



# Ag Innovation News

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The newspaper of the Agricultural Utilization Research Institute

## Organic feed supplier nourishes local, regional economy

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PHOTOS BY ROLF HAGBERG

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# AURI and Minnesota pellet plant work together to retain jobs

Rivard's Seeds in Argyle, Minn., has been able to stay in business and retain jobs thanks in part to new work pelleting beet pulp for another Minnesota business. AURI Project Manager Becky Philipp helped connect the two businesses.

BY JONATHAN EISENTHAL



Glenn Rivard, Plant Manager, Rivard's Quality Seed

For 41 years Rivard's Quality Seeds had been one of a handful of businesses keeping the economy going in the small northwestern Minnesota city of Argyle, population 660. Finding ways to add value to agricultural products and coproducts from agricultural processing is the region's lifeblood. Rivard's specializes in pelleting, making loose materials dense enough to transport economically.

Over the years, Rivard's produced mostly a beef and bison feed made from parts of wheat, barley, soybean, corn, sunflower and pea screenings left over after harvesting, often called coproducts. With the improvements made to crop/herbicide safety through biotechnology, there are fewer coproducts remaining after harvest, and this resulted in the plant not having enough resources to turn into product, which threatened the vitality of the business and a loss of five jobs in the community.

In March 2011, AURI Project Manager Becky Philipp learned of Rivard's situation and reached out to them. She was confident there may be a way that AURI could help, and wanted to do whatever possible to keep this business in northwestern Minnesota alive. "Long-standing, staple businesses, such as Rivard's, are very important to the economic vitality of communities, particularly small, rural communities," says Philipp.

Glenn Rivard, co-owner of Rivard's Quality Seed, was very receptive to AURI's assistance. "The Rivards had given themselves a year to explore other possibilities to see if they could remain in business," says Philipp. "AURI does a lot of work in pelleting coproducts and has a vast resource network from which to draw, so I was optimistic that we could help."

So, Philipp started networking and found a business in Greenbush, Minn., that was interested in exploring possible pelleting opportunities. She connected them with Rivard's, and the link turned into a partnership; Rivard's now pellets beet pulp to be shipped across the US Farm Belt and overseas, to be sold for livestock feed.

"Because of the extra volume from beet pulp, I was also able to revive the grain byproduct business I'd had for more than 40 years," says Rivard. Thanks to the revival he was able to sell the business to D&D Commodities, Ltd., in nearby Stephen, Minn., so that the business

remains vital, and continues to operate with an eye to continued growth opportunities. Rivard remains the manager of the plant.

The beet pulp will keep Rivard's in steady operating mode for some time to come. With an eye to the future, Philipp also facilitated discussions with Rivard's and another processing business in northwestern Minnesota, which could expand the pelleting plant's product stream further. Going forward, AURI will continue to keep an eye out for other businesses that could partner with Rivard's as well. "Glenn was great to work with, and we are very pleased with the outcomes of this project," notes Philipp.

"We saved a handful of jobs," says Rivard, expressing gratitude for all those who worked together with him to solve the problem. "We weren't going to be able to keep on the way we were...we needed a certain volume of business to keep the doors open. A big thank you to AURI for helping us accomplish that." ■



## AURI and Rivard's Quality Seeds

### Idea to reality:

Rivard's Seeds no longer had enough post-harvest leftovers (coproducts) to support pelleting at their plant and needed to find a way to stay in business.

### AURI's role:

AURI helped connect Rivard's with another business that had product for them to pellet.

### Outcomes:

Rivard's retained five jobs, sold business to D&D Commodities, Ltd. and remains profitable with an eye to the continued growth opportunities.



# More whole grain foods on the menu

## AURI report reveals opportunities for adding value to Minnesota wheat and barley

BY LIZ MORRISON

Coming up on school menus: bread, pasta, tortillas, pizza, pancakes and other foods made with nutritious whole grains.

New federal standards for school meals, which are designed to combat rising rates of childhood obesity, will require more whole grains, like wheat and barley. The requirements offer opportunities for Minnesota farmers and food processors to meet the need.

That's the conclusion of a recent AURI report on value-added uses for Minnesota wheat and barley. The report reveals nearly two dozen potential uses for the grains, including nutraceuticals and food supplements, building materials, fuel and livestock feed.

Among the most promising value-added opportunities: high beta-glucan barley, aleurone flour, hard white wheat and whole-grain snack food products, says AURI Project Manager Becky Philipp, who led the study. Longer-term opportunities include specialty livestock feeds, straw building composites and biomass ammonia.

But whole grain foods offer the best prospects for adding value, says Dave Torgerson, executive director of the Minnesota Wheat Growers Association. Unlike corn and soybeans, wheat and barley are "not very competitive for industrial uses," he says.

Continued on page 4

PHOTO OF FIELD BY ROLF HAGBERG



## Wheat and barley use stagnant

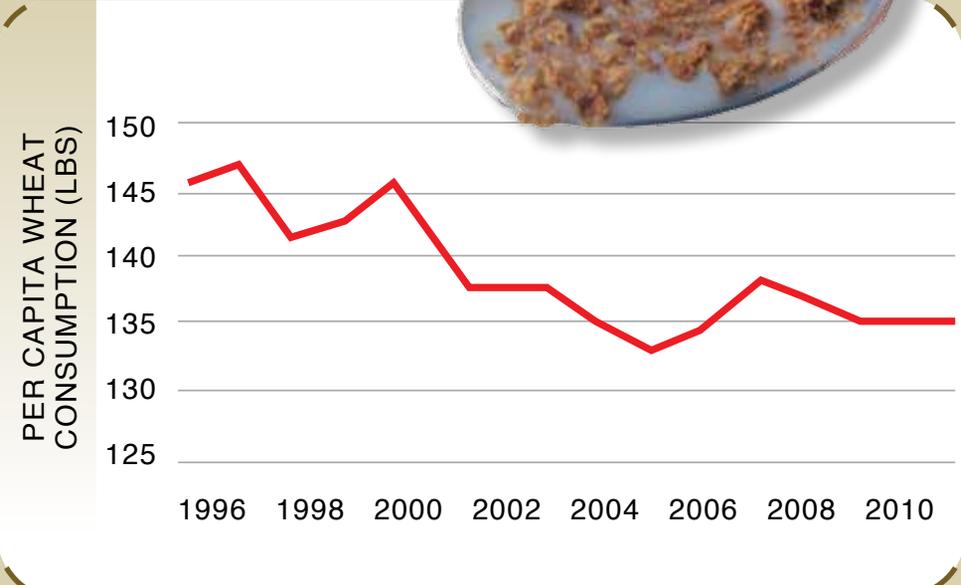
The AURI report comes at a time when market demand for wheat and barley is flat, and Minnesota small grains production continues to lose ground to more profitable crops — mainly corn.

In the last 15 years, barley has gone from a major state crop, with more than a million acres, to a niche crop of fewer than 100,000 acres — virtually all produced under contract with malting companies.

Likewise, Minnesota wheat acreage has dropped by almost half since the mid-1990s, when production peaked at about 2.4 million acres. In 2012, Minnesota growers planted 1.4 million acres of wheat, down 10 percent from 2011.

To remain competitive, Minnesota's wheat and barley sectors need to invest in more than variety and agronomic improvements, Philipp says. "They also need to identify alternative uses that will expand markets." The AURI study is aimed at "stimulating new ideas and new investment" in wheat and barley ventures.

## U.S Per Capita Wheat Consumption by Year



Just **1%** of Americans consume the recommended three whole grain servings per day.



## Promoting healthy food

The food industry "is highly focused on making food healthier," says Charan Wadhawan, AURI food scientist in Crookston. Whole grain food product introductions, for example, grew 20-fold from 2000 to 2010. Major food companies, such as Minnesota-based Cargill, are introducing nutritious "kid-friendly foods," such as whole wheat breakfast cookies and whole grain tortillas.

Yet, just one percent of Americans consume the recommended three whole grain servings per day. That gives Minnesota wheat and barley growers an opening to communicate the nutritional and health benefits of eating more whole grains, Philipp says.

The National Association of Wheat Growers is already focusing on this, Torgerson says. Per capita wheat consumption in the U.S. has been dropping since 1997, "but promoting the health benefits of these grains could help reverse that trend."

Likewise, "Minnesota growers could develop a strategy to position their wheat and barley products as premier whole grain products," says cereal scientist Neil Doty, N.C. Doty & Associates, Fargo, N.D., who wrote the value-added uses report in conjunction with the Praxis Strategy Group of Grand Forks, N.D.

To promote that effort, AURI is organizing industry forums for Minnesota millers, bakers, food manufacturers, and snack food companies to pitch some of the ideas in the report. "We're excited to begin this phase of the project," Philipp says.

"It is our hope that consumers will latch on to the whole grains dietary concept, and push food companies into purchasing specialty grains from the producers," says Marv Zutz, director of the Minnesota Barley Growers Association.

Torgerson agrees. Minnesota wheat and barley growers are looking to "food industry players to move this along. If food companies develop new products that increase wheat and barley consumption, that will benefit growers, too." ■

Read the full report at: [auri.org/2012/12/new-uses-wheat-barley/](http://auri.org/2012/12/new-uses-wheat-barley/)

## A closer look at some promising value-added opportunities for wheat and barley

### HIGH BETA-GLUCAN BARLEY: PACKED WITH HEALTHY FIBER

Beta-glucan, the soluble fiber portion of barley, has been shown to lower cholesterol. New barley varieties that are high in beta-glucan have already been developed for Minnesota, says Zutz. Meanwhile, multinational food company ConAgra recently introduced SustaGrain® high-fiber barley flour and cereal flakes, which contain three times more soluble fiber than whole oats.

Demand for high beta-glucan barley could exceed one million bushels a year, according to Doty, the report author. So far, though, “food companies have been reluctant to contract for high beta-glucan barley,” Zutz says, and growers have been unwilling to take a chance on growing those varieties without contracts, because they aren’t suitable for malting.

“Our hope is that smaller food companies can make inroads into the food market,” Zutz says, creating a demand for high beta-glucan barley.

### ALEURONE FLOUR: ABUNDANT AND SUPER-NUTRITIOUS

Aleurone, a component of wheat and barley kernels, is produced in large quantities as a byproduct of flour milling. Because it discolors refined flour, it’s sold as low-value animal feed. Yet, the aleurone layer is very rich in nutrients, especially vitamin B6, niacin and vitamin E, plus fiber and antioxidants.

Responding to growing demand for whole grain flour products, Horizon Milling, a division of Minnesota-based Cargill, has developed a proprietary process for milling aleurone flour. The company’s GrainWise® Wheat Aleurone offers food-makers a way to add dietary fiber and other nutrients to flour-based products without changing color, taste or texture, the AURI report says.

“As the public becomes more aware of the benefits of whole wheat and barley and their antioxidant contributions,” Doty says, “mill products like aleurone flour will be in demand to supply a concentrated source of nutrients.”



### HARD WHITE WHEAT: KIDS LIKE IT!

The secret to getting kids to eat — and enjoy — whole grain foods could be hard white wheat.

Children often object to the color, texture and taste of traditional whole wheat products made from hard red wheat. But studies have found that school children couldn’t tell the difference between foods made with refined white flour and whole hard white wheat flour.

“Wheat breeders, millers, and food manufacturers involved in school feeding have embraced the use of whole white wheat to stealthily introduce whole grains into the school food service industry,” Doty says.

Hard white wheat is a niche crop grown in arid western North Dakota and Montana. Unfortunately, there are no varieties available now for Minnesota’s wetter climate, Torgerson says. So he sees little opportunity for Minnesota farmers to grow the specialty crop “unless there’s a breakthrough in variety development to prevent pre-harvest sprouting.” ■

## New school lunch menus feature more whole grains

Under new federal standards for school meals, half of refined grains in foods such as bread, pasta, pizza and cereal must be replaced with whole grain products. The new requirements are aimed at improving the nutritional quality of school meals and combating rising rates of childhood obesity.

### BEFORE AND AFTER ELEMENTARY SCHOOL LUNCH MENUS

MO	TU	WE	TH	FR
<b>BEFORE</b> Bacon and Cheese Burrito <i>with mozzarella cheese</i> Applesauce Orange Juice 2% Milk	<b>BEFORE</b> Hot Dog on Bun <i>with ketchup</i> Canned Pears Raw Celery and Carrots <i>with ranch dressing</i> Low-fat Chocolate Milk	<b>BEFORE</b> Pizza sticks <i>with marinara sauce</i> Banana Raisins Whole Milk	<b>BEFORE</b> Breaded Beef Patty <i>with ketchup</i> Wheat roll Frozen Fruit Juice Bar 2% Milk	<b>BEFORE</b> Cheese pizza Canned Pineapple Tator Tots <i>with ketchup</i> Low-fat Chocolate Milk
<b>AFTER</b> Submarine Sandwich <i>on a whole wheat roll</i> Refried Beans Jicama Green Pepper Strips Cantaloupe Wedges Skim Milk Mustard Reduced-fat Mayonnaise Low-fat Ranch Dip	<b>AFTER</b> Whole Wheat Spaghetti <i>with Meat Sauce</i> Whole Wheat Roll Green Beans Broccoli Cauliflower Kiwi Halves Low-fat Milk Low-fat Ranch Dip Soft Margarine	<b>AFTER</b> Chef Salad <i>with romaine, low-fat mozzarella, grilled chicken</i> Whole Wheat Soft Pretzel Corn Baby Carrots Banana Skim Chocolate Milk Low-fat Ranch Dressing Low-fat Italian Dressing	<b>AFTER</b> Oven-Baked Fish Nuggets Whole Wheat Roll Mashed Potatoes Steamed Broccoli Canned Peaches Skim Milk Tartar Sauce Soft Margarine	<b>AFTER</b> Whole Wheat Cheese Pizza Baked Sweet Potato Fries Grape Tomatoes Low-fat Milk Low-fat Ranch Dip

Information from the Healthy, Hunger-free Kids Act of 2010.



### AURI and Partners

#### Idea to reality:

The Minnesota Association of Wheat Growers and the Minnesota Barley Growers Association wanted to identify new or alternative uses for wheat and barley.

#### AURI’s role:

AURI revisited the 2002 National Association of Wheat Growers New and Improved Wheat Uses Audit, expanded that work, and identified the best potential new and value-added uses for Minnesota wheat and barley.

#### Outcomes:

AURI staff are sharing the report findings at food industry forums for small- and medium-sized millers, bakers, food manufacturers, and snack-making companies with the goal of increasing knowledge about these possible new uses, which will lead to new products and processes that add value to these commodities.

#### Partners:

Minnesota Association of Wheat Growers; Minnesota Barley Growers Association; Neil Doty of N.C. Doty & Associates; Praxis Strategy Group.



# Organic meal helps country elevator thrive

Minnesota sees growing demand  
for organic feed



Glen Nelson and AURI Project Manager Randy Hilliard have expanded their organic feed business. Here, they are pictured with the soybean meal (center-upper).

BY LIZ MORRISON

Times are tough for small country elevators. Big grain price swings, higher capital requirements and consolidation have eroded profits, forcing many rural elevators to close.

But a struggling coop elevator in northwest Minnesota met these challenges by responding to a need for organic feed.

With help from AURI, Clearbrook Elevator is crushing organic soybeans for certified organic dairy feed. What began as a sideline business has grown to nearly half of the elevator's \$2 million annual feed revenues. Now, the 200-member coop has set its sights on further expansion of the organic feed business.

"Over the years, it's been very difficult to stay in business," says Glen Nelson, manager of the Clearbrook Elevator, which was founded in 1939. The organic soybean crushing operation "has helped us maintain a profitable bottom line. In the last three years, or so, we're doing much better."



He worked together for several years to help develop the beans (right), extruded pellets (center-lower) and the

## Developing suppliers and customers

At first, it was a struggle to source enough certified organic soybeans to supply the need for organic meal. “There weren’t that many growers” offering feed-grade organic soybeans, Nelson says. Minnesota farmers typically plant 25,000 to 30,000 acres of organic soybeans, many of them food-grade beans destined for Asia. But word got around about the little elevator in Clearbrook, and now, “I have organic growers calling me.”

The elevator pays hefty premiums for organic — typically at least double the price of conventionally-grown soybeans. In early January, for example, feed-grade organic beans were trading for about \$28/bushel. Organic soybean meal also commands about twice the price of conventional meal, running around \$1,100 per ton.

Beginning with the Kleppes, who achieved organic certification in 2007, the coop’s organic soybean meal customers have grown to about 15. The soybean oil is also sold as organic livestock feed.

One of just two commercial certified organic soybean crushing facilities in Minnesota, Clearbrook Elevator now crushes about 300 tons of organic soybeans a year.

The company is continuing to expand its organic soybean meal business, aided by a \$300,000 USDA Value-Added Producer Grant awarded last February. In order to help Clearbrook apply for the grant, Hilliard connected the elevator with Cooperative Development Services, which put together a formal business and marketing plan necessary for the application, and AURI offered cost-share assistance for the services.

The grant enabled the coop to hire a salesman to call on organic livestock producers, marketing to organic poultry and hog producers in addition to milk producers. The elevator, which employs eight, also added a new staff position to handle the growing organic operation.

## Supporting the organic sector

Having a local supply of organic soybean meal has been a boon to northwest Minnesota’s organic livestock sector, says Carol Kleppe. She’s convinced that “if it weren’t for going organic, we wouldn’t be dairying today.”

Organic milk premiums have helped them, and other small milk producers, stay in business, she says. The Kleppes and five other organic dairy farms in Polk and Clearwater counties all sell their milk to Organic Valley, of LaForge, Wis. Together they produce enough milk to make it practical for Organic Valley to send a milk truck.

Clearbrook Elevator is a good example of successful rural economic development, Hilliard says. The soybean venture has helped maintain a longtime business in the town of 500 and has even created a couple of new jobs. It also shows “how AURI can assist with an idea from the beginning, starting with feasibility, all the way through implementation. And AURI continues to be there for them as they expand.” ■



Carol Kleppe, a longtime milk producer, began the transition to organic feed in 2005.



**AURI and Clearbrook Elevator**

### Idea to reality:

Minnesota’s Clearbrook Elevator received interest from customers who wanted to buy organic feed for their livestock.

### AURI’s role:

AURI conducted a preliminary feasibility analysis, offered innovation networking with Cooperative Development Services and helped Clearbrook receive a \$300,000 USDA Value-Added Producer Grant.

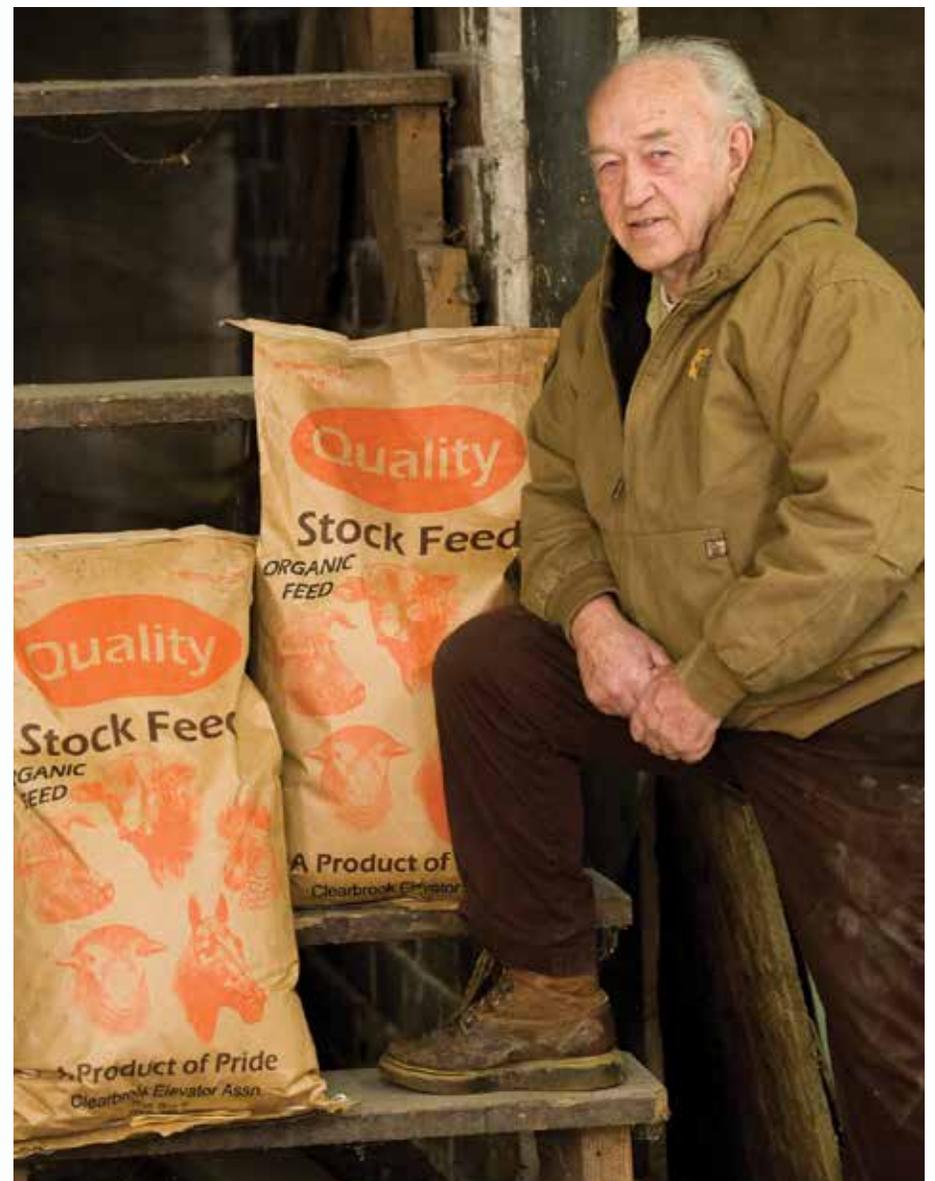
### Outcomes:

One of just two commercial certified organic soybean crushing facilities in Minnesota, Clearbrook Elevator now crushes about 300 tons of organic soybeans a year, and organic feed represents nearly half of the elevator’s \$2 million in annual feed revenue.

### Partners:

USDA, Cooperative Development Services

Glen Nelson with bags of the organic feed that is helping Clearbrook Elevator stay profitable.



## A need arises

The venture began with a request from a nearby dairy farm. In 2005, Carol and Arne Kleppe, longtime milk producers from Clearbrook, decided to begin the transition to organic. That meant their 130-cow herd could be fed only certified organic feedstuffs.

At the time, Carol Kleppe (cover photo) was serving her third term on the Clearbrook Elevator Board of Directors. “The elevator was struggling,” she says. “Their largest account had stopped milking the year before, and I was afraid if we quit buying feed, too, it would be another significant financial blow to the elevator.” At a board meeting, she asked if the coop would be interested in supplying organic feed.

Nelson decided to look into it, and asked AURI for help in evaluating the idea.

“We helped them do a preliminary feasibility analysis on small-scale soybean crushing to see if this made sense for them,” says AURI Project Manager Randy Hilliard, who has worked with the coop for several years.

Later, Kleppe recalls, Nelson told the board: I think this is something we could — and should — do.

# AURI awarded \$68,000 USDA Grant

Funds will help with further development of Minnesota cooperatives



AURI has been awarded a USDA Rural Cooperative Development Grant (RCDG) for \$68,340 to further assist with the development of rural cooperatives in Minnesota in 2013. The work done with the grant will build on AURI's previous successful work implementing an RCDG grant in 2011-12.

With the funds, AURI will provide applied research, scientific assistance, project facilitation, marketing, economic feasibility and organizational development services to new or existing cooperatives in the areas of local foods marketing and distribution, dairy processing, livestock feed processing, food processing and renewable energy

"Throughout our 23-year history, AURI has provided assistance promoting the development of cooperatively and mutually-owned businesses, and we are pleased to partner with USDA to continue that work," explains AURI Executive Director Teresa Spaeth. "From the early stages of innovation and formation through well-established coops, the needs of each vary considerably, and AURI can come alongside them to offer organizational development services and scientific services."

With the funds, AURI aims to:

- Use cooperative development as a strategy to maintain or improve economic conditions of eligible rural areas
- Provide direct technical assistance and applied research services to meet the cooperative development needs of at least five cooperatives representing 6,850 producers in various stages of development in economically distressed areas
- Continue to grow a collaborative, integrated approach of delivering cooperative development services, utilizing the most appropriate expertise available.

"AURI has a proven record of success in helping cooperatives strengthen rural economies and boost local agricultural producers," says Colleen Landkamer, USDA Rural Development State Director. "When we're out in rural areas, we hear often about the need for more resources in the area of technical assistance and planning. This grant will provide some of those resources for cooperatives in Greater Minnesota." ■

Chippewa Valley Ethanol Company is one of the cooperatives helped through USDA's Rural Cooperative Development Grant.

## AURI opens St. Paul offices

AURI has opened new offices in St. Paul, leasing space on the University of Minnesota's St. Paul campus. This is the fourth official location for AURI, which also has offices in Crookston, Marshall and Waseca.

"With a large number of clients as well as several strategic partners located in the Twin Cities, it is important for us to have an urban presence," says AURI Executive Director Teresa Spaeth. "We're also excited to be on the University of Minnesota campus as our relationship with the university is critical in our research and development efforts."

Currently, AURI Senior Director of Science & Technology Rod Larkins and Project Manager for Collaborative Initiatives Jennifer Berquam will be located in the new offices, which are located at the University of Minnesota Biological Sciences Center, 1445 Gortner Avenue, St. Paul, MN 55108. ■

### NEW AURI STAFF



Jennifer Berquam, Project Manager for Collaborative Initiatives

## Berquam and Skogen join AURI staff

AURI is pleased to announce that Dan Skogen and Jennifer Berquam joined the AURI staff this past January. Skogen is planning and government relations director with responsibilities that include identifying and evaluating opportunities to advance value-added agriculture and serving as the liaison between AURI and state and federal agencies. Berquam is project manager for collaborative initiatives with responsibilities including building state and regional relationships and initiatives on behalf of AURI. Both Skogen and Berquam bring extensive experience in agriculture and public affairs.

Skogen comes to AURI with deep roots in agriculture, having grown up on a dairy farm in central Minnesota. He has spent more than 30 years in radio broadcasting, served in the Minnesota Senate from 2007-2010,

and was on the board of directors for a rural electric cooperative, all while continuing to hobby farm with small grains, hogs and beef. During his time in the Senate, Skogen was vice chair of the Environment and Natural Resources Committee and also served on the Agriculture and Veterans Affairs, K-12 Education, and Commerce and Consumer Protection Committees.

Berquam served most recently as the committee administrator for the Agricultural and Rural Economies Committee and Finance Committee of the Minnesota Senate. Prior to that, she worked with the Minnesota Board of Peace Officer Standards and Training as a legislative and rules coordinator and with Messerli & Kramer as a legislative assistant. ■



Dan Skogen, Planning and Government Relations Director



# Gluten-Free Baking

BY CHARAN WADHAWAN,  
PH.D. SENIOR SCIENTIST,  
FOOD AND NUTRITION

Since 2009, the retail gluten-free food market has grown 200 percent, according to U.S. Foods, a leading food distributor. What is responsible for the continued growth is debatable. Some health experts believe that it may be due to more awareness of celiac disease and gluten sensitivity or gluten intolerance. Other factors may include the improved taste of gluten-free products, consumer perception that it's better for you than traditional food, trendiness, and interest in natural and organic food.

In my opinion, a gluten-free diet is not a healthier diet for those who don't need it. Most gluten-free breads are lower in protein content, contain little fiber and lack micro-nutrients that are present in whole-wheat flour.

## Who needs a gluten-free diet?

A gluten-free diet excludes all foods containing gluten, which is found in wheat, barley, rye and triticale. This diet is recommended for people with celiac disease, which is a genetic autoimmune disease where the surface of the small intestine that absorbs nutrients from food is damaged by the consumption of gluten. According to the National Foundation for Celiac Awareness, an estimated 1 in 141 Americans is affected by celiac disease. These individuals require a strict, lifelong gluten-free diet.

There is also a segment of population that is believed to have a non-celiac condition called gluten sensitivity or gluten intolerance. There are a lot of unknowns about this condition, including how to identify people with the condition, but we do know that gluten-sensitive patients can have abdominal pain similar to irritable bowel syndrome, vomiting, fatigue, headaches and paresthesia (tingling of the extremities). There is little scientific data to back up most of these claims.

## Gluten-free baking and products

Replacement of wheat in baked products poses technical challenges as gluten affects the texture and taste of the products and is difficult to duplicate. Without it, bread products turn out with a flat, heavy and dense texture. In cakes and cookies, the problem is not as critical. Food manufacturers have developed a range of ingredients that mimic the functionality of wheat flour, and there are a lot of different products that can be used when creating gluten-free baked goods including corn, rice, wild rice, buckwheat, amaranth, sorghum, millets, nuts, sunflower seeds, flax seeds, tapioca and beans such as soy and legumes.

Cost is always a factor in the formulation of gluten-free products because wheat flour is a comparatively inexpensive ingredient when compared with most of the ingredients used to replace it.

Gluten can also be present in food due to cross-contamination as a result of manufacturing or distribution practices. A good example is oats, which are gluten free but avoided by those with Celiac disease because they are often

AURI client Mark Edevold, with Winsor Products Company, Inc., works with AURI's Charan Wadhawan on gluten-free lefse.



contaminated with gluten-containing grains. Many pre-packaged foods also contain gluten containing grains. Read the label to make sure all the ingredients in the product are gluten free.

## Keeping important nutrients

Gluten-free products are typically made from refined flours and starches. These are lower in protein and fiber, while other ingredients like sugars and fats remain the same. To maintain the nutritional value of gluten-free products, addition of soy meal, dry edible bean powders, whey powder or egg whites can improve the nutritional profile of the finished product.

## AURI's work on gluten-free products

At AURI, we provide scientific assistance with the development of commercial gluten-free products. Over the years, we've provided assistance to entrepreneurs in this area, including Bittersweet Bakery and Pappa Q's Gluten-Free Mixes. As the gluten-free trend continues, we see a growing interest from food manufacturers to capitalize on this trend, and we're excited to continue to help Minnesota's small- and medium-sized businesses expand with new products and processes that meet market demand. ■



BY TERESA SPAETH  
AURI EXECUTIVE DIRECTOR

## Partnering for Progress

*"It is literally true that you can succeed best and quickest by helping others to succeed."*

I recently came across this quote by Napoleon Hill, who is considered to be a great author on the topic of success, and it struck me because it sums up what AURI is all about. Our passion is helping Minnesota businesses, entrepreneurs and farmers succeed; and in order to do this effectively, we work with organizations across the state and country that bring to the table skills and expertise that complement those of AURI.

Our partnerships and collaborations range from organizations that offer grants and funding to those that provide services and networking; all of which are essential to the success of our clients.

In this issue, you'll read several examples of partnerships that have been essential to success. Here are a few highlights:

- **USDA:** AURI recently was awarded a \$68,000 grant from the USDA to help with the continued development of rural cooperatives; work AURI has been doing for several years. In addition, Clearbrook Elevator received a USDA Value-Added Producer Grant that was essential to their success.
- **U of M:** In this newspaper, you'll most often read about the research we do in collaboration with the University, but in this issue you'll see another way we partner—by sharing space. AURI now has offices on the University's St. Paul campus, as well as at University locations in Crookston and Waseca.

- **Private research organizations:** In the article on possible new uses of wheat and barley, you'll see how AURI partnered with Neil Doty of N.C. Doty & Associates and the Praxis Strategy Group to conduct the necessary research.
- **Economic development organizations:** In several articles are examples of collaboration between economic development organizations and AURI in order to build success for all of the involved partners. Collaborators highlighted in this issue include the Fergus Falls Economic Development Improvement Commission and Cooperative Development Services.

By helping other organizations succeed in their work, and thereby helping our clients succeed, we are building a stronger Minnesota. ■

## ELSEWHERE IN AG INNOVATIONS

BY ASHLEY HARGUTH  
CARTOONS BY UNCLE HYGGLY

*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.*



### Weeding robots

Stanford trained engineers have developed a "Lettuce Bot," a machine for thinning lettuce. The machine is pulled behind a tractor and uses computer vision and robotics to pull weeds from rows of lettuce. Pictures are taken of the passing plants, and the machine compares them to a database of more than a million images of plants from various angles. If plants are identified as being too close together, they receive concentrated fertilizer, which kills the unwanted seedling and at the same time provides nutrients to the remaining plants.

This machine could be transformed into an alternative for weed control in row crops in the Midwest, when a weed is detected a system with something like rotary blades would take out the weed.

Corn and Soybean Digest, Jan 2013

### Beet pulp plastic

Sugar beet pulp, leftover residue from sugar extraction has long been studied by the Agricultural Research Service. Researchers there, along with Washington State University, have developed a biodegradable thermoplastic from this pulp.

The packaging is made from sugar beet pulp and polylactic acid (PLA). PLA is derived from sugars in plants like corn, sugar beet, switchgrass, sugarcane and other plants. The research showed that up to 50 percent of the sugar beet pulp can be incorporated with PLA into the plastic. This packaging is comparable to white, spongy food packages.

Sugar beet pulp could also be processed with water and/or glycerol to create a material like opaque plastic containers, bags and film coverings.

USDA-ARS, Jan 2013

### Making more ethanol

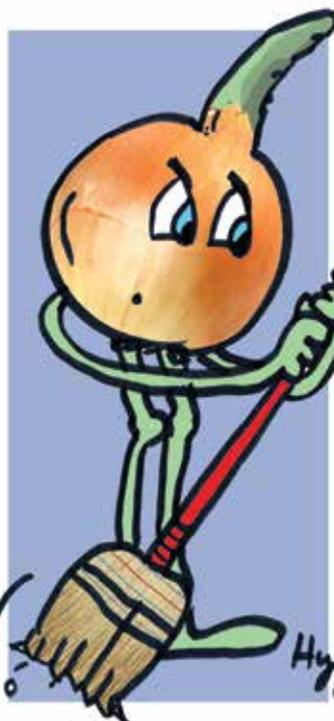
A California company has created a "vitamin" shot for the ethanol industry. Novozymes announced a new product that will help ethanol producers get an extra 2.5 percent of ethanol out of the same amount of corn. This product is used after the corn meal is made into a mash, and enzymes convert the starch in the mash to sugar, which is then fermented to ethanol. With the new product, a plant that typically uses 900,000 tons of corn could save 22,500 tons of corn while still producing the same amount of ethanol.

Biofuelsdigest.com, Oct 2012

### Lower blood pressure from beet juice

Drinking a glass of beet juice may lower blood pressure, according to a study published in Nutrition Journal. While other studies had been done on beet juice, and it was found to lower blood pressure, this was the first study to look at its effects without making other diet or lifestyle changes. The researchers speculate it is the nitrates in the juice; nitrates are converted to nitric oxide in the body, which relaxes blood vessels and dilates them, helping the blood flow and lowering blood pressure.

Nutrition Journal, Dec 2012



### Leftovers cleaning up

Onion and garlic leftovers from the food industry may no longer be just waste. Research, done by GGS Indraprastha University in India, stated in the International Journal of Environment and Pollution that these leftovers could be used to absorb hazardous heavy metals such as arsenic, cadmium, iron, lead, mercury and tin.

The research looked at the influence of contact time, temperature, acidity or alkalinity and concentration of the various metals for industrial-scale decontamination. The most effective use was the removal of lead.

The absorbed metals can be released into a collecting container using nitric acid, and the biomass can be reused. These findings create an opportunity for food manufacturers to create value from the waste they generate.

Foodproductiondaily.com, Dec 2012

## 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

**Meat processors are required to have a HACCP plan in place. What is HACCP?**

- a) How to Accurately Cut & Cook Proteins
- b) Hazard Analysis & Critical Control Points
- c) Heating & Cooling Conditions for Pork
- d) Having Awareness of Cleaning & Contamination for Prevention

Answer: b

### Renewable Energy

**What is Minnesota's approximate biodiesel production?**

- a) 20 million gallons
- b) 60 million gallons
- c) 40 million gallons
- d) 850,000 gallons

Answer: b

### Coproducts

**Dried distillers grains with solubles (DDGS) are a leftover of what type of production?**

- a) Ethanol
- b) Biodiesel
- c) Methane
- d) Cooking oil

Answer: a

### Biobased Products

**Klean Soap was accidentally made from what?**

- a) Recycled plastic
- b) Fruit peelings
- c) Sugar
- d) Vegetable oil

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 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](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.
- 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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AURI's Michael Sparby and Vector's Jeff Ackerson examine a new window.

# Insulating with Soy

PHOTOS BY ROLF HAGBERG

## Minnesota company aims to benefit environment and farmers through new product

BY AMANDA WANKE

Soybeans aren't just for food and fuel anymore... in fact, the window you're looking out just may be lined with a soy-based insulation. That's the hope of Vector Windows, a Fergus Falls, Minn., window company that has aimed to create advanced, cost-effective windows since 1995.

As Vector co-owners Jeff Ackerson and Andrew Miller have continuously looked for ways to

improve the performance of their windows, they recently began focusing on the insulation. "We looked at multiple options, from petroleum-based insulation to pink insulation to the soy-based product," explains Ackerson. "When we started comparing the pros and cons, each of the insulations gave us what we needed; we wanted to go the extra distance and use a product that was biorenewable, good for the environment, and helps some of our customer base—farmers."

During their exploration of insulation options, Fergus Falls' Economic Development Director Harold Stanislawski introduced Ackerson and Miller to AURI. AURI staff helped introduce them to the concept of the soy-based insulation and then connected them to the manufacturer and equipment provider. AURI also provided cost-share assistance for testing to ensure LEED (Leadership in Energy and Environmental Design) compliance for windows using PLA (polylactic acid) in their structure.

Approximately one year ago, Vector began using the new soy-based insulation, which they call BioCore Foam Filling, along with triple-pane glass, to offer customers windows that reach an R-5 insulation rating—the high end of window performance. Now, Vector plans to offer the BioCore Filling as a stand-alone add-on to windows, so that customers can choose the improved insulation without the additional cost of triple-pane glass.

Reactions to the product thus far have been positive. "We get compliments," says Ackerson. "Not only do the insulated, triple-pane windows have a better insulating factor, they also help with condensation resistance."

Today, Vector is thriving, with 74 employees and more growth on the horizon. Between the BioCore Filling, the company's great customer service, and the possibility of additional bio-renewable parts, the future is looking only brighter for this Minnesota company. ■



Soy-based insulation fills the frame of this Vector window, helping to improve the energy efficiency of the window.