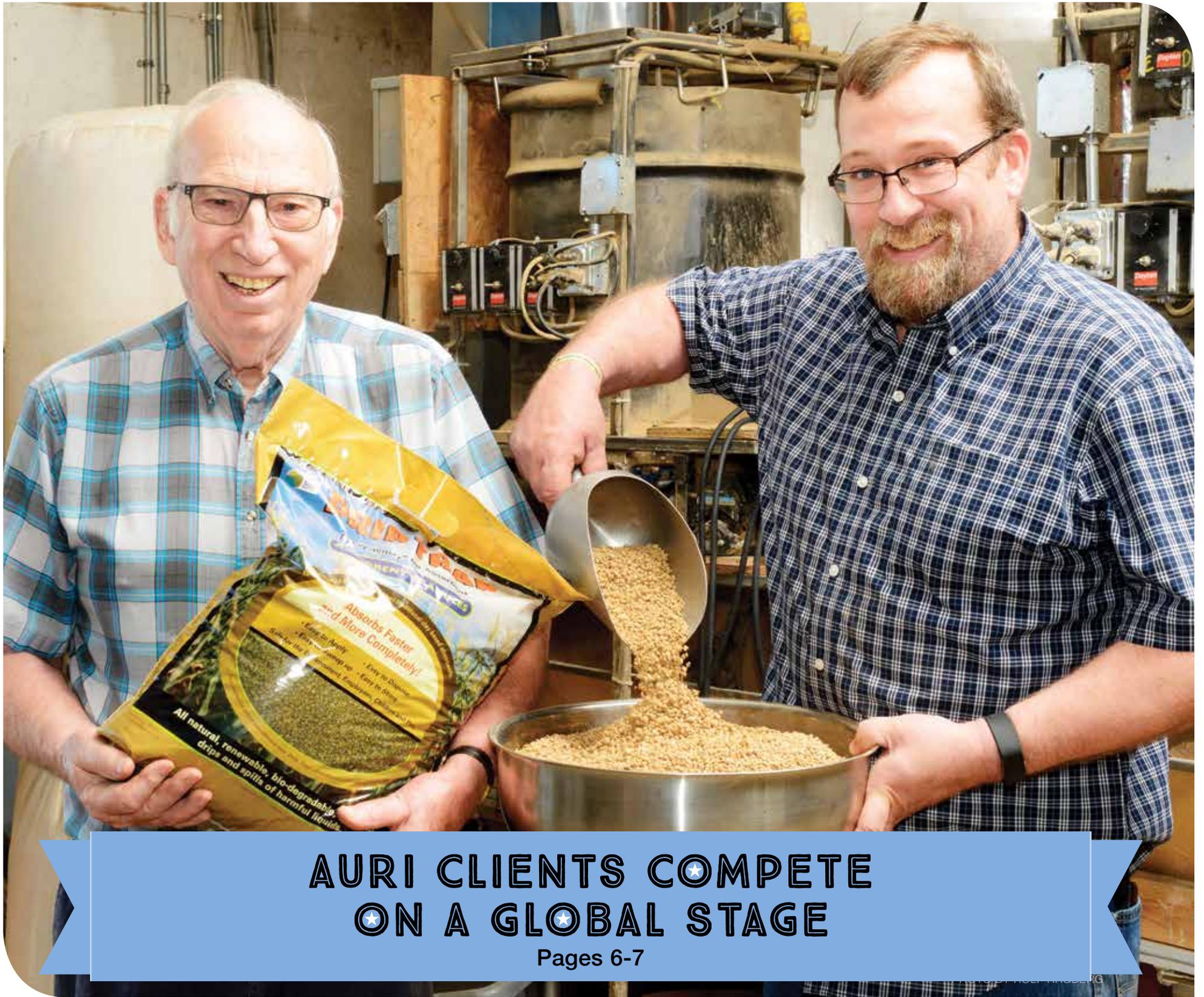




# Ag Innovation News

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The newspaper of the Agricultural Utilization Research Institute



## AURI CLIENTS COMPETE ON A GLOBAL STAGE

Pages 6-7



New Uses Forum a Success  
Page 2



For the Good of All:  
New Public Initiatives  
Pages 4-5



R&D Tax Credit Encourages  
Innovation  
Pages 8-9



Looking to a Dryer Future  
Page 10



## 2018 New Uses Forum a Success.

BY SHANNON SCHLECHT  
AURI EXECUTIVE DIRECTOR

“

Thanks to the combination of strong, engaging speakers and the many educational opportunities, this year's forum proved to be the most successful AURI event.

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This past April AURI hosted its second annual New Uses Forum, which brought together a plethora of knowledgeable voices from across the value-added agriculture sector. Throughout the event, experts shared their experiences and insight with a diverse audience comprised of AURI clients, producers, entrepreneurs, business representatives and owners, government officials, leaders from nonprofit organizations and many other interested parties.

The event served as a platform to connect resources and share experiences to advance innovative food and agricultural ideas. Additionally, for the first time, a special Minnesota food-tasting event occurred at the evening reception with selected AURI food clients to showcase their products, providing a venue to both share their products and the experience of being a food entrepreneur in Minnesota.

The event focused on science and technology applications to help businesses develop new, value-added uses for agricultural products. It also provided a venue to highlight successes and new innovative food and agricultural products, such as the Goodyear Assurance passenger tire which utilizes soybean oil in place of petroleum based products. The program also allowed for ample networking time for participants to connect with speakers and other participants to foster conversations.

Over the course of the day-and-a-half forum attendees heard from individuals who made innovative contributions in these areas. Keynote speakers from S2G Ventures and Land O'Lakes highlighted trends in food and agriculture, including insight on new ideas seeking venture capital to innovative ways to drive sustainable agricultural production. Additionally, focused panel discussions of innovations in coproducts and biobased products, the nexus of food and health, and innovations in Minnesota's industrial hemp sector provided insight to participants interested in developing ideas in these topic areas.

The best parts, though, were the forum's numerous educational elements beyond the panels and keynote speakers and the robust conversations among participants that undoubtedly created new industry connections.

Thanks to this combination of intriguing topics, engaging speakers and the many educational opportunities, this year's forum proved to be the most successful AURI event ever! AURI saw a 20+ percent increase over the previous forum's attendance, and welcomed several more organizations to our family of sponsors. Participants overwhelmingly stated that they found value in the event, plan to attend again in future years and would highly recommend this event to colleagues.

As I write this, a team is already assembled and beginning to plan the next forum in the March/April 2019 time period. Based on feedback from the past two events, the growing ecosystem around food and agricultural innovation in Minnesota and the region, new partnerships and collaborations, as well as plethora of innovative ideas that AURI sees every day, I am positive that the 2019 New Uses Forum will be another spectacular event that you won't want to miss!



BY AURI

This edition of Ag Innovation News brings you an interview with one of AURI's newest board members, Carolyn Olson. She brings a wealth of knowledge on organic growing and modern farm practices to the organization. She is the current District III Director on the Minnesota Farm Bureau Board of Directors, and chair of the American Farm Bureau Organic and Direct Marketing Issue Advisory Committee.

AIN

**Which agricultural group or sector do you represent on the AURI board?**

CO

I represent Minnesota Farm Bureau.

AIN

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

CO

As a new member of the Board of Directors, I'm still learning about the current collaborations. I would like to see more collaboration with dairy groups, so we could help them find markets for their excess skim milk and whey powder.

AIN

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

CO

I grew up in Champlin, Minnesota, and graduated from Anoka High School. The only agriculture experience I really had was visiting relatives on their farm for a week or two in the summer. I met my husband, Jonathan, who was planning on farming with his father after his graduation from Willmar Vo-Tec (now Ridgewater College), in 1987. We married in 1988, and I started helping on the farm right away. Jonathan and his dad were very patient with me, teaching me how to do the various jobs they needed me to do. Jonathan and I now farm together with the help of two employees. We raise organic corn, soybeans, various small grains, and alfalfa on 1100 acres. We also raise pigs conventionally for a neighbor. The manure from the pig barns is used to fertilize our fields.

AIN

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

CO

We all have such unique personalities and experiences that I find so helpful when we discuss the ongoing projects or dream about where we will go in the future. My hope is that I can help others understand the organic side of agriculture as well as the perspectives of a woman engaged in farming. I am thankful that I can also share the knowledge and experiences of the Minnesota Farm Bureau members I represent.

AIN

**What direction do you see value-added agriculture going during the next 3 years?**

CO

There is a lot of potential for growth in value-added agriculture in the next few years. We have been in an extended period of low commodity prices, which has encouraged farmers to look for ways to add value to their crops, whether by growing something a little differently, or creating a new use for what they are growing.

AIN

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

CO

The AURI Board of Directors is such a welcoming board, and all the members are so great to work with. One of my goals is to help maintain an atmosphere where we are free to express ideas and concerns. Another goal is to encourage us to be positive leaders working within our strengths.

AIN

**What are some interesting trends you currently see in value-added agriculture?**

CO

Twenty years ago, my husband and I started transitioning our farm from conventional to organic. The number of farms transitioning into organic is growing. Within conventional agriculture, there has also been growth in the areas of high oleic soybeans, edible beans, and different types of corn.

AIN

**Looking forward, what role do you see the Board of Directors playing in the success of AURI?**

CO

The role of the Board of Directors is to encourage, direct, and protect. If we can encourage continued innovative and creative thinking, direct staff towards projects that fit our mission, and protect the financial and human resources, AURI will continue to be successful.

AURI Releases Four New Reports to the Public on Wide Ranging Topics

# For the good of all



**HELLO**  
my initiative is

## Clean Labels in the Schools

In August 2017, AURI and its Ag Innovation Partner, the Stine Group, surveyed Nutrition Services Directors (NSDs) in 120 Minnesota school districts. The goal was to gauge NSDs understanding and interest in Clean Label products for their programs. Additionally, the survey inquired about their willingness and ability to purchase value-added foods processed in Minnesota.

The results of this survey were collected into a report called *Opinions of Minnesota School Lunch Professionals about Minnesota Food Products*. It highlights a number of points of interest for food entrepreneurs, which may be helpful in getting their products into school lunch programs.

For example, the survey discovered that respondents were familiar with the concept of Clean Labeling, though the majority did not have a Clean Label Program in their district. Also, the report ranked highest and lowest ingredients of concern.

The report also gave an overview of survey respondents' interest in, and access to, Minnesota value added food products, while offering insight into various barriers to incorporating these products into school lunch programs.

Potentially, information from this report could help entrepreneurs and producers avoid known pitfalls and be more directly successful in getting Minnesota grown products to a large and consistent consumer base. To obtain a copy of this report, visit [auri.org/schoollunch](http://auri.org/schoollunch)

**HELLO**  
my initiative is

## New Options for Heating Commercial Poultry Barns

This study, conducted in cooperation with Minnesota Clean Action Resource Teams, Minnesota Department of Agriculture, and Viking Company of Albany, MN, investigated potential advantages of burning biomass, rather than using Liquid Propane gas, to heat commercial poultry barns. It resulted in a demonstration project and report, titled *Advantages of Wood Heat for Commercial Poultry Production*.

The report covers the field testing of a 1.65 million Btu (British Thermal Unit) wood chip furnace in a live commercial poultry operation over the course of 23 months and 12 flock rotations.

Viking Company, an experienced poultry growing operation, hosted and operated the wood furnace in its two-story broiler chicken barn. An identical barn, heated with liquid propane and immediately adjacent to the test barn, served as an experimental control to observe differences in operability, fuel costs, and flock production.

The report includes a number of elements, which investigators studied in the pursuit of determining the efficacy of the biomass heat source. This included observable fuel cost savings against historically low liquid propane prices from fall 2015 through summer 2017. As expected, fuel cost savings from using woody biomass were highest in the colder months when thermal demand is greatest. The fuel cost savings from this project averaged \$8,029 per year with liquid propane prices fluctuating from \$0.99 to \$1.29 per gallon.

Viking Company and its processor, GNP Companies (now Pilgrim's Pride), also observed flock production benefits beyond the estimated wood fuel cost savings, indicating the wood furnace may contribute to reduced production losses.

Overall, this project and the final report provided detailed insight into the use of wood heat to meet the thermal needs of poultry production. The data collected demonstrates woody biomass is a viable, cost-effective fuel for producers looking for alternatives to liquid propane.

A complete report on this topic is available at [auri.org/poultryheat](http://auri.org/poultryheat)

If you are interested in learning more about working with AURI or have a question about the research or findings in these reports, please contact AURI at 218.281.7600.

Each year, AURI undertakes significant initiatives and influential studies related to value-added agriculture, and makes them available to the public in order to further innovation in the areas of food, coproducts, renewable energy and biobased products.

Previous reports covered all manner of topics related to value-added agriculture, and now AURI releases new initiatives focused on the areas of food, entrepreneurialism, biobased renewable energy, and clean labeling trends.

Read on for an overview of the newly available studies, and if they pique your interest be sure to download them from [auri.org](http://auri.org)



**HELLO**  
my initiative is

## Food Pricing

The third report released by AURI dealt with a much different topic—one that is supremely important to food entrepreneurs yet isn't defined well enough during the product's development or the run-up to launch.

In food, the primary objective of the pricing exercise has long been "covering the cost." The thinking behind this exercise is that 'without knowing what your offering costs to make it available to your consumers, you can't know how much money you need to make a profit.' However, food businesses of all sizes must turn that statement on its head.

Without knowing the value of your offering relative to other available options, and thus how much you can charge for that value, you can't know what product, channel, distribution and other costs you should incur to make a profit.

While making sure that covering the costs-of-good-sold is a good management practice, it doesn't fully inform food entrepreneurs about options to optimize cost structure and maximize their gross profits. This report and the exercises contained within it help entrepreneurs determine the best approach to pricing products for their go-to-market journey.

For a copy of this report or its accompanying recorded webinar, visit [auri.org/pricinginnovation](http://auri.org/pricinginnovation)

**HELLO**  
my initiative is

## Protein Study

In recent years, protein ingredients have gained prominence in the food industry. So much so, the expected global demand for protein ingredients is projected to grow from \$25.62 billion in 2016 to \$48.77 billion by 2025. Much of this growth is due to the escalating consumer awareness and demand of for healthy foods. In fact, recent studies have shown protein content is the number one item consumers look for on a nutrition label, with greater than fifty percent wanting more protein in their diet.

Plant proteins are an emerging source, with some utilized in the marketplace; meanwhile food producers and entrepreneurs seek information on the nutritional, physiological and functional characteristics of these proteins. Thus, there was a need to understand the potential of these protein sources to deliver optimal nutrition and functionality. Combined with the fact that traditional protein sources may not be able to meet the growing future demand, AURI conducted a study of novel plant protein sources, entitled A Report on Minnesota Plant Based Proteins for Food.

The report summarizes current knowledge, advantages, and barriers to assess the production feasibility and utilization. This includes information on plant protein sources currently available (commercially produced), emerging (researched and likely to be on the market in the near future), or potentially viable (those with minimal research, but show promise) sources of proteins. It also offers some in-depth information related to best uses and levels of potential each plant-based protein source offers, with the end goal of providing basic information to help Minnesota entrepreneurs explore the potential of utilizing various regional plant protein sources in food applications to address the growing market demand for such products. Another important section of the report covers information about nutritional quality, currently available ingredient forms, functionality and applications, advantages, and barriers to assess the feasibility of its production and utilization for each protein source.

To obtain a copy of this report, visit [auri.org/plantproteins](http://auri.org/plantproteins)

Of the three companies whose products were selected as finalists for the 2018 World Bio Markets Biobased Product of the Year, one may have seemed slightly out of place among the others. World Bio Markets is a leading strategic conference supporting the advancement of a global biobased economy.

The first contender, Stora Enso, is a large pulp and paper manufacturer headquartered in Helsinki, Finland and Stockholm, Sweden, with large-scale operations on four continents. The company has approximately 26,000 employees. Their biobased nominee was an innovative process to harvest lignin from wood fiber to be used as a viable replacement for fossil fuels.

Another finalist, Chemours, is a spin-off from DuPont, with thousands of employees working in “performance chemicals.” Chemours spun off from DuPont in 2015 and was nominated for its plant-based water-repellent fabric.

The third finalist was AURI client Clean Plus, Inc. (CPI), a West Concord, Minnesota, company that has been in operation since 1982 and boasts about a dozen employees. CPI has several divisions that produce and distribute a variety of products, including Drip Trap® Granules, which are made from corn stalks and are used to contain and clean up spills such as chemicals, oil and fuel.

After a two-month evaluation process, a panel of industry expert judges deliberated and decided on the finalists and winners. Submissions from around the world included a process for producing fuel from “fatbergs” floating in sewer systems, bio-based baby toys, innovative uses for lignin and many more.

The glass slipper didn't quite fit for the small, innovative Minnesota company as Stora Enso walked away with the top award given at the World Bio Markets conference held in March in the Netherlands. However, receiving the runner-up award put CPI in some very elite company and shows that innovation knows no size limitations.



“This happened totally organically,” says CPI President Matt Coy. “We were encouraged to enter our Drip Trap® Granules into the World Bio Markets to bang the drum a little bit about our product. We sent them information about the product’s features and benefits and later found out we were on their short list.”

## UNIQUE PROPERTIES

The patented Drip Trap® Granules are made from corn stover, which has a unique cell structure that allows moisture to pass both into and out of the cell. Stover also contains lignin, which attracts hydrocarbons, the main components of petroleum and natural gas. Hydrocarbons become trapped within the cell wall. These properties make corn stalks an ideal media for capturing and cleaning up spills.

“Corn stover is an abundant, renewable, underutilized, all-natural resource,” says George Coy, CPI founder and CEO. “The granules provide a highly effective, environmentally friendly and economical method for capturing spills from oil, fuel, coolant and other hazardous fluids.”

The granules are USDA certified 100 percent bio-based and have the Federal Bio-Preferred Product designation. The granules are a green alternative to clay-based absorbents and they can absorb six times more oil or chemicals than clay.

“We were going up against some very large companies with highly complex processes,” George Coy says. “Just to be mentioned with those companies makes us feel pretty good. They’ve got thousands of employees, we’re producing the granules with about two and a half positions.”

“It is an innovative product and we’re using an under-utilized resource that we can create some value, not only for the consumer, not only for our little company, but also for the growers involved as well,” Matt Coy says. “So, it feels pretty good to be recognized on a world stage for our little operation here in southeast Minnesota.”

## DIVERSE PORTFOLIO

Tucked behind the West Concord, Minnesota grain elevator, Clean Plus, Inc. occupies a building that used to be the local lumberyard. Its unassuming exterior belies an innovative and complex company. The campus is a maze of manufacturing, storage and production facilities indicative of CPI’s diverse product offerings.

CPI was founded in 1982 to market a single brand of hand cleaner--Clean Plus Hand Soap. In 1987, CPI purchased the toll manufacturer that had been producing the soap and moved the manufacturing operation to West Concord. CPI’s chemical division has since grown to become a manufacturing and distribution firm serving national and international markets.

★ ★ ★ ★ ★ AWARD-WINNING

# MINNESOTA BIOECONOMY COMPETES ON

BY DAN

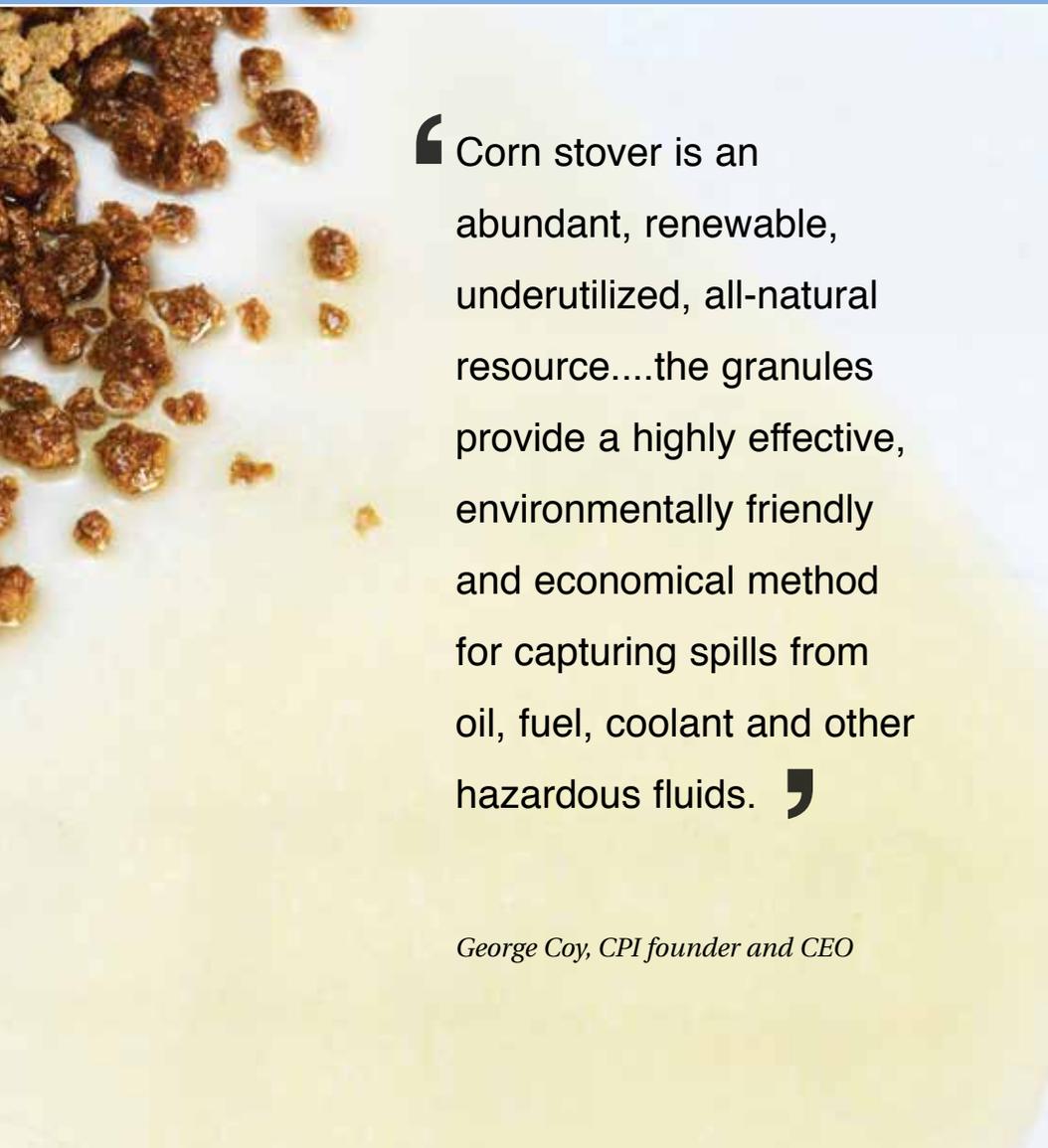


PHOTOS BY ROLF HAGBERG



# BIOMASS-BASED COMPANY TAKES WORLD STAGE

LEMKER



“Corn stover is an abundant, renewable, underutilized, all-natural resource....the granules provide a highly effective, environmentally friendly and economical method for capturing spills from oil, fuel, coolant and other hazardous fluids.”

*George Coy, CPI founder and CEO*



In 1991, CPI founded an auto parts division. CPI developed a line of starter and alternator repair kits under the Victory Lap Brand. The kits are designed for and marketed to do-it-yourself customers through auto parts distributors, retail and mass-merchandise channels.

CPI later researched and developed a line of cleaning products to remove modern urethane-based adhesive used in auto glass installations. The launch of these products was so successful that CPI now supplies other products for auto glass installers and created a glass division.

CPI also markets high quality, FDA-certified medical-grade gloves to the dental, daycare and emergency medical services and corrections markets.

## ADDING ABSORBENTS

In 2003, CPI acquired a license from the University of Minnesota to manufacture and market an oil absorbent pad made from corn stalks. The original corn stalk mat had been developed with assistance from AURI and the Natural Resources Research Institute. The absorbent mat hit the market, but the initial company couldn't translate the technology into a successful business. CPI acquired the technology and began mat production under the brand Drip Trap®.

Shortly after the pad's launch, customers asked for a granular absorbent with many of the same performance, disposal and 'green' characteristics of the Drip Trap® absorbent pad. CPI conducted feasibility studies in partnership with the University of Minnesota – Duluth and AURI to develop a granular product. After identifying a process similar to another, which makes taconite pellets, CPI invested in some large-scale equipment to begin producing the granules. But the system didn't work on larger scale.

“Scale-up was non-linear,” Matt Coy says.

As many innovative companies do, CPI relied on ingenuity and built their own system to make the granules. Now four years after they were originally introduced, demand for the Drip Trap® Granules is strong and growing. Matt Coy says CPI distributes about two truckloads a month of the bagged, granulated absorbent.

“We're progressing into larger production and are looking to add shifts. That's a good thing,” Matt Coy says. “We can hardly pick up the phone and take orders right now.”

George Coy says the Drip Trap® Granules are very popular with heavy industry and even aviation. A major domestic airline uses the granules in their aircraft repair facilities.

Another of CPI's absorbent products is also a hit with airports. Speedsorb® is a loose, bagged, biodegradable product made from corn stover. Speedsorb contains both fines and longer fibers which are especially effective in quickly absorbing leaks, including aviation fuel spills. George Coy says CPI supplies the Metropolitan Airports Commission (MAC), which oversees the Minneapolis/St. Paul International airport, with the fast-acting absorbent. “The MAC was very specific about what they wanted,” George Coy says.

“We recognized that what they were buying wasn't very effective. We knew we could make a product that worked at their price point and it would be better than what they were using.”

“Having a bio-based product is part of their specification, but their number one concern is to stop spills fast since the Minnesota River is very close,” Matt Coy adds.

Matt Coy says CPI is completing their first contract with the MAC and the company hopes to continue supplying Speedsorb for years to come.

## NEXT GENERATION

AURI Senior Scientist for Co-Products Alan Doering worked with CPI years ago developing the proof of concept for their granular process. Given CPI's 35-year history, Doering says it's no surprise that CPI is actively investigating the development of new ag-based products.

“Clean Plus, Inc., is very innovative and they have a long history that shows it,” Doering says. “It's in their DNA.”

AURI is currently working with CPI on additional absorbent forms and blends as well as a potential product for the pet industry. Doering says because of the company's track record of developing and launching new lines, CPI is well positioned to add additional ag-based products.

“They have the distribution channels, which is key,” says Doering. “They can move new products into the marketplace fairly quickly because they're already in the arena.”

All of the CPI absorbent products are 100 percent biobased certified. The Drip Trap Granules also qualify as a Bio-Preferred Product for government purchase. With consumers increasingly focused on biobased products, Doering says CPI is positioned for success.

“We see continued interest in biobased products and it's largely consumer driven, just as it is with food products,” Doering says. “Consumers are looking for more sustainable products and companies like CPI are out there trying to give consumers what they want.”

Being innovative sometimes comes without a roadmap. Matt Coy says CPI has found themselves in that position as they work to develop new products.

“No one has done this before, so the learning curve is steep,” Matt Coy says. “We're getting better, we're adding efficiency and getting more productive.”

# ENCOURAGING *Innovation*

R&D Tax Credit Benefits Entrepreneurs and Small Businesses



BY AURI

Chances are you're familiar with the federal research and development (R&D) tax credit but thought it was a benefit reserved only for the big players – corporations with revenues in the hundreds of millions and up. Not so! Thanks to recent enhancements in the 35-year-old program, it deserves a re-visit, particularly since a company that qualifies can get up to 9.1 percent of its annual eligible research costs applied dollar for dollar against its federal income tax liability – and likely something similar against what it owes the state (each state is different). Also, this credit is over and above any tax deduction for R&D expenses. Add the retroactive and carry-forward provisions, and the credit starts to look very attractive.

## ◆ What happened?

In late 2015, The Protecting Americans from Tax Hikes Act (“PATH” Act) made the federal R&D tax credit permanent, which removed uncertainty as to whether the credit would be available to claim. The PATH Act also added two new provisions to make it more accessible to smaller businesses. First of all, eligible start-ups with less than \$5 million in gross receipts can now apply up to \$250,000 of their R&D tax credit against their payroll taxes. So, even a start up with minimal or no tax liability can get funds to continue engaging in qualified activities. Secondly, pass-through entities – like S Corporations – with \$50 million or less in gross receipts can apply their R&D tax credit against any Alternative Minimum Tax (AMT) liability.

## ◆ What are those “qualified activities”?

You won't get too far into the R&D tax credit without encountering “The Four-Part Test.” Basically, your activity must:

1. Be intended to develop or improve a product or process; e.g., its functionality, performance, quality or reliability. Or, it has to reduce its cost.
2. Endeavor to eliminate or reduce a technical uncertainty about a product or process.
3. Evaluate alternatives, including prototyping, testing, modeling and simulation.
4. Be technological in nature; i.e., it must rely on hard sciences like engineering, physics, chemistry, biology or computer science. Marketing and marketing research activities do not qualify.

John Madsen of Black Line Group, a Plymouth, MN, firm specializing in helping companies navigate the tax credit, points out the spirit of the credit is to encourage innovation and mitigate a company's exposure as it ventures into new, uncharted territory.

“Companies that qualify for the credit aren't required to demonstrate success,” he says. “They need to document *how* they propose to reach their goal, not whether or not they *can* or *did* reach it. This is critical to the program: The intent is to encourage risk-taking and discovery that will make American companies more competitive, and the tax credit can eliminate a good portion of the financial risk in going down that path. The tax savings are intended to be reinvested back into the business – to help it grow faster, be more profitable and compete globally.”

## ◆ What are the qualifying expenses?

Amounts paid for salaries, supplies, contract research and computer leasing all could qualify for the credit. Salaries paid to employees performing the aforementioned qualifying activities are generally the largest part of an R&D tax credit claim.

## ◆ Retroactive claims and credit carry forward

Companies also can file amended returns and claim the credit for the three previous tax years (possibly more, if the company had losses during that time). Also, if you have no tax liability but are engaging in qualified activities, you can file a claim that carries forward to offset tax on future profit – for up to 20 years. This puts money back in the companies' coffers to continue development and research and creates value for a start-up that might be operating at a loss. Studies show 70 percent of credit dollars are used to fund further R&D and pay the salaries of those engaged in it.



## ◆ The local angle

Historically, there was no question it was the big players who benefitted from the R&D tax credit. A 2017 Evaluation Report from the Office of the Legislative Auditor of the State of Minnesota acknowledged the state's version of the credit was positive for business, but its authors also weren't afraid to offer up a few recommendations that would likely make it more accessible to a wider group of companies.

First, it noted most of the Minnesota research tax credits go to C corporations. From 2010 through 2014, C corporations claimed 81 percent of the credits. In 2014, the most recent year for which complete data are available, C corporations claimed \$34 million in research tax credit, while shareholders in S corporations and individual partners in partnerships claimed \$16 million.

The largest 20 percent of C corporations (as measured by national sales) received two-thirds of the tax credit received by all C corporations claiming the credit in the years between 2010 and 2014. Among C corporations, the manufacturing industry has claimed the largest share – 65 percent – of the tax credit.

The report suggests this big-company bias may be due in large part to what the report calls the “limited guidance the state has provided to help taxpayers understand the documentation necessary to claim and substantiate the credit.” For one, it said the Department of Revenue should provide additional and more specific information to taxpayers about the documentation needed to substantiate claims – perhaps in the form of online tutorials and examples of acceptable documentation for substantiating the credit.

It's also very important to note these findings are for 2014 – before passage of the aforementioned PATH Act that makes the credit more accessible to smaller companies.



## ◆ Should you take a closer look?

That question will elicit an enthusiastic “yes” from Kurt Muehler, CFO at AGCO-Amity JV, LLC, in Wahpeton, N.D. The company's 125 employees manufacture agricultural implements and for several years, AGCO-Amity has taken the credit for expenditures related to new-product development.

“The benefit is substantial, and we use the credit dollars to fund research and development for future projects,” he says. “Any company of any size that has R&D expenditures should look into it.”

Muehler suggests the first step is to have a discussion with a certified public accountant (CPA) or with someone at a firm that specializes in the R&D credit. He also notes that in the case of AGCO-Amity, the dreaded documentation requirements aren't bad at all.

“We track the hours and costs associated with our projects, anyway,” he continued. “And that can translate very easily into acceptable documentation of labor costs and expenditures that qualify for the credit.”

While Muehler encourages a company of any size to explore whether to pursue the credit, some others suggest it might make more sense to start exploring the R&D tax credit applicability when the company has reached at least \$5 million in revenue, has 25 or more employees and is profitable. But they acknowledge this is not a hard and fast rule as each company's situation is unique and there could certainly be opportunities for smaller entities.

## ◆ Want to know more? Here's the first thing you should do.

Whoever first uttered “the devil is in the details,” may have been reacting to the R&D tax credit. Unfortunately, despite the changes that make it more accessible to smaller businesses, experts estimate claiming the credit remains one of the most challenging provisions of the tax code. As Muehler suggested, the thing to do is get help.

Jeff Holmberg, a business consulting services manager at Froehling Anderson in Minneapolis, can assess your project or process, determine its viability for a tax credit and advise you on how to proceed.

“Anyone who's working with AURI to develop a product may be an excellent candidate for the tax credit,” Holmberg says. “Some of the ‘rules’ about revenue and staff size can be useful, but it's all relative: A smaller tax credit may be a boon to a smaller company, so it's probably not a bad idea to give it a look. The benefits can be significant.”

## ◆ What will it cost to learn more?

Some firms might have minimum revenue or other requirements, but many companies will do an initial consultation at no cost. They'll offer a high-level assessment to determine whether it's worth continuing. If it is, their fees will be clear upfront on either a fixed rate or a percentage of the credit realized.

AURI executive director Shannon Schlecht hopes Minnesota's agricultural entrepreneurs will give the tax credit a closer look to see if can benefit their bottom line.

“AURI clients are all about innovation, and the R&D tax credit is another tool to support the eventual commercialization of innovative ideas,” he says. “If companies and entrepreneurs can use this tool to offset costs to help foster additional research, it could spur new creativity and innovation that leads them to the next great agricultural product or process.”



BLG is a nationwide professional services firm comprised of industry experts with a passion to help improve the value of businesses.

*To learn more about the R&D tax credit potential to your business, contact John Madsen at 763-746-1265.*



Froehling Anderson is a full-service CPA and business consulting firm with a specialty in R&D tax credits.

*To get help navigating the complex R&D tax credit calculations and documentation call 952-979-3100.*

# Looking to a “Dryer” Future

BY AL DOERING

Moisture content is an ongoing issue in agriculture. Many wet biomass feedstocks generally have low value due to the high cost of thermally removing water to utilize the biomass. AURI works with a variety of these biomass feedstocks that contain high moisture contents such as digester solids, food processing waste, and even a variety of crop residues.

The high moisture content reduces feedstocks' potential value. Creating drier materials opens markets for combustion or gasification of the feedstocks. Other possibilities for drier biomass include pelleting material for feed or slow release fertilizer or use as ground cover. At the very least, a farmer using a drier product for feed or land application would truck more material and less water.

AURI focused heavily on drying technologies in the past because it directly affected the feasibility to move high moisture coproduct into value-added markets. Two primary drying methods are available. One is a mechanical system where moisture is physically removed using centrifuges or dewatering presses. The second type of dryer uses a thermal process, as in rotor drum dryers, spray driers, and others which utilize a heat source.

Styles and features of dryers vary greatly based on the quantity and need for drying. Custom dryers can be designed for everything from food processing, textiles, feedstocks and manure.

Interest is growing in a variety of new technologies to dry high moisture feedstocks utilizing mechanical, thermal, or a combination of both methods. Some of the newer, large scale drying technologies include infrared, microwave and radio frequency drying which could provide a cost-effective method to dry specific materials on a scale much greater than previously possible. Many new dryers entering the industrial market utilize a combination of mechanical and thermal drying which greatly improves the efficiency of the process.

AURI is currently focusing on purchasing a new drying system for its Coproducts Pilot Lab located in Waseca. According to AURI Senior Scientist for Coproducts, Al Doering, “We plan to obtain a drying system which can provide detailed information back to the clients we serve. Important information that today's dryers can provide includes efficiency which is often documented as energy required to evaporate one pound of moisture. Additionally, dryers can also provide more data such as energy usage to operate, product throughput and relationships between drying temperature and product quality obtained after drying.”

Looking to the future, drying will continue to play an important role in agriculture. Currently, nearly every farm and elevator has a dryer on site to dry wet grain in the Fall for proper storage. Feed and food processing plants operate dryers on a daily basis as drying is critical for product stabilization and shelf life. Drying will always be a critical consideration for agriculture.



Interest is growing in a variety of new technologies to dry high moisture feedstocks utilizing mechanical, thermal, or a combination of both methods. Some of the newer, large scale drying technologies include infrared, microwave and radio frequency drying

## 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.*



### Blockchain - Australia

Agriculture and food are ideal domains to exploit the potential of distributed ledgers or blockchain. This emerging technology is most commonly associated with cryptocurrencies such as Bitcoin, but it can be used equally well in agriculture for decentralized and transactional data-sharing across a large network of untested participants. This technology enables new forms of distributed systems and agreements and captures transactions permanently, without relying on a trusted central authority. Blockchain technology allows information to be carried along a supply chain; to match product to processing demands; to enable traceability, verify provenance and monitor quality and safety. In the future, a Tokyo restaurant could use blockchain technology to verify that a cut of wagyu beef originated from a particular farm in Tasmania. Through blockchain, producers will be able to escape the trap of commodity production, where products cannot attract premium prices. Blockchain will open up ways for farmers to put their products into differentiated markets by allowing verification of provenance and other attributes. It will meet the demand by consumers for better quality assurance of their food.

[blog.csiro.au](http://blog.csiro.au)



### Spinach protein and blackberry dye give juice to biohybrid solar cells

Vanderbilt researchers discovered that berries can increase the voltage of spinach-derived biohybrid solar cells by up to a factor of 20.

The interdisciplinary team discovered that combining a natural dye from blackberries with photosynthetic proteins extracted from spinach leaves creates a device that can produce vastly more voltage than a solar cell made from spinach protein alone.

Plants convert solar energy to chemical energy at a global rate of 90 terawatts through photosynthesis. Scientists at Vanderbilt University discovered that combining a natural dye from blackberries with photosynthetic proteins extracted from spinach leaves creates a device that can produce vastly more voltage than a solar cell made from spinach protein alone. Biohybrid solar cells that incorporate natural materials can become a cost-effective source of electricity if their energy is increased. The technology is at an early stage, comparable to silicon solar cells of 30 to 40 years ago that were limited to powering electronic watches and calculators.

[news.vanderbilt.edu](http://news.vanderbilt.edu)

## 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 is the percentage of U.S. farms that market foods locally through farmers markets and food hubs?

- a. 2 percent
- b. 4 percent
- c. 8 percent
- d. 10 percent

Answer: c

### Renewable Energy

What process do facilities use to convert raw fat into biodiesel

- a. Transesterification
- b. Glycerol Conversion
- c. Ethanolization

Answer: a

### Coproducts

Which of the following are examples of cover crops?

- a. Catch crop
- b. Smother crop
- c. Green manure
- d. All of the above

Answer: d

### Biobased Products

Toy company Lego announced it would start making pieces made from plant-based plastic starting this year made from which of the following:

- a. Soy
- b. Hemp
- c. Sugar Cane
- d. Corn

Answer: c

## 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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## Contact Us

[auri.org](http://auri.org)

#### Crookston

510 County Road 71  
Suite 120  
Crookston, MN 56716  
800.279.5010

#### St. Paul

U of M Biological  
Sciences Center

1445 Gortner Avenue  
(physical address)

1475 Gortner Avenue  
(mailing address)

St. Paul, MN 55108  
612.624.6055

#### Marshall

1501 State Street  
Marshall, MN 56258  
507.537.7440

#### Waseca

PO Box 251  
Waseca, MN 56093  
507.835.8990

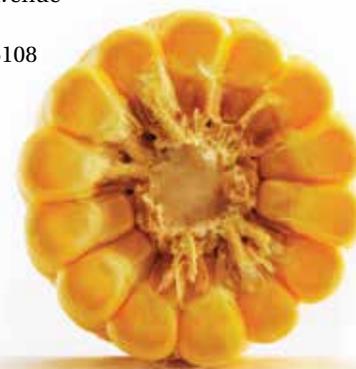


PHOTO BY ROLF HAGBERG

## ABOUT AG INNOVATION NEWS

Erik Evans, managing editor  
Rolf Hagberg, photography  
Design by,



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Address correspondence or subscription requests to:

*Ag Innovation News*  
PO Box 251  
Waseca MN 56093  
507.835.8990  
[news@auri.org](mailto:news@auri.org)



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# Join AURI at Farmfest

BY AURI

This August AURI will again take part in one of the state's largest agricultural events, the 2018 Minnesota Farmfest. From August 7-9, AURI is hosting a group of clients, and partner organizations who represent the full spectrum of value-added agriculture in Minnesota, making this a great opportunity to learn about the latest developments in food, coproducts, renewable energy and biobased products. Farmfest, which connects more than 30,000 attendees with over 500 local & national companies for three days of education, political forums, field demonstrations, and networking, is one of the highest profile events of its kind. The latest technological advances in the farming industry premier there, and each year brings exciting news and events for anyone in the agricultural industry!

AURI uses this event as an opportunity for clients to promote their products and services to a large audience, share information about industry trends and expose attendees to new innovations in value-added agriculture. It's also a good way to introduce the organization to entrepreneurs and small business owners who could benefit from AURI's technical and commercialization assistance.

For Farmfest attendees, the AURI tent offers delicious samples from it's most innovative food clients, demonstrations of value-added technologies benefitting Minnesota farms and farmers, as well as trivia contests and prizes! This is sure to be a great event for everyone in attendance, so be sure to stop by AURI's tent, located at space 612, right across from the Wick Buildings Farmfest Center.



**AUGUST**

**7-9**

Visit AURI's Farmfest booth from August 7-9, located at space 612 across from the Wick Buildings Farmfest Center.

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