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BIO PLASTICS

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PHOTO BY DAN LEMKE

SWEET as HONEE

A jelly mistake turns into a natural sweetener

BY ASHLEY HARGUTH

Plymouth, Minn. — Katie Sanchez was trying to make apple jelly. She made a mistake — which turned into a thick sugar that tastes like honey.

After two years of product development, Sanchez just turned out 3,000 bottles of the accidental Bee-Free Honee for Whole Foods Market in the Twin Cities. And she's negotiating with other specialty food markets to sell her all-natural sweetener.

Not quite jelly

Years ago, Sanchez decided to attempt apple jelly after a day of picking apples. She soon realized that she forgot to add pectin, a thickening agent, but jarred it anyway. When she tasted the jelly, it was like honey.

Sanchez was a pastry chef, but left the baking industry after her son was born with special needs. She couldn't work the long hours and took an office job, but continued baking on her own.

She wondered if there might be an interest in her apple "honey." An orchard manager told her about AURI, and Sanchez began working with Charan Wadhawan, AURI's food scientist in Crookston. "Charan took me through the steps and made the whole process a lot less scary," Sanchez says.

Bee-Free Honee is slightly tart, made by hand from a variety of apples, with a little lemon juice and sugar added. Just as honey's taste varies, depending on the flowers bees visit, Bee-Free honee varies by the apple mixture used.

Like honey, Bee-Free doesn't have to be refrigerated and has a one-year shelf life. It's a good substitute for toddlers who, specialists recommend, should not be fed honey until age two. Sanchez says she could have used this product as a pasty chef, as it's not as strong as maple syrup and allows subtle flavors to come through.

Help is SWEET

"It is an all-natural product that will help fill the honey shortage," from decreasing bee populations, Wadhawan says. A survey by the Apiary Inspectors of America and the Agricultural Research Service showed a 33 percent loss in managed honeybee colonies nationwide, from October 2009 to April 2010. The beekeepers surveyed said starvation, poor weather and weak colonies going into winter were primary reasons for the mortalities.

Wadhawan helped Sanchez standardize and scale up her product's formula and production process. The AURI scientist assisted with nutritional analysis, labeling, trouble-shooting and a shelf-life study.

Wadhawan also connected Sanchez to Minnestalgia Foods in McGregor, Minn., which manufactures and packages jelly, syrup and barbeque sauces. The business includes Minnestalgia Winery, which makes wines from native fruit, wild berries and honey. Sanchez wanted to use local products to produce and package Bee-Free Honee. Minnestalgia was "unbelievable in helping me work through problems," Sanchez says.

"This product is a great alternative to conventional honey," Sanchez says. It can be used in equal proportions and "tastes much like honey." ■

TURKEY
BEYOND THANKSGIVING

Southern Minnesota producer makes turkey sausages that sizzle throughout the year

PHOTOS BY DAN LEMKE

Carissa Nath, AURI meat scientist, samples gourmet turkey sausages that she is helping southern Minnesota producers develop to expand the turkey market to grill season.

BY DAN LEMKE

Cannon Falls, Minn. — For millions of Americans, the traditional Thanksgiving dinner is all about the aroma of a bronze-baked turkey pulled from the oven — a feast for the eyes as well as the palate. But for turkey producers, it's a challenge convincing consumers they should enjoy the big bird year-round.

Minnesota producer John Peterson is committed to expanding our turkey habits. Ferndale Market, his family's on-farm retail store, offers gourmet turkey sausages flavored with red pepper and garlic, spinach and feta cheese and Italian seasoning.

Peterson's farm, off Highway 52 near Cannon Falls, has been in the family for more than 70 years. In 2008, the Petersons opened Ferndale Market, named after grandparents Dale and Fern Peterson. Beside the family business's turkey products, the retail store offers locally-produced meats, cheeses, dairy products, seasonal produce and specialty foods.

TURKEY BRANDING

"I had an interest in developing a brand and wanted to build on the foundation my family had laid," Peterson says.

Peterson studied business and communications in college. In 2008, he returned with his wife Erica to the farm business his grandparents started and that his parents Dick and Jane operated. That year, the family renovated part of their turkey hatchery into an 1,800 square-foot retail space.

The farm raises almost 200,000 free-range turkeys annually. Birds are turned out to pasture during the spring, summer and fall. Besides on-farm retail, Peterson's turkey products are marketed through wholesale channels to natural food stores, select grocery stores and restaurants.

"I looked into the food system, and how food is delivered, and recognized that we were doing things differently than most," Peterson says. "That difference could appeal to certain demographics."

GOURMET TURKEY YEAR-ROUND

Peterson is working with AURI meat scientist Carissa Nath to formulate a line of fresh and natural turkey sausages. "These are pretty unique products," Nath says. "There aren't a lot of fresh turkey sausages out there with these gourmet flavor profiles."

"Turkey consumption is still very seasonal," Peterson says. "This will give us the opportunity to increase our mix of products and provide a little more balance in demand."

Turkey times are a changing, says Steve Olson, Minnesota Turkey Growers executive director. While the turkey was once just the bird of Thanksgiving, today "about 70 percent of turkey consumption" isn't during the holidays, Olson says.

Turkey industry leaders "have helped increase consumption through the development of new products," Olson says. Minnesota leads the nation in turkey production and, this year, will raise 45 million birds.

Peterson hopes the new products will help consumers, accustomed to pulling a Thanksgiving turkey from the oven, to enjoy pulling sizzling turkey sausages off the grill in July. ■

John Peterson and his family raise almost 200,000 turkeys annually on their southeast Minnesota farm, where they have opened a retail store and are expanding into value-added markets.

SUN-INSPIRED

Central Minnesota cattle farmer diversifies to on-farm sunflower oil processing

By Cindy Green

The rains stopped and a sunflower oil business sprouted in central Minnesota.

"A couple years ago, when there was a drought, I was looking for a crop that could grow on poor soils, and I checked into sunflowers," says Tom Smude, a cattle and feed-crop farmer. With his wife Jenni, Smude is now cold-pressing sunflower seeds for oil in their on-farm facility near Pierz, Minn.

Smude Enterprises LLC raises high-oleic sunflowers, with seeds higher in unsaturated and polyunsaturated fats and vitamin E than typical sunflowers. The oil is sold in central Minnesota groceries, natural food markets and gift shops under the Smude Virgin Cold Pressed Sunflower Oil label. Markets are expanding weekly.

Watching the market

Entrepreneurship comes naturally to Tom Smude (pronounced smoo-dee). Both his parents grew up on dairy farms and, while his father became a John Deere dealer, he continued to raise cattle. After college, Smude bought his first three beef cows. "Eventually, I raised that herd to 100," says Smude who started his own farm operation with his wife 10 years ago.

When Smude decided to raise sunflowers, "fuel prices were soaring and I looked into crushing sunflowers for biofuels," Smude says. But after prices declined, a friend "told me to check out food-grade sunflower oil." After researching the oil, he ordered a few bottles online. "We loved cooking with it," Smude says. And it fits their "eat local; buy local" philosophy. "I want to go from the field to the shelf and be sustainable."

On-farm crushing

The Smudes built an oil-crushing facility that was inspected by the Minnesota Department of Agriculture to make sure the process and equipment met code. Except for the presses and filter from Germany, Smude purchased most of the equipment locally and hired local contractors.

AURI scientists tested the oil for fatty-acid composition at the Marshall oils lab and Charan Wadhawan, AURI food scientist in Crookston, completed a nutritional analysis for labeling.

In late February, Smude Enterprises started processing sunflower oil and expects to produce about 40,000 gallons this year. Beside the Smudes, 10 local farmers are growing about 1,000 acres of sunflowers for the seed-oil business. Smude also planted flax, which will be harvested and pressed for oil this fall.

After sunflowers are cleaned, de-hulled and separated, the nut meat is run though a screw press that extracts 90 percent of the oil. The cold-press method doesn't require heat or chemicals so "all the natural minerals remain in the oil," Smude says.

The oil is filtered and stored in tanks, which hold 21,000 gallons, before the oil is bottled in 16-ounce, half-gallon, one-gallon and 2.5 gallon containers. Smude oil doesn't contain preservatives but can be stored for up to 12 months before there's a risk of turning rancid. After every 300-gallon production run, Smude sends a sample to the Minnesota Valley Testing Laboratories in New Ulm to test for E. coli, yeast and mold. He's never had a problem.

From field to bottled oil, none of Smude's byproducts are wasted. After oil is extracted, the presses extrude high-protein pellets that are added to cattle feed. The hulls are used in chicken and cattle bedding. Stalks are plowed into the soil.

Marketing assets

Consumers value high-oleic sunflower oil because it's similar in nutritional value and composition to olive oil. Its saturated fat content — 1.5 grams per one-tablespoon serving — is lower than olive oil's 2 grams.

"Popcorn is the number one use; it tastes like butter," Smude says. Some taverns with commercial poppers have tried it with raves from customers. The toasty flavor is especially good for pan-frying fish and potatoes, stir fries and salads, write fans on Smude's blog. Smude Enterprises may soon introduce flavored oils such as garlic and jalapeno, which Wadhawan will help develop and conduct taste tastes.

"The product should sell itself," as other cold-pressed, high-oleic sunflower oils are selling for 30 to 40 percent more online, Smude says. A 16-ounce bottle of his sunflower oil retails for about $11, close to a modestly-priced extra virgin olive oil, and it's Minnesota grown.

"I have not seen many projects with sunflowers for quite some time," says Randy Hilliard, AURI project director, who has helped Smude investigate other high-value markets such as massage oils and lotions.

"I give him a lot of credit for taking on a venture like this," Hilliard says. "It's creating economic development and job creation in a rural area, and its adding value to a commodity, which matches AURI's mission."

Sun up to past sundown

Smude is selling about 20 cases of oil per week online and at nearly 20 area retailers and restaurants. Besides managing Smude Enterprises, he works full time at his father and uncle's John Deere dealerships. He currently has three part-time employees and when production increases, he expects to add more.

On the side, Smude is custom crushing specialty oils, such as flax, for other food companies. He is test crushing camelina seed for a Staples Community College research team that is investigating sustainable crops for biodiesel production. The additional business could keep Smude's operation afloat while his markets for high-oleic sunflower oil expand.

How does he juggle all this? Easy, Smude says: "I start at 6 a.m. and go to midnight." ■

For more information on Smude sunflower oil or to purchase online, visit smudeoil.com.

Tom Smude built a processing facility on his farm with screw presses (at right) that extract oil from sunflower nut meat without heat or chemicals. The oil is sold in 16-ounce, half-gallon, one-gallon and 2.5 gallon containers (at left) in central Minnesota stores and online.

PHOTOS BY ROLF HAGBERG

BIO-BUI

BY LIZ MORRISON

Blooming Prairie, Minn. — Building products, made by a southern Minnesota extrusion company, have a material difference.

Bio-Plastic Solutions, LLC is manufacturing durable furniture parts and building components from corn-based plastic. The company is one of the first in the nation to use renewable polymers in plastic profile extrusion, a process for making continuous plastic shapes. "We don't know of anybody else doing this for profile extrusion," says Gary Noble, Bio-Plastic Solutions founder and CEO.

The Blooming Prairie firm has produced traditional extruded plastic parts for doors, windows, office furniture and medical devices for a decade. This year the company introduced three new products for the building industry made from BioBest® Bio-copolymer, its patent-pending renewable plastic material.

BioBest furniture edge trim, drywall corner bead, and interior wall guards are made from a blend of corn-starch-derived polylactic acid (PLA) and high-quality, petro-based polymers. The new products contain more than 80 percent renewable biobased carbon, Noble says, and are recyclable.

With AURI's help, Noble's company is also developing extrudable PLA polymers that incorporate crop fibers, for use in building interiors. "We'll look at different ag fibers and particle sizes to see what will work best in their equipment and add strength and heat tolerance," says scientist Al Doering, who heads AURI's coproducts lab in Waseca.

Bioplastics is a new focus for AURI, says project director Denny Timmerman. AURI is working with several state manufacturers and economic development groups to foster this emerging sector. Minnesota possesses "the plant capacity and workforce necessary to develop an industry cluster in the design and manufacture of products from renewable materials," Timmerman says. "We think it's the next step in adding value to Minnesota ag products."

Eight years in development

Bio-Plastic Solutions has invested eight years and more than $750,000 in developing its renewable-plastic components.

Noble, 51, has 30 years of experience in the manufacturing sector, including two decades with Owatonna-based tool maker OTC. In 2000, he became an entrepreneur and bought a distressed plastic extrusion company in Blooming Prairie, his hometown. He built it into the million-dollar-plus business, DiaServe, Inc., now a subsidiary of Bio-Plastic Solutions.

About the same time, Noble began working with several other southern Minnesota entrepreneurs to develop renewable polymers from ethanol byproducts. He thought biopolymers would offer a chance to "differentiate our little extrusion company from all the others out there," says Noble, who was also looking for sustainable products.

That first bioplastics effort fizzled after five years, he says. But by then, Cargill's NatureWorks was supplying renewable PLA

PLA is used primarily for disposable packaging. "We thought there were opportunities to make more durable products from PLA, too," Noble says. "We started with a simple product — edgeband for plywood or particle board furniture. We were working with office furniture companies and picked up on the opportunity."

Working by trial and error, Noble devised a PLA-based material with the physical characteristics needed for furniture edgeband.

"When we were done with a commercial run, we'd do a trial run with a bioplastic blend to test a particular formula, temperature, speed, thickness — all the parameters of our industry." There were some expensive mistakes, Noble says, like the time they destroyed a brand new $8,000 screw. Gradually, "our materials development advanced to the point where we could make more complex products intended to be used for a longer time, like corner bead for sheetrock."

Interest rising ...

There's strong interest in renewable-plastic building materials and furnishings, Noble says. More commercial and residential contractors are pursuing LEED green building certification, he says. Major companies, such as Wal-Mart, Target, Best Buy and Home Depot, are pushing their suppliers to produce more sustainable products. The U.S. Agriculture Department is putting together a "BioPreferred" labeling program for renewable products. Meanwhile, California has passed laws that limit volatile organic compound (VOC) emissions from resins such as PVC, used in consumer products.

Advances in materials science and engineering, higher anticipated oil prices, consumer demands for green products, and environmental regulation are also fostering bioplastic development, Timmerman says.

... but economic climate tough

The construction and building trades have been hammered by the economic downturn, Noble says. "A lot of our customers have seen a 50 their business." Manufactu survive, adding to compet seen his sales revenue fall recession, forcing him to c to 9. All this has made it re launch new products, he s

Still, Noble is convinced th bioplastics will be robust, performance are on par w Recently, for instance, a M BioBest components in tw even talked to us," Noble s our website information."

Markets such as health ca furniture look very promis products contain no PVC or hazardous chemicals, a Bio-Plastic Solutions' proc by several distributors and Forest Specialties of Humb Sustainable Furniture of L

"There are lots of opportu applications," Noble adds. Fergus Falls, for instance, window component with a meets industry standards. AURI will be working with design and testing. "We ar and sectors that are really Noble says. ■

For more information, visit bioplast

A Minnesota extrusion company is developing durable bioplastic building materials

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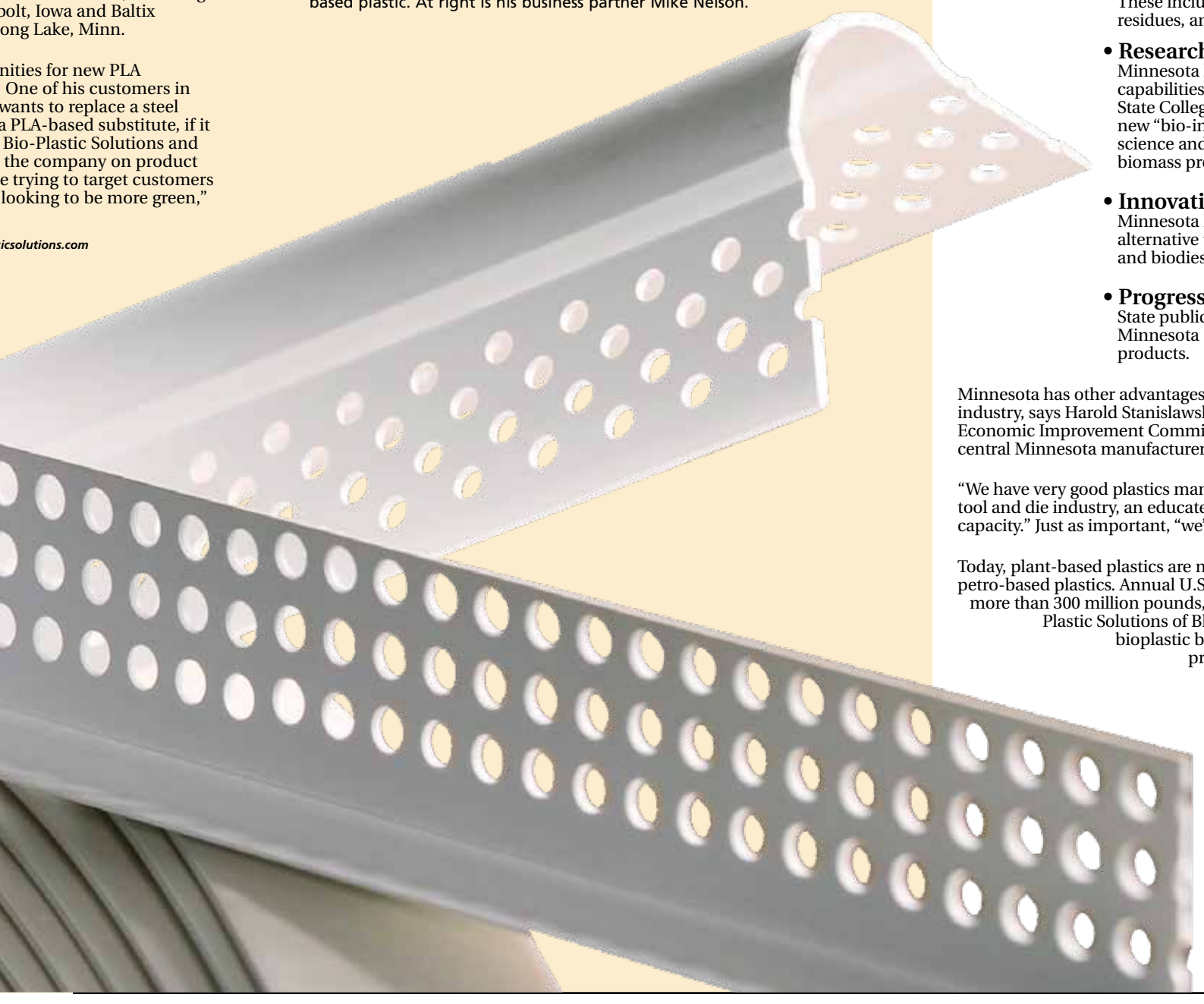
icsolutions.com

PHOTOS BY ROLF HAGBERG

Gary Noble, left, is founder and CEO of BioPlastic Solutions, which manufactures durable furniture parts and building components from corn-based plastic. At right is his business partner Mike Nelson.



Just one word: (bio)plastics

BY LIZ MORRISON

Minnesota could become a leader in the new bioplastics industry, says Denny Timmerman, AURI project director.

The state already has clusters of renewable-materials companies that are converting agricultural products into biofuels, chemicals and bioplastics. The BioBusiness Alliance of Minnesota reports that more than 75 Minnesota academic, private and public organizations are now involved in biomass catalysis and synthesis; more than 80 Minnesota organizations work in materials science. And at least a dozen Minnesota companies, large and small, produce renewable bioplastics and biopolymers.

Minnesota is blessed with many of the resources needed to grow this emerging sector, Timmerman says, including a robust agricultural economy and established materials companies. A recent report from the BioBusiness Alliance of Minnesota, "Destination 2025," tallies some of the state's assets:

- **Abundant biomaterials feedstocks.**
  These include corn, soybeans, forest products, crop residues, and food processing and biofuel coproducts.
- **Research muscle.**
  Minnesota has powerful research and education capabilities. The University of Minnesota and Minnesota State Colleges and Universities are training workers for the new "bio-industries" and making advances in materials science and engineering, genomics, nanotechnology, biomass processing and other life sciences.
- **Innovation know-how.**
  Minnesota has a history of developing innovative alternative uses for agricultural products, such as ethanol and biodiesel.
- **Progressive environmental attitudes.**
  State public policy supports biofuel development and Minnesota consumers are interested in buying renewable products.

Minnesota has other advantages that could foster a renewable-materials industry, says Harold Stanislawski, executive director of the Fergus Falls Economic Improvement Commission. He is leading an effort to help west central Minnesota manufacturers use renewable polymers.

"We have very good plastics manufacturers," Stanislawski says, plus "a strong tool and die industry, an educated workforce, and unused manufacturing plant capacity." Just as important, "we're innovative," he says.

Today, plant-based plastics are no more than a tiny drop in the huge vat of petro-based plastics. Annual U.S. bioplastics production has reached a little more than 300 million pounds, says Gary Noble, founder and CEO of Bio-Plastic Solutions of Blooming Prairie, Minn., which makes extruded bioplastic building components. By comparison, U.S. production of petro-based plastic resins topped 100 billion pounds in 2008, according to the American Chemistry Council.

Some have compared Minnesota's fledgling biomaterials sector to the state's medical devices industry 50 years ago. "The corn and soybean growers have been working to advance biobased materials and bioplastics for many years," Timmerman says. Now, "there are a lot of opportunities. The timing seems to be right." ■

To read the "Destination 2025" report, go to biobusinessalliance.org

Elsewhere in ag innovations

BY DAN LEMKE
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. Please note that ARS is the USDA's research division.

Seeing better with corn

ARS scientists and an international team of researchers have found a way to boost beta-carotene levels in corn that could help prevent blindness and weakened immune systems in children living in developing countries.

Corn contains carotenoids, some of which the body converts to vitamin A. Beta-carotene is the best vitamin A precursor, but only a small percentage of corn varieties have naturally high beta-carotene levels. In Africa and other developing regions, corn is a major staple and many children suffer because corn lacks sufficient beta-carotene.

Researchers have identified genetic sequences linked to higher beta-carotene levels in corn and demonstrated an inexpensive, fast way to identify corn plants that will produce higher levels.

From: USDA-ARS
May 5, 2010

Ancient crop could be sky fuel

Camelina is being investigated by ARS scientists as a bioenergy crop for military and commercial aviation jet fuel. Native to Europe, camelina has been grown since ancient times for lamp fuel and other uses. The seed's high-oil content makes it a promising feedstock for biofuels.

Since 2006, ARS and university researchers throughout the country have been examining how to incorporate camelina and other oil-seed crops into existing crop production systems.

From: USDA-ARS
April 13, 2010

Safety under wraps

An edible film wrap for ready-to-eat meat products delivers a slow release of a naturally-occurring antimicrobial agent that can kill a food-borne pathogen, according to Penn State College of Agricultural Sciences research findings.

Researchers tested a biopolymer film containing antimicrobial sakacin A to control Listeria. The colorless, tasteless film, produced by fungal organisms during fermentation, is resistant to oil and largely impermeable to oxygen.

From: Penn State University
April 8, 2010

Raising the roof

A new soy-based adhesive product is not as toxic, carcinogenic or dangerous as typical hot-applied asphalt roof adhesives. BioBased Elastomeric Bitumen Adhesive (BEBA) is the first cold-applied, biobased-certified adhesive for built-up roofs, the most common low-sloped commercial roof style. BEBA is 28 percent biobased and contains soybean oil and glycerin, an underused coproduct of soy biodiesel processing.

Product developer Lance Niemann of Niemann & Associates says BEBA's cost and performance will be as good or better than similar products that contain petrochemical-based asphalt. According to Niemann, BEBA reduces asphalt use by 50 percent.

From: Biobased Solutions
March 31, 2010

Corn in the bag

Grain in SunChips brand snacks is not just inside the bag, it's outside too. Since April, SunChips multi-grain chips have been sold in 100-percent compostable bags made from corn-based polylactic acid (PLA). The renewable material allows bags to fully compost in about 14 weeks when placed in a hot, active compost bin.

From: PR Newswire
March 31, 2010

Beer for bones

Silicon in beer improves human bone-mineral density, research confirms. Because it can build bone strength, silicon may help people suffering with osteoporosis.

A University of California research team studied the brewing process and raw ingredients' impact on the quantity of silicon entering beer. They found barley products contain more silicon than wheat, likely because the barley husk retains high levels of silica. Just as beer varieties have different taste profiles and attributes, they have varied silicon levels. Pale ales were found to contain the richest amounts of silicon, while non-alcoholic, wheat and light beers contained the least, with less barley present.

From: Journal of the Science of Food and Agriculture
April 22, 2010

NEW FACES AT AURI

Bruce Stockman
Project development director

Bruce Stockman, former long-time executive director of the Minnesota Corn Growers Association and the Minnesota Corn Research and Promotion Council, has joined AURI as a project development director, assisting value-added ventures in southeast Minnesota.

"Most of my career has been in agri-business," says Stockman who grew up on a grain and livestock farm near Topeka, Kansas and now lives in Prior Lake, Minn. He holds a business administration degree from St. Mary of the Plains College in Dodge City, Kansas. After working for the National Corn Growers Association in St. Louis, he moved to Minnesota in 1990.

For 20-plus years serving corn associations, Stockman has been "helping the producer to connect at least some of his or her business further up the value chain," he says, "which is one of the reasons I am excited to be working for AURI." ■

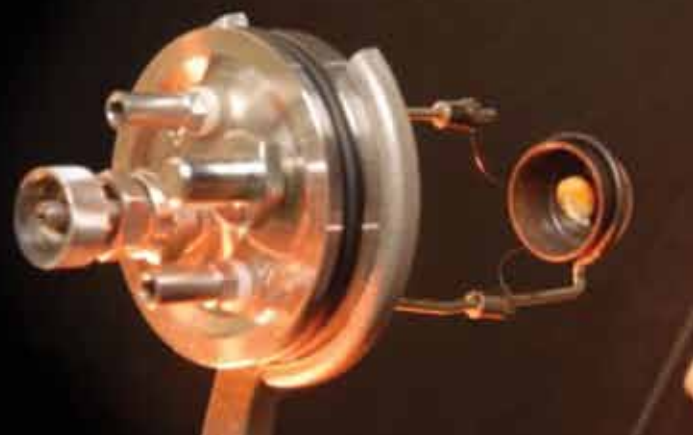
Ashley Harguth
Projects and communications assistant

Ashley Harguth joined AURI's Waseca office in March as projects and communications assistant.

Harguth grew up on a farm near Waldorf, Minn. and holds a degree in agricultural marketing and communications from the University of Wisconsin-River Falls. Her focus is electronic communications, including website maintenance and social media, and she contributes articles to Ag Innovation News.

"I wanted to work for an agricultural company, and I enjoy being able to promote all the innovative things AURI is doing for Minnesota agriculture," says Harguth who lives near Waseca with her husband Steve. ■

AURI upgrades labs and technology



BY EDWARD WENE

AURI is a science-based institute. We offer clients technical assistance and laboratories to put innovative concepts through rigorous testing, analysis, development and scale-up for commercial markets.

Our resources are limited; we can't add every flashy piece of equipment or software that comes out. But we strive to maintain equipment that is up-to-date with industry standards. When technology becomes available that can improve our services, we give it strong consideration.

AURI's specialized laboratories and scientists are located throughout Minnesota to assist businesses and agricultural groups with testing and improving value-added ag products. We focus on areas with the highest development demand: food, bioproducts, bioenergy and coproduct utilization. AURI's labs and pilot plants in Greater Minnesota include:

Fermentation and chemistry lab, Crookston:
is used for microbiology research and for developing and analyzing industrial products. We have added an infrared gas analyzer that measures methane, carbon dioxide and carbon monoxide, a high-performance liquid chromatograph for sugars, acids and other applications, and a gas chromatograph for measuring greenhouse gases.

Food product laboratory, Crookston:
supports the development, nutritional analysis, labeling, scale-up and refinement of new food products.

USDA-inspected meat laboratory, Marshall:
is used for formulating and analyzing animal products, with equipment for developing and testing new products.

Oils laboratory, Marshall:
is an analytical lab for fats and oils used in industrial products, such as biofuels, as well as food and feed. The lab has added a CHN analyzer that uses a combustion chamber to analyze a sample's carbon, hydrogen and nitrogen composition as well as sulfur and oxygen.

Coproducts utilization lab, Waseca:
is used for developing new plant and animal coproduct uses that present environmental and economic opportunities. Focus areas include biomass energy, ag processing byproducts and crop residues. The lab recently added a high-capacity hammer mill, pneumatic material handling system and a pellet cooling system. These systems allow us to do larger trial runs while collecting more and better data. The Waseca lab now has the capacity to measure methane-gas production potential.

Without unlimited funds, it is nearly impossible to have everything that is available for conducting applied research and technology transfer. However, as an innovative organization, it is important for AURI to have the equipment necessary to keep giving Minnesota agri-businesses the information they need to make sound decisions. ■

PHOTOS BY ROLF HAGBERG

Staff profile: Edward Wene

AURI Senior Director of Science and Technology

What is your education background?
University of Illinois undergraduate, master's degree in forestry and Ph.D. in plant pathology.

What are your primary responsibilities at AURI?
To assist AURI clients by determining if our laboratories, or outside technical expertise, can help improve their product or process.

What is the most unique thing about what you do?
I am able to work with a very diverse scientific team within AURI to solve real problems that our clients face.

What role does science and technology play in developing ag products?
Science and technology are key to creating new products, improving existing products and keeping businesses competitive by improving production efficiencies. ■

PHOTO BY DAN LEMKE

U.S. Senator Al Franken, speaking to the Renewable Energy Roundtable on June 4 , says Washington needs to do more to support alternative energy.

Franken keynotes Roundtable event

BY DAN LEMKE

Fergus Falls, Minn. — While describing himself as just "a guy with a vote in the United States Senate," Sen. Al Franken told participants at a June 4 Renewable Energy Roundtable event that more needs to be done in Washington to support alternative energy.

"It's clear that we have to change federal energy policy," the U.S. Senator from Minnesota told the audience of more than 100. "That's why I co-sponsored a five-year extension of the ethanol credit and why I believe it's urgent to pass an extension of the biodiesel production credit as soon as possible."

Franken heard from representatives of Minnesota ag groups that federal policy is needed to provide stability and set direction to build the renewable-energy industry. They told the first-term senator about utilities buying electricity from farmers producing it through anaerobic digestion, about water-quality issues and the need for continued investment in research, development and worker training.

"I am concerned about our long-term deficit," Franken says. "It is penny wise but pound foolish to not invest in research and development. Renewable energy will be a tremendous source of jobs in this country."

"If there was ever a moment in our history where it became glaringly obvious that we are not going to drill our way to energy independence it is now," Franken said, referring to the weeks-long oil leak in the Gulf of Mexico. "This disaster underscores the urgency with which we must develop a new, comprehensive energy policy that relies heavily on safe, renewable energy from rural America."

The Minnesota Renewable Energy Roundtable is a multi-organizational effort to develop an action plan for advancing renewable energy in Minnesota. Focus areas include research, economics and financing, talent development, infrastructure and public policy and awareness.

"It's encouraging to hear from a sitting U.S. Senator about the importance of renewable energy — both from an energy security and economic standpoint," says AURI Executive Director Teresa Spaeth. "We are convinced that agriculture will play a major role in economic recovery and increased energy independence."

"I'm an optimist," Franken said. "There is a lot of work to do, but I have tremendous faith in our ability to innovate." ■

GROWING SELF-SUFFICIENCY

Agronomist develops natural garden fertilizer for low-income families

BY DAN LEMKE

Marshall, Minn. — Mark Altman has covered a lot of turf in his career.

The agronomist has worked in well-known sports venues such as Gillette Stadium, home of the New England Patriots; Coors Field, home of the Colorado Rockies; Qualcomm Stadium in San Diego and Rosenblatt Stadium in Omaha, home of the College World Series.

Now he's using his success to help the less fortunate.

Working with a humanitarian organization in Canada, Altman is developing a low-cost, natural garden fertilizer that will be distributed to low-income families in the United States and Canada. The goal is to help people in need help themselves.

"As far as self sufficiency goes, one of the easiest things people can do is grow their own food," Altman says.

With his wife Sandra, Altman provides consulting services for sports fields, golf courses, lawns, green houses, nurseries, hydroponic operations and effluent-water reuse facilities. Work has taken them to South Korea, Mexico and Canada.

Going global to benefit local

Altman's natural fertilizer will be shipped to Canada for distribution through churches and other participating entities in the United States and Canada. While the end users could be anywhere, the fertilizer uses ingredients from southwest Minnesota.

Alan Doering, AURI coproducts senior scientist, is working with Altman to develop the fertilizer blends with ingredients such as alfalfa meal, feather meal, distillers dried grains, chicken litter and beet molasses. Doering pelleted and crumbled several blends, which Altman tested in growth chambers.

"The blends are good quality, have good nutrient availability and favorable economics," Doering says. "Best of all, the ingredients are all available locally so the economic activity and jobs stay local."

AURI also connected Altman with a southwestern Minnesota manufacturer that will produce, bag and initially ship 250,000 to 500,000 bags of the garden fertilizer.

The AURI project is one of several supported by federal funds through the USDA's Rural Business Enterprise grant program.

The all-natural fertilizer has an NPK value of about 4-1-3 and 8 percent calcium. Altman says if he can bump up the nitrogen content slightly, the blend could have other uses in lawns, roadside seeding and even in organic farming. For now, the fertilizer will be used to help others put food on the table.

"This business has been good to me," Altman says, "so I try to do things like this that are positive and give back." ■

AURI EXECUTIVE DIRECTOR'S COLUMN

Suntava awarded for innovative corn-based dye

BY TERESA SPAETH

AURI likes to reward innovation.

Businesses we work with are developing ag-based products that lead to opportunities, economic activity and jobs. They deserve our recognition.

This year, AURI's annual Ag Innovator of the Year award goes to Suntava. This Minnesota business extracts the natural color Sayela™ from Suntava™ Purple Corn bred by Red Rock Genetics of Lamberton, Minn.

Suntava's natural colorant is in a range of products, from sports drinks to tortilla chips. And company CEO Bill Petrich says they are tapping into markets he didn't foresee — like cosmetics, nutraceuticals and even seed coatings.

Sayela colorant is close to the hue of red dye #40, which is the most prevalent synthetic dye used in U.S. foods and beverages. Since the purple corn handles similar to field corn, it can be dried and stored for extended periods, giving it an advantage over other more perishable natural colorants.

Every year we honor an entrepreneurial company like Suntava that has achieved success in the marketplace — and used AURI's services to get there. We also want to highlight value-added agriculture's contribution to Minnesota's economy.

AURI is driven by and for innovation. It is our role to help move agricultural products into new places and recognize those who accomplish it. For to be truly innovative, a product idea has to be implemented. ■

AURI ag quiz

1. What is unique about Bee-Free honee?
a. It's made from apples
b. It's made from sunflowers
c. It's made by hummingbirds

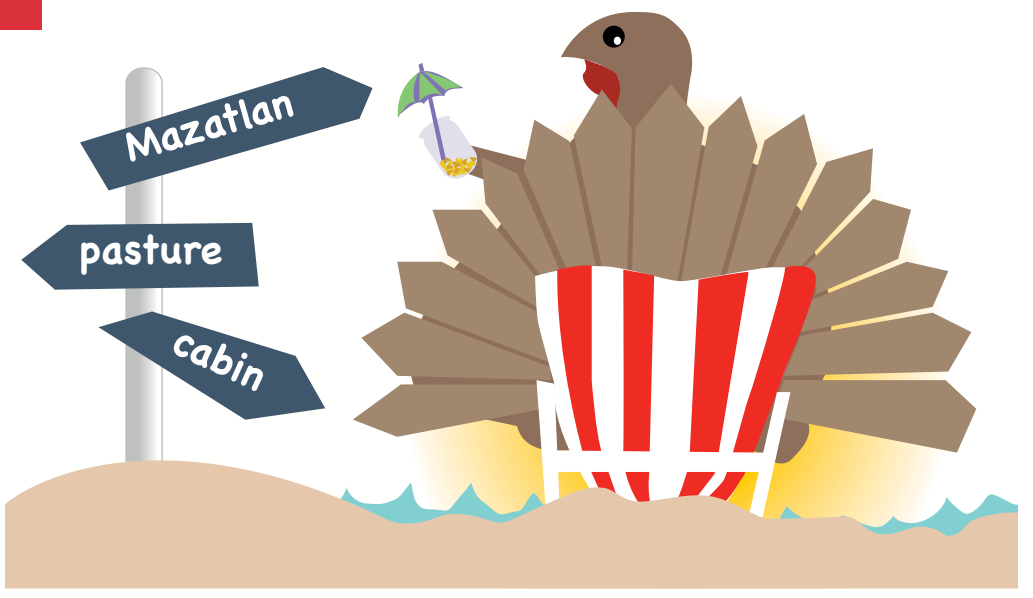
2. Who is the Peterson family's Ferndale Market named after?
a. A Golden Girls character
b. Their grandparents
c. Their dog

3. What weather event prompted Tom Smude to check into raising sunflowers?
a. Drought
b. Flood
c. Tornado

4. What bio-based material is Bio-Plastic Solutions using in its products?
a. Monosodium glutamate
b. Glycerin
c. Polylactic acid

5. What does agronomist Mark Altman specialize in?
a. Hydroponics
b. Sports venues
c. Rain gardens

6. What is one of the biggest hurdles to widespread biomass use?
a. Drying technology
b. Availability of biomass
c. Enough end uses



7. About how many gallons of sunflower oil does Smude Oil expect to produce in 2010?
a. 1,000 gallons
b. 17,500 gallons
c. 40,000 gallons

8. Where do Ferndale Market turkeys spend their winter months?
a. At their lake cabin
b. Out to pasture
c. Vacationing in Mazatlan

9. What annual award was presented to Suntava?
a. Pulitzer Prize
b. Ag Innovator of the Year
c. Siehl Prize

Answers: 1)a 2)b 3)a 4)c 5)b 6)a 7)c 8)b 9)b

ABOUT AG INNOVATION NEWS

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AURI GUIDE TO SERVICES

A nonprofit corporation created to strengthen rural Minnesota's economy, AURI helps businesses respond to market opportunities with new and value-added uses for agricultural goods. The Institute builds working partnerships with business innovators, agricultural groups and researchers, and provides technical support to clients conducting new product research and development.

AURI programs are available to legally-organized businesses or cooperatives with projects that have the potential to create new uses or new markets for Minnesota agricultural commodities. AURI assistance is designed for the early stages of a product's life cycle, while an element of feasibility is yet to be determined.

Project proposals are evaluated on the following criteria:
- Innovation/uniqueness
- Market viability
- Use of Minnesota commodities
- Number of farmer-producers impacted
- Amount of value added from further processing
- Economic impact
- Cost savings

Programs are designed to assist with:
- Identifying emerging value-added opportunities
- Developing innovative commodity-based products
- Developing production processes for feasible products
- Promoting products developed with AURI technical assistance
- Providing resources to bring new products and processes to the marketplace

Assistance may include:
- Access to AURI's scientific and business staff
- Access to laboratory and pilot plant facilities
- Product development and feasibility testing
- Process evaluation and improvement
- Technology transfer and applied research
- Business needs evaluation
- Links to available resources
- Potential for grant funds to qualifying applicants

AURI provides resources proportionate to the project's impact. Smaller-impact projects may be eligible for technical assistance only, while projects with industry-wide impact may be eligible for financial assistance.

AURI Facilities

AURI operates several laboratories:
- Coproducts Utilization Laboratory and Pilot Plant, Waseca
- Fats and Oils Laboratory, Marshall
- Meat Laboratory, Marshall
- Product Development Lab, Crookston
- Fermentation and Chemistry Lab, Crookston

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Dryer technology on display

BY DAN LEMKE

Benson, Minn. — Curious onlookers scrunched in ear plugs to suppress the hum of a diesel generator. It powered a cyclonic dryer that "whirled" moisture out of corn cobs.

The demonstration highlighted an AURI dryer technology event that introduced Minnesota agri-processors to innovative equipment that could help their businesses. It is part of AURI's new Innovation Launching Pads initiative (see accompanying story).

"One of the hurdles that we see, working with agricultural-processing or renewable-energy clients, is the need for efficient drying technologies for crop residues or coproducts," says Alan Doering, head of AURI's coproducts lab in Waseca.

Doering and fellow scientist Kevin Hennessy identified four companies with innovative drying technologies, including cyclone, microwave and membrane systems and a tri-phase, high-efficiency dryer.

Dryer company representatives presented information to more than 40 ag processors at the event. Most were interested in efficient drying methods to help them cut costs and create products.

"This was an opportunity for us to connect Minnesota industry and entrepreneurs with new technology," Hennessy says. Launching Pad forums are a platform for generating, selecting and implementing innovative ideas.

One of AURI's goals, Hennessy says, is to "take technologies off the shelf and transfer them to commercialization for improved efficiencies and increased opportunities." ■

Kevin Hennessy, AURI coproducts scientist, observes a cyclonic dryer demonstration at an AURI Launching Pad event that introduced ag processors to technologies that could improve their operations.

PHOTOS BY DAN LEMKE

Launching innovation

AURI initiative brings businesses, researchers and communities together to launch rural enterprises

BY DAN LEMKE

Innovations aren't accidental. It takes deliberate action to move a concept to the marketplace.

AURI is taking action to drive innovation in rural Minnesota with Innovation Launching Pads. The initiative is designed to bring businesses, researchers and others together to generate, select and, ultimately, implement innovation.

"The goal is to support job creation and retention, and to develop business opportunities in rural areas," says Kate Paris, AURI planning and project development director. "It's an effort to … reverse rural brain drain."

Innovation Launching Pad focus areas include bio-based products, bio-energy, food production and coproduct utilization. The initiative will bring diverse groups together to help identify and address hurdles to implementing new opportunities in those areas.

Launching pads are similar to the AURI-led Renewable Energy Roundtable, which brings Minnesota business, education, research, government and agriculture leaders together four times a year. They meet to identify actions to advance the state's renewable-energy industry.

"It's like particles in a sealed box," Paris says. "The more particles there are, the more likely it is that they will bounce off one another and react.

"If we bring a large group of people together who are all working in bio-based products, for example, there is a better chance that partnerships will develop and ideas become reality because of the shared assets of the group."

"Research shows that an entrepreneur's chance of success depends on their connections," says Jen Wagner-Lahr, AURI project director. Launching pads are designed "to help rural businesses make those important connections," she says.

Innovation Launching Pad events are being held to connect industry-wide projects to businesses that could benefit. For example, a dryer-technology demonstration day in May brought a wide range of ag-processing industry representatives together. (see accompanying story)

Participants learned about emerging technologies that may help them dry their products more efficiently, save money and potentially create new products. After they identified challenges their industries face, AURI helped connect them with resources to improve their chances of success. A similar event to identify food production opportunities was held in late June.

"We want a continual dialog between industry and researchers," Paris says. "Everything we do is focused on generating economic activity and giving Minnesota businesses a competitive advantage." ■