



Ag Innovation News

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Bright days in sunflower oil market

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PHOTO BY LISA SHERWOOD PHOTOGRAPHY

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PHOTOS BY ROLF HAGBERG



SAVORY

sauces



Garden-fresh ingredients and spices are key to success

BY JONATHAN EISENTHAL

Mark Porisch never dreamed that when he reached 60 he'd be making Louisiana-style hot sauces for a living, but he thinks that one of these days his creations, sold under the brand Lucky's Popcorn Dressing, might cover all the bills. Until then, he's having a lot of fun helping a steadily growing Minnesota audience discover the joy of bringing the heat!

The story began almost two decades ago when Porisch started making hot sauces for friends on his co-ed volleyball team. One couple on the team came back from a trip to Mexico and asked Porisch if he had ever put Tabasco sauce on popcorn?

"We all liked spicy wings, and the question came up, 'How do you make hot sauce?'" Porisch recalls. He decided to experiment with different recipes using ingredients grown in his own garden.

When he'd perfected his recipe, the team became his first focus group. Pretty quickly they were telling him, "We'd buy this in a store."

The volleyball players urged Porisch to market his hot sauce to the bar that sponsored the team. Once again, the spicy flavorings were a hit. At this same bar, the team members discovered a delicious honey mustard offered to the patrons as a condiment for wings and other food. They liked the honey mustard so well they started taking it home to use on sandwiches during the week. When the bar changed suppliers, the new mustard fell flat, and Porisch's teammates asked him to come up with honey mustard like the one they knew and loved. Once again, he scored a hit.

Porisch credits his extremely patient mother for his love of cooking. She introduced him to the kitchen when he was a child. The lifelong interest and hobby became something more when he was laid off from his job with a Japanese electronics firm in 2008.

"I thought if my friends are willing to pay for my hot sauce, then maybe other people would, too," says Porisch.





WORD OF MOUTH CONNECTS ENTREPRENEUR TO AURI SERVICES

Porisch reached a point where all his friends were willing to buy his mouthwatering concoctions, but he didn't know the next step. What he did know was that he needed to get nutritional labeling in order to offer a food product to the public. He looked online and found various services that could produce the necessary information, but at a cost ranging into hundreds of dollars.

When he was at the local farmers market, Porisch met a man from the Minnesota Department of Agriculture who told him about AURI's Food Lab in Crookston, where Minnesota entrepreneurs are assisted for free with items needed to meet Food and Drug Administration requirements such as labeling, nutritional panels, and the weights and aspects of packaging.

AURI Senior Scientist of Food and Nutrition Charan Wadhawan assisted Porisch in standardizing recipes, testing and creating camera-ready nutritional facts to be in compliance with FDA's regulations.

"AURI research is an invaluable tool for startups like mine," says Porisch. "I think this is an excellent use of Minnesota tax dollars, though I guess you could say I am biased. AURI is a great resource for folks like me, doing what I am trying to do, trying to get off the ground without larger cash outlays."

SALTING AWAY MORE DOUGH WITH A SODIUM ANALYSIS

One key nutritional component that every food producer must test is sodium content. Lucky's Popcorn Dressing hot sauces and honey mustards arrived at AURI's Marshall lab and were taken in hand by analytical chemist Ranae Jorgenson.

To determine the amount of sodium, a sample of the popcorn dressing is dried

and turned into ash in a lab furnace at 550 degrees centigrade. The resulting ash is prepared for sodium analysis by dissolving in concentrated nitric acid. The amount of sodium is determined using an instrument called an Atomic Absorption Spectrophotometer.

This delivers a result of milligrams of sodium per gram of product, and that information is sent along to Wadhawan at the Crookston lab and included in the information for the nutritional panel that will go on the product label.

Jorgenson has worked for AURI for the past seven years and enjoys the wide variety of testing handled at AURI's Marshall lab—everything from testing food products like Lucky's Popcorn Dressing to coproducts for agriculture-based industries like ethanol and biodiesel. The diversity of value-added agricultural business helps to make agriculture one of Minnesota's strongest economic sectors.

FINDING SUCCESS

Porisch found that there was indeed a market for his products—so much so that he's had to give up the gardening aspect and now sources his vegetables and herbs with local growers. Lucky's Popcorn Dressing has expanded into a line of five flavors of honey mustard, and 10 flavors of Louisiana-style hot sauce. Not only do the bottles fly off the shelf at his farmers' market stands, but a handful of Twin Cities supermarket venues now also carry his products, including Kowalski's, Whole Foods and Coastal Seafoods.

"Lucky's goes on steak and seafood and just about anything, even popcorn, so it's the one sauce you'll be constantly reaching into the refrigerator door for," says Porisch. "My recipes are gluten- and corn syrup-free for people who have sensitivities and allergies, so everyone can enjoy them."

He sees Lucky's Popcorn Dressing fitting in with the surge of interest in locally-produced food.

"You see that [interest in local food] in the expansion of the local craft brewing, and in all the restaurants that promote local ingredients in their menu," Porisch believes. "Many people are realizing that if you have a chance to talk to the person who is

producing your lettuce or your breakfast cereal, you can find out how they do it and why they do it. People like that connection."

Recently, Porisch earned awards at the Cajun Hot Sauce Festival in New Iberia, La. He won first place for Best Jalapeno Hot Sauce and second place for Best Louisiana Style Hot Sauce. Both sauces are from peppers grown in Minnesota.

In Porisch's first year in business, he had a couple thousand dollars in sales, which has grown over the past five years into enough to support his house and car payments. Looking ahead, he'll have to decide how much to grow the business and whether to bring on full-time help, but for now he's enjoying opening up taste buds, one customer at a time.

"This is a career path I began late in life—if I knew I was going to have this much fun, I would have started this a lot earlier," says Porisch. ■



Entrepreneur Mark Porisch's variety of sauces are a hit with consumers.



AURi and Lucky's

Idea to reality:

Mark Porisch had some great recipes for unique sauces, but needed help with labeling and nutritional panels to help make his idea reality.

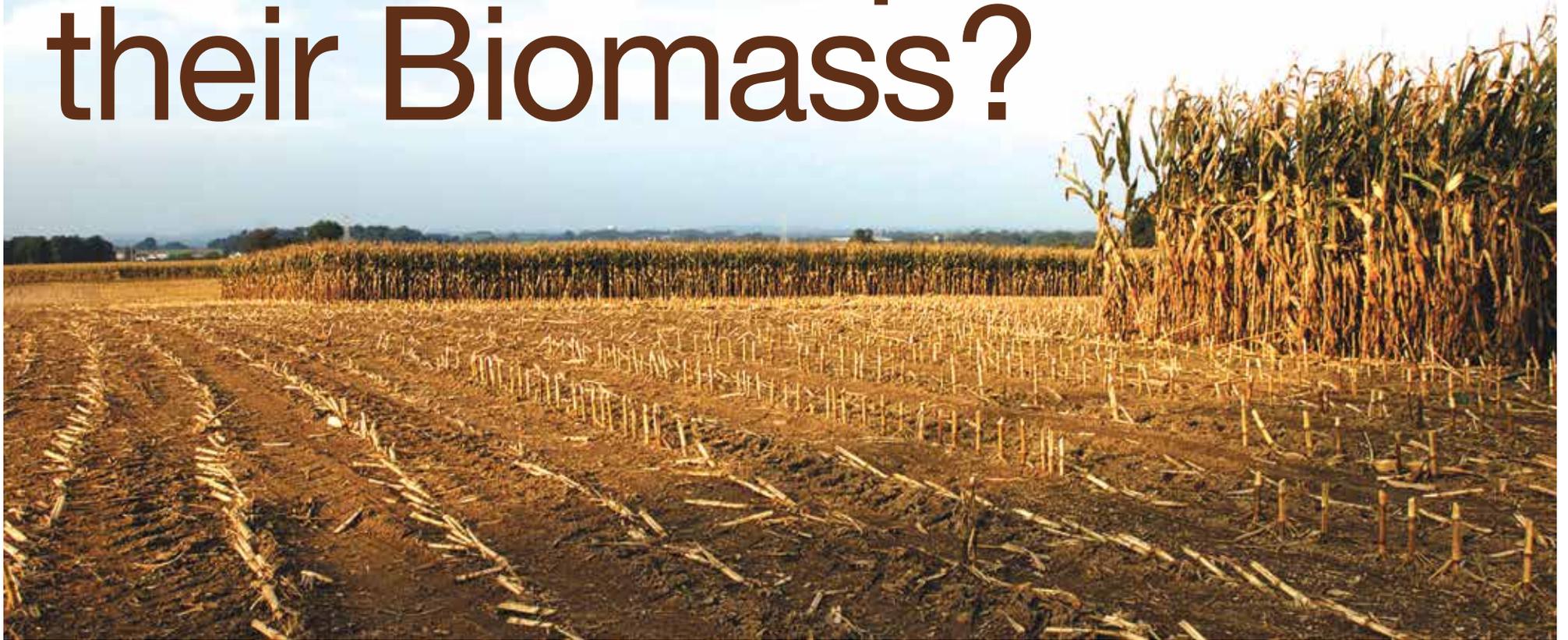
AURi's role:

AURi chemist Ranae Jorgenson conducted tests to provide important nutritional information, and scientist Charan Wadhawan assisted in labeling compliance and standardizing recipes.

Outcomes:

Porisch's Lucky's Popcorn Dressing has expanded into a line of five flavors of honey mustard, and 10 flavors of Louisiana-style hot sauce. His sauces are available at several farmers markets and a handful of Twin Cities supermarket venues, including Kowalski's, Whole Foods and Coastal Seafoods. Recently, Porisch earned awards at the Cajun Hot Sauce Festival in New Iberia, La. He won first place for Best Jalapeno Hot Sauce and second place for Best Louisiana Style Hot Sauce.

Will farmers part with their Biomass?



A new statewide survey measures grower interest in harvesting corn stover

BY LIZ MORRISON

Minnesota farmers produce 33 million tons of corn residue a year.

But will they part with it? And if so, at what price?

These are two of the questions farmers were asked in a recent survey aimed at identifying places that could support new biomass processing businesses.

The survey shows that 40 percent of Minnesota growers might be willing to sell crop residue from their fields — if the price is high enough. Another 40 percent are on the fence about harvesting biomass, and two in 10 farmers wouldn't consider it.

Growers' overwhelming concern? The effects of biomass removal on soil quality, the survey found.

The study concludes that several regions of the state could supply enough corn residue to support large biomass processing facilities. However, securing a sustainable supply of corn stover will be more of a challenge than many have assumed, says survey director Joel Tallaksen, Ph.D., a renewable energy scientist at the University of Minnesota West Central Research and Outreach Center in Morris.

"Overall, the survey found many producers were undecided or not interested in selling agricultural biomass at this time."

Knowledge and cost are key factors

Past surveys have mapped how much biomass farmers generate — but not how much they'd be willing to remove, says Alan Doering, AURI coproducts scientist. For biomass processors, the real question is, "What can you actually get your hands on? It can be a struggle, and we've seen that."

In 2008, for example, the University of Minnesota in Morris approached local farmers to supply corn stover for the college's new biomass gasification plant. Based on USDA and DOE estimates, "I was expecting an overwhelming amount of interest," says Tallaksen. "We expected that many corn producers would be willing to supply corn stover at an average price of less than \$50/ton."

That assumption turned out to be overly optimistic. Few farmers attended informational meetings, and those who bid for contracts typically wanted \$70 to \$80/ton, delivered.

"It was a wake-up call," says Tallaksen. "We needed a better understanding of farmers' willingness to supply stover."

That prompted a formal survey last summer to measure growers' interest. The study was sponsored by AURI, the Minnesota Corn Research & Promotion Council and the University of Minnesota. (To read the full report, go to auri.org/help/research.)

First solid data

The new study provides the first solid, statewide data on biomass availability, says Chuck DeGrote, a grain and livestock producer from Clara City, Minn. DeGrote serves on the Minnesota Corn Growers Association board of directors and provided feedback on the survey. "We wanted to get a feel for how growers would look at this."

What really stands out, he says, "is how concerned growers are about the quality of their land, and preserving and improving it."

The Minnesota Corn Growers are very interested in developing corn stover markets, which would offer farmers another commodity to sell, DeGrote says. Yet, producers are rightly wary of removing too much crop residue, he adds, so

clear production and harvesting guidelines will be needed to help them protect the soil. The University of Minnesota and the USDA Agricultural Research Service are working on those problems now.

Given growers' profit expectations and the current cost of biomass collection and delivery, the economics look better for higher-value biomass products, such as corn cobs, says Michael Sparby, AURI senior project strategist. Sparby noted that a previous study done in 2009 found that the corn cob has less value as a nutrient for the soil than the stocks and stovers but is still effective as biomass.

Best availability

A model created from the survey data shows that south central and southwest Minnesota are the best bets for furnishing large amounts of biomass — despite relatively little interest from the region's farmers.

Southern Minnesota produces such big corn crops that collecting 500,000 tons of stover within a 70-mile radius of a large facility "could be accomplished, while maintaining soil quality and preventing erosion," Tallaksen says, "as long as best soil management practices were used."

That said, biomass developers will need to do a lot of groundwork to assure adequate feedstock supplies, Tallaksen says. "The supply chain plan is a very crucial step."

The study will serve as a guideline supporting many of the agricultural biomass projects that AURI provides assistance to, says Doering. "This report can be used to help identify potential quantities of biomass that can be obtained as well as optimum locations in Minnesota to construct a biomass related plant." ■

Among the survey's findings:

40 percent of farmers said they were interested or very interested in selling corn stover for biomass projects.

21 percent were unwilling to sell biomass. Dairy farmers, in particular, were not interested, due to workloads and their own need for corn stover for livestock feed and bedding.

38 percent were undecided about selling biomass.

More than two-thirds said biomass harvesting would reduce soil organic matter, a major component of soil productivity.

The effects of biomass removal on soil quality mattered more to growers than the chance to earn extra revenue.

Nearly half of farmers said they would consider reducing tillage or adopting other soil conservation practices, in order to make biomass harvesting sustainable. However, very few were willing to eliminate tillage, which might be the only way to make biomass removal sustainable in many situations.

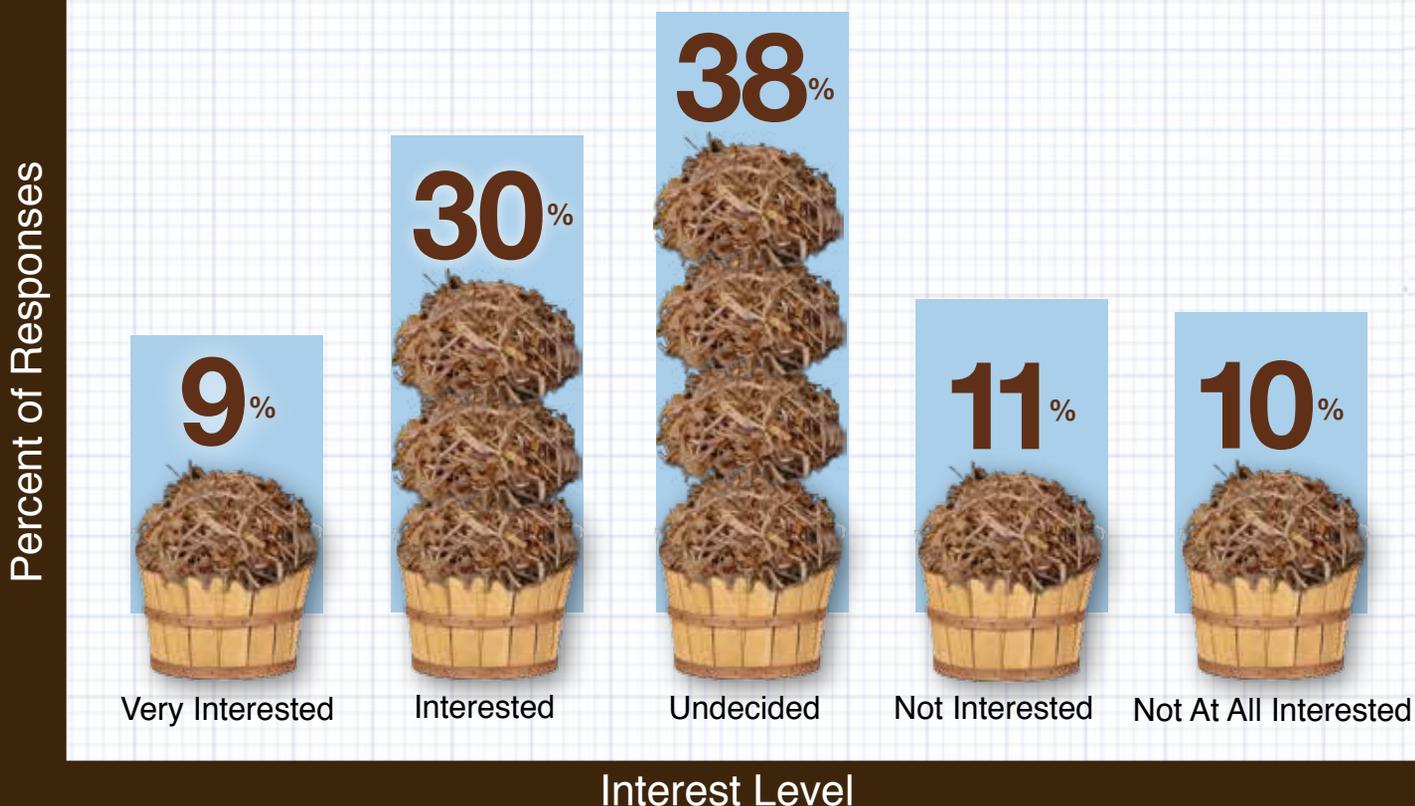
Farmers in northwest Minnesota perceived fewer negative effects of biomass harvesting on soil quality than growers in the southern third of Minnesota. Northern growers also expressed more interest in selling biomass than southern Minnesota farmers.

A minimum net profit of \$40 to \$50/acre would be necessary to interest at least half of the producers who said they were willing to sell corn stover.

Corn prices affect growers' willingness to harvest stover. Interest increases as corn prices drop below \$4 per bushel.

How many farmers would sell biomass?

About 40% of farmers who responded to a statewide survey last summer were interested or very interested in selling biomass from lands they manage; 20% had little or no interest. The largest group was undecided.



AURI and Partners

Idea to reality:

Agricultural biomass is an abundant renewable resource, but there was little hard data on how many Minnesota farmers would be willing to remove crop residues from their land.

AURI's role:

AURI supported a statewide survey, which was carried out by the University of Minnesota West Central Research and Outreach Center and evaluated growers' willingness to sell corn stover, asked for insights into their decision-making and identified where biomass supplies were most available.

Outcomes:

The survey will help ag biomass project developers understand supply chain issues and identify where they are most likely to find willing biomass suppliers.

Partners:

Minnesota Corn Research & Promotion Council, University of Minnesota West Central Research and Outreach Center, University of Minnesota Initiative for Renewable Energy and The Environment

Minnesota-made sunflower

Health benefits of cold-pressed oil are a big draw

BY JONATHAN EISENTHAL

Hundreds of people dropped by Tom Smude's booth at the 2013 Minnesota Sportsmen's Show in St. Paul, many of them already loyal customers of his brand of cold-pressed, high oleic sunflower oil.

"Most of them told me they love the oil when they're cooking fish," said Smude. "At other venues, most of the people will say they are buying our oil to use in salad dressing, cooking or baking."

Smude produces the oil at his farm in Pierz, Minn. A sign that his business has hit its stride is his recent purchase of a 22,000 square-foot warehouse space, where his four part-time employees can press, bottle and ship the oil. The new space will also allow Smude's to expand its product line. Next in development is Smude's Granola.

Sunflower oil has among the highest levels of monounsaturated fat available in a food oil—10 percent higher than olive oil, according to Smude. This healthy fat, which contains fatty acids known as omegas, is known to help improve cholesterol levels. And a single serving of sunflower oil offers 29 percent of a person's daily value of vitamin E.



"Taste is a key factor," says Smude. "Our oil has a real light, buttery flavor to it. The nutritional analysis AURI did for us came out perfect for healthfulness, and it's 20 times tastier than any other oil on the market. I might be a little biased."

AURI has conducted several projects with Smude Oils to help with initial market development and nutritional analysis and labeling.

"AURI is a great starting point for a business like this," says Smude. "It is so hard to break in and do this kind of

"With the rising cost of health care, the interest in healthful foods will only continue to grow."

*AURI Senior Scientist of Food and Nutrition
Charan Wadhawan*

thing, especially with food products—that's one of their real strengths at AURI."

Smude became interested in sunflower production as an answer to drought. The hot, dry weather in 2007 took a toll on corn and soybean crops, especially in sandy-soil areas like Central Minnesota. He learned that these hardy sunflower plants could thrive in such adverse conditions.

It's also a crop that fit in well with his existing cattle operation. After pressing the seeds to extract the oil, the leftover meal can be fed to the cattle. Smude continues to grow a portion of the feedstock himself, but also works with neighbors who grow for him—all the seed comes from within a 20-mile radius.



Just as Smude put together the business in 2009, biofuels became a big market. But the friend who sold him the pressing equipment tipped him that food grade oil might be an even more profitable outlet. So Tom went on a trip to the grocery store and discovered a gap in the offerings—olive oil, blended vegetable oil and canola oil were well represented on the shelf, but no sunflower oil.

"The cold-press method sets his product apart from most commercially available oils, which use hexane to chemically extract the oil," says Randy Hilliard, the project manager at AURI who has worked with Smude since 2009.

An expanding market

Smude came up with the most important sales leads himself and has deals with SuperValu and with Classic Provisions in Plymouth. SuperValu distributes Smude's sunflower oil in



oil sees growing market

groceries around the region including Lunds, Byerly's Festival Foods, Coborn's, and some Kowalski's and Cub Foods stores. Classic Provisions distributes 2.5 gallon jugs of sunflower oil to Twin Cities restaurants and food coops.

With Smude's development of its granola product line, Hilliard and AURI Senior Scientist of Food and Nutrition Charan Wadhawan have been able to generate leads for manufacturers who could either take it all the way from raw feedstock to

finished product and others who can take the product once Smude produces it, and the manufacturer would bag it up and label it for sale. Tom is grateful to have all these options to weigh.

A key element in launching any new food product is the nutrition label, and Wadhawan provided the expert analysis for the oil and now for the granola.



"I did the analysis, and I've been doing troubleshooting for Smude's on an ongoing basis," says Wadhawan. She helped with recipes for flavored and infused oils and now that the

granola product is coming along, she has helped with issues like moisture content. Wadhawan considers healthful food both a personal and a professional interest.

"When a trend starts, there are so many businesses that can start up, to offer products and cater to that niche," says Wadhawan, who has an undergraduate degree in nutrition and a Ph.D. in cereal

chemistry. "I have been helping clients develop healthier food for quite a while now...with the rising cost of health care, the interest in healthful foods will only continue to grow."

And now that Smude has had several breakthroughs and attracted a growing base of loyal customers, he wants to turn around and help other local entrepreneurs achieve that first big success. He's helping to organize a Minnesota-Made products fundraising catalog—to give 25 small companies, with 70 or so products, a means to offer their products for sale in school fundraiser programs.

"A lot of people have contributed to our success, and I feel like this is a chance to give back," says Smude. ■

Learn more at smudeoil.com.



AURI and Smude's Sunflower Oil

Idea to reality:

After the hot, dry summer of 2007 took a toll on Tom Smude's corn and soybean crops, he learned that hardy sunflower plants could thrive in such adverse conditions, and he began to explore the idea of producing sunflower oil.

AURI's role:

Nutritional analysis, product development, troubleshooting and innovation networking

Outcomes:

Today, Smude's is on shelves in major grocery chains, has a loyal customer base, is expanding its offerings to include granola and employs four part-time staff.

Partners:

Smude Oil received a value-added producer grant from the USDA and also received assistance from the Community Development of Morrison County and the Small Business Development Center in Brainerd.

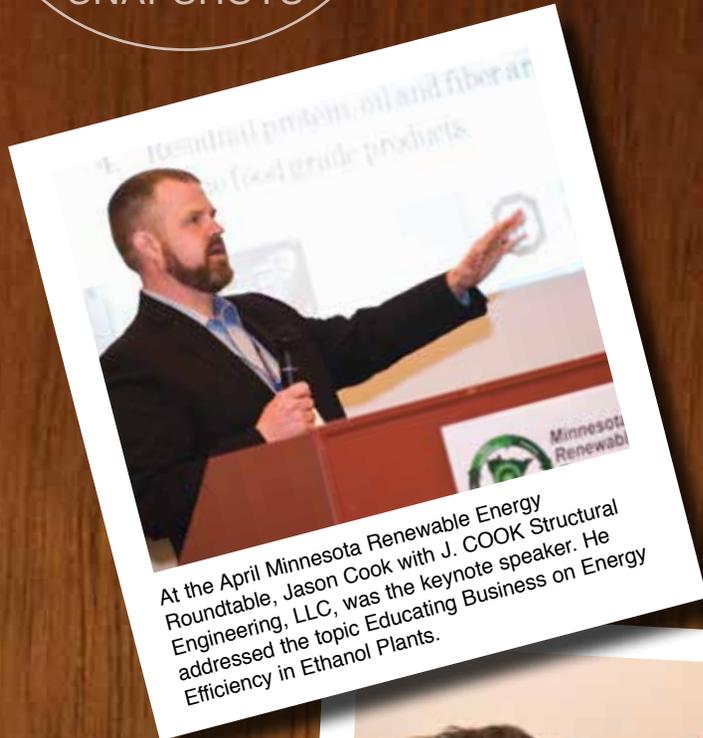


PHOTOS BY LISA SHERWOOD PHOTOGRAPHY

APRIL

Renewable
Energy
Roundtable

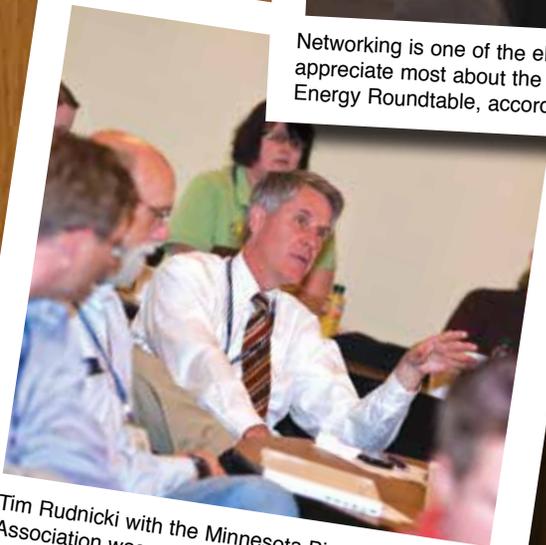
SNAPSHOTS



At the April Minnesota Renewable Energy Roundtable, Jason Cook with J. COOK Structural Engineering, LLC, was the keynote speaker. He addressed the topic Educating Business on Energy Efficiency in Ethanol Plants.



Networking is one of the elements that participants appreciate most about the Minnesota Renewable Energy Roundtable, according to survey respondents.



Tim Rudnicki with the Minnesota Biofuels Association was part of a panel on the state of renewable energy in Minnesota.

PHOTOS BY ROLF HAGBERG



The big squeeze

BY ALAN DOERING,
SENIOR ASSOCIATE SCIENTIST FOR COPRODUCTS

AURI's agricultural coproduct utilization program seeks utilization ideas for plant and animal coproducts that present environmental and economic opportunities. A coproduct is something that is produced together with or left over during the creation of another product; a great example is the dried distillers grains that are produced during the ethanol production process. Coproducts, such as crop residues, agricultural processing by-products and animal manure, can be used in a variety of agricultural products including fertilizers, renewable fuels, animal feeds and more.

Agricultural processing and energy coproducts, such as cannery waste or digester solids, are typically high in moisture. Many wet biomass feedstocks generally have low value due to the high cost of thermally removing water; increasing the value of these materials in the market often requires an economical big squeeze called dewatering.

The goal of AURI's dewatering research, started in 2009, is to identify potential thermal and mechanical drying technologies that can remove water in a cost-effective way, thereby raising the value of these materials. Drier feedstocks would open markets for combustion or gasification of the feedstocks, pelleting material for feed, slow release fertilizer or for use as ground covers. At a minimum, producers or processors using a drier feedstock for feed or land application would be trucking more material and less water.

Recently, AURI, the Northwest Minnesota Foundation and American Crystal Sugar collaborated with PulverDryer USA, Inc., to evaluate the performance of their HydroCell™ technology for dewatering agricultural coproducts. This is one of many various moisture presses entering the market due to their improved water removal efficiency.

Dewatering trials conducted show that the HydroCell™ technology appears to be an efficient method of feasibly dewatering high-moisture coproducts. For this trial, sugar beet tailings and sugar beet pulp were evaluated. A 58.9% liquid extraction was observed in the wet sugar beet tailings and a 44.8% liquid extraction was observed in the wet sugar beet pulp. Although the remaining products still contained 70.5% and 79.2% moisture respectively; the majority of the moisture was removed utilizing mechanical methods. Operational cost assumptions for this technology are estimated to be \$6 per wet ton, including a \$1.50 to \$2.25 per wet ton processing cost.

Dewatering technologies may offer an efficient companion technology to thermal drying, thus increasing the market opportunities for wet feedstocks.

One area of use for these feedstocks is for biomass heating. Biomass refers to any agricultural or forestry product that can be fed into a combustor and burned to generate heat. Biomass can be in bulk form (e.g., straw bales, processing byproducts, wood chips) or densified form (e.g., pucks, pellets, cubes).

For propane users, heating with biomass is a technically and economically feasible option in Minnesota. Minnesota has an adequate supply of biomass; the equipment necessary for its storage, processing and combustion; and the capital, expertise and experience necessary to provide producers an economical alternative for heating applications. ■

From the farm to a face near you

New Minnesota plant may process glycerin for personal care market

BY JONATHAN EISENTHAL

Minnesota farmers plant around seven million acres of soybeans each year, and a major part of the crop's attraction is its value-added products like biodiesel and glycerin that increase the worth of the commodity and create additional revenue streams for processors



Minnesota Soybean Processors (MnSP) in Brewster recently worked with AURI to study whether refining glycerin would be a good fit for their company, which crushes soybeans in order to produce value-added products like soybean meal, soybean oil, biodiesel and crude glycerin. MnSP has historically sold that crude glycerin to the animal feed industry. However, refined glycerin is a much higher value item.

AURI awarded MnSP a cost-share grant in part to hire Bob Carlson, an agribusiness consultant with decades of expertise in oilseed processing and products. His study has encouraged the company to move forward with engineering studies for an \$8-10 million facility.

In addition to the cost-share assistance, AURI's scientists have provided MNSP with analytical services related to analysis of their glycerin as well as to their biodiesel operation.

"Within the Minnesota Soybean Processors board there is a lot of excitement about the idea of adding glycerin refining," says Taryl Anderson, general manager of MnSP.



The first economic analysis finds the refinery will add approximately 20 cents per bushel processed.

"With annual production of 30 million gallons of biodiesel, MnSP can refine 36 million pounds of glycerin and increase their revenues," says Denny Timmerman, the AURI senior project development director who is working with

AURI Senior Project Development Director Denny Timmerman has worked with the Minnesota Soybean Processors on their potential new glycerin refinery.

MnSP. "AURI is charged with finding ways of adding value to agricultural commodities, and this is a nice way of doing that."

Carlson's analysis found that MnSP would realize the best return for its investment by refining glycerin for the manufacturers that use it to produce lotions, soaps, toothpaste and a host of other personal care products, as well as pharmaceuticals and "green" chemicals, such as biobased antifreeze. Among other characteristics, glycerin is slightly sweet and yet doesn't promote tooth decay. The glycerin gives these products their smooth texture.

US manufacturers currently import about half of their refined glycerin needs, and analysts believe the market will grow five percent per year for the foreseeable future.

"We have an aging population, dealing with aging skin and consuming more and more personal care products each year," says Carlson.

The crude glycerin is worth about eight to 10 cents per pound while the refined product goes for anywhere from three to five

times that amount. BASF, Dial soap, Colgate-Palmolive, Procter and Gamble and Dow Chemical are among the major consumers of refined glycerin.

"Cargill and ADM both refine the glycerin that they produce at their biodiesel plants," Carlson says. "This is a logical step in the vertical integration of the business. Soybeans produce soybean oil, which is used to produce biodiesel, of which crude glycerin is a low-value by-product that can be converted to a higher-value refined product."

MSP began crushing soybeans for meal and oil in 2003 and added biodiesel production in 2005. The plant can crush 110,000 bushels of soybeans per day, and between the MSP plant and another company's facility in Fairmont, soybean producers in southwest Minnesota enjoy a premium of \$0.15 to \$0.35 cents thanks to local demand. "AURI is a big value for us, and has been for us since MnSP started up," Anderson says.

"AURI is out there looking for niches for our ag businesses to go into. They are sifting through, developing very useful information for us on an ongoing basis. For a value-added cooperative that's a big help." ■



AURI and Partners

Idea to reality:

Minnesota Soybean Processors wanted to know if a glycerin refinery plant was economically feasible and would add value to the soybeans they crush.

AURI's role:

AURI provided cost-share assistance as well as networking connections to help MnSP hire Bob Carlson, an agribusiness expert who conducted a feasibility analysis.

Outcomes:

The feasibility analysis showed that refining the glycerin that is a byproduct of the soybeans MnSP crushes for biodiesel would increase the value of the glycerin by three to five times.

Partners:

USDA, Minnesota Soybean Growers Research & Promotion Council.



BY TERESA SPAETH
AURI EXECUTIVE DIRECTOR

Leveraging the state's investment in AURI

As the 2013 legislative session came to a close this May, we at AURI were again thankful for the support of so many legislators, commodity groups, higher education organizations and others at the capitol. It was more than 25 years ago that the legislature created AURI. We're pleased that today they still find value in our work and continue to invest in our efforts to drive agriculture innovations from idea to reality in order to create jobs and economic development.

I'd especially like to acknowledge Rep. Jean Wagenius [Minneapolis] and Rep. Jeanne Poppe [Austin], the House ag finance and ag policy chairs, along with Senators David Tomassoni [Chisholm] and Dan Sparks [Austin], the Senate ag finance and ag policy chairs, for allowing us to present in their committees and for listening to our story.

We take this investment from the legislature and Minnesota taxpayers very seriously and look for ways to make the most of every dollar invested in AURI by leveraging the state's funds through matching monies and grants from other organizations in order to have the greatest impact. Our staff is daily looking for ways to grow our collaborations around the upper Midwest. It is essential to our success that all facets of agriculture work together to secure a strong future.

While we continue to provide the excellent service that our clients, partners and the state of Minnesota have come to expect, we look to the future to help create an agricultural strategy that ensures a prosperous future for Minnesota. We are doing that by working with Minnesota's research and promotion councils to identify the highest-priority agriculture

research opportunities. At the same time, AURI staff is working with the renowned Battelle Memorial Institute to identify the capacities and strengths of Minnesota's various agriculture research organizations. Through these two initiatives, AURI is bringing together the right people to do the right research at the right time in order to generate impact for the agriculture industry. We then have the opportunity to implement that research, bring it to commercialization and create economic growth for the state.

Thank you for your investment and your trust in AURI. We are committed to doing good work, creating new products, processes and jobs in food, biobased products, renewable energy and coproduct utilization to help ensure a strong future for agriculture and the state of Minnesota. ■

ELSEWHERE IN AG INNOVATIONS

BY ASHLEY HARGUTH

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.



PHOTO BY ROLF HAGBERG

Mapping cattle genes

Ongoing genomics research in the beef industry may one day soon make it possible for producers to grow cattle that produce meat containing lean protein and good fats yet still provide the great taste today's consumers look for at the meat counter and potentially help all livestock species.

James Reecy, Iowa State University, has studied various research projects and says certain molecular markers in beef cattle have been able to predict the genetic merit of an animal. By identifying these markers, certain traits, such as growth, meat quality, diseases resistance and more could be controlled. If genetic superiority or inferiority can be predicted, you can make the selection for it without having to directly measure that trait, keeping costs to a minimum. For example, meat tenderness had to be measured after the animal was slaughtered, but looking at molecular markers, researchers are searching for ways to determine meat tenderness without having to kill the animal.

Soyatech Newsroom, April 2013

Increasing milk's nutrition

Research at Oregon State University found that dairy cows fed flaxseed produced more nutritious milk that had more omega-3 fatty acids and less saturated fat. Diets rich in saturated fat can increase cholesterol and those rich in omega-3 and other fatty acids can reduce the risk of -heart disease.

Traditionally, cows are fed a mix of corn, grains, silage and hay and produce milk with a lower concentration of omega-3. The cows in this study were fed up to seven percent of their daily diet of flaxseed without negatively affecting their production or the quality of milk.

ScienceDaily, January 2013



PHOTO BY ROLF HAGBERG

Heart healthy tomato

UCLA researchers have genetically engineered a tomato that produces a peptide, 6F, which mimics the actions of good cholesterol when consumed. This is especially important with all the focus on improving cardiovascular health.

Researchers fed the tomatoes to mice that lacked the ability to remove low-density lipoprotein (LDL or "bad" cholesterol) from their blood and readily developed inflammation and atherosclerosis when consuming a high-fat diet. The investigators found that mice that ate the peptide-enhanced tomatoes, which accounted for 2.2% of their Western-style, high-fat diet, had significantly lower levels of inflammation and less atherosclerotic plaque.

EmaxHealth, March 2013



Tapping into new kind of syrup

New Hampshire is finding its claim to fame in birch syrup. Unlike maple syrup from nearby Vermont, birch syrup taste completely different and can be sold for a higher price. With the industry growing in Canada and Alaska, although with a high cost of materials and transportation, Cornell University is studying this venture for the northeastern U.S. to see how much syrup can be made and at what price.

Maple syrup producers have the infrastructure so as soon as maple season is over, they can start with birch.

Associated Press, April 1, 2013

AURI'S CORE FOUR QUIZ

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

Food Products

One acre of wheat will produce how many loaves of bread?

- a. 550
- b. 1,600
- c. 2,000

Answer: c

Renewable Energy

Approximately how many jobs are created by the ethanol industry in Minnesota?

- a. 2,300
- b. 4,306
- c. 5,468

Answer: b

Coproducts

Agricultural fibers, such as corn stover and barley straw, can be used to clean water. This technique is known as:

- a. Straw purifier
- b. Biofilter
- c. Clean-catching

Answer: b

Biobased Products

PLA is a frequently-heard term when talking about biobased products. What is PLA?

- a. Polylactic Acid
- b. Plastic Look Alike
- c. Phospholipase A1

Answer: a

ABOUT AURI

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

Service Areas: What We Provide

Applied Research and Development

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.

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.

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

Labs are available to clients for hands-on testing and development.

Learn More

- Contact one of the AURI Offices to speak with a project development director about your business.
- Visit auri.org to see the latest research and learn about upcoming events.
- Sign up to receive the *Ag Innovations News* or the AURI electronic newsletter to stay informed about AURI projects and clients.
- Follow AURI on Facebook and Twitter to get notices about new research, upcoming events, where to find AURI at tradeshows and much more.

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PHOTO BY ROLF HAGBERG

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PHOTOS BY ROLF HAGBERG

Midwest Ag Enterprises and TechMix receive Ag Innovator of the Year Award

Partner companies create much-needed low-oligosaccharide feed

BY AMANDA WANKE

Midwest Ag Enterprises (Marshall, Minn.) and TechMix (Stewart, Minn.) were named Ag Innovators of the Year this June. This award is given annually to an exceptionally innovative company that has successfully created a product or process using Minnesota's agricultural commodities.

TechMix and Midwest Ag have partnered, with assistance from Minnesota Soybean and AURI, to address a long-standing problem in the livestock feed industry with an innovative solution. Historically, the high fiber and complex sugar content of soybean meal has kept it from being

suitable feed for young pigs and other single-stomach animals. These two Minnesota companies collaborated to create a unique process that produces a high-protein, low-oligosaccharide feed ingredient, called NutriVance, from conventional soybean meal in order to create a soybean meal that is palatable for young and single-stomach animals.

In addition to producing this meal, the companies have found a way to ensure that the indigestible sugars, which make up about 30 percent of the conventional soybean meal, are not wasted when they are removed. Midwest Ag and TechMix have found a way to utilize those sugars in dairy or beef cattle rations.

"NutriVance is a ground-breaking product that creates a feed solution that is good for livestock and soybean producers alike," says AURI Chairman Ron Obermoller. "They have been very aggressive about advancing the results of the research they worked on with AURI and moving that research to reality in the marketplace."

The two companies are in the start-up phase of producing NutriVance at a plant in Galva, Iowa, and hope to have full production running in August. The new product will create jobs at the production plant and at the companies' offices in Minnesota, and downstream will benefit many others including transportation and warehouse operators and soybean growers.

AURI helped with the development of NutriVance through:

- Scientific lab assistance during the creation of the process and product;
- Cost-share assistance, along with Minnesota Soybean, to fund research and development efforts; and
- Innovation networking to connect TechMix and Midwest Ag with Minnesota Soybean, the United States Soybean Export Council and others who could help in this new venture. ■