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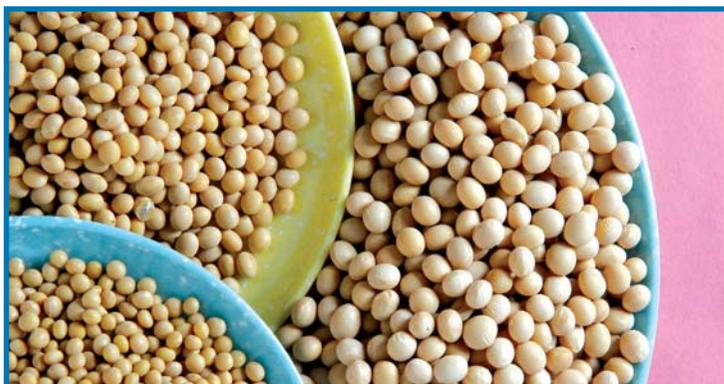


PHOTO FROM THE 1920s COURTESY OF FARIBAULT MILLS

Corn wrap

**Historic mill adds
corn fibers to its
famous woolen blankets**

page 4



Global servings of soy – page 9



Eco-shopping – page 8



Livestock tub treats – page 3

Cause and effect

National energy policy could have major impact on our state

BY EDGAR OLSON

We learn at an early age that everything we do has a consequence — it impacts someone else. It is up to us to make the right choices.

Right now decisions are being made in Washington D.C. that will impact several of Minnesota's most promising value-added agriculture opportunities. Congress is debating a comprehensive energy bill that will set our national energy course for years to come.

The bill includes tax incentives for biodiesel manufacturers that would make it more affordable for companies, including producer-owned cooperatives, to begin refining biodiesel. In Minnesota, we are particularly interested in biodiesel. We worked hard for a state mandate requiring that by next year all diesel fuel sold in Minnesota have a 2-percent biodiesel

blend — if we have enough production.

Many producer-owned enterprises and agricultural groups are seriously investigating constructing biodiesel refineries to meet the anticipated demand and to add value to what they grow. Few of these groups are likely to move forward unless there is some federal support.

Renewable products such as biodiesel have a place in this nation's energy policy. They mean jobs and economic activity for rural areas and energy self reliance for the nation.

Another example of how Washington can impact rural enterprises is a Congressional directive that gives preference to biobased products. The USDA is establishing standards that would require federal agencies to purchase natural-resource-based products unless they are not reasonably

available, can't meet performance standards or are too expensive.

The federal government is a huge customer, spending billions of dollars each year on products for its agencies and the military. Giving preference to biobased not only helps the environment, it could open a large domestic market for Minnesota companies that make ag or forestry-based industrial products.

Whether it's biobased products or renewable energy policy, the right actions in Washington are having a positive effect on rural Minnesota.



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

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AURI: Best wishes to a retiring 'original'

Crookston, MN — After nearly 15 years of service to AURI, Keith Sannes has retired. Sannes, AURI's director of technical services and commercial development, was one of the first employees hired when AURI was established in 1989. He served in various roles out of AURI's Crookston headquarters, including deputy director and field office manager.

"Keith has had a tremendous impact on AURI's past and shaping how we operate today," says Edgar Olson, AURI executive director. "We appreciate all he has done for the organization and for his commitment to Minnesota agriculture."

Prior to joining AURI, Sannes worked as a chemist at General Electric, general manager of Erskine Manufacturing and an instructor at Bemidji State University. He holds a Ph.D. in chemistry from the University of Iowa. ■



Keith Sannes

FILE PHOTO BY ROLF HAGBERG

ABOUT AG INNOVATION NEWS



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Lickin' good

Ethanol producer expands line of livestock lick blocks made from corn distiller's grains

BY E. M. MORRISON

Morris, Minn. — A farmer-owned ethanol cooperative is lickin' up markets for livestock feed supplements.

Since its start-up in 2002, Golden Lyk, a subsidiary of Diversified Energy Company (DENCO), has tripled its production of protein lick blocks made from corn distiller's grains — a byproduct of ethanol production.

Last year, Golden Lyk added 12 new products, including supplements for elk, horses and dry cows. Now sold in all major cow-calf regions of the country, Golden Lyk is benefiting from the strong demand for corn distiller's grains.

The company blends distiller's grains and solubles from its Morris ethanol plant with vitamins and minerals. The mixture, which looks and smells like corn grits, is pressed into 250-pound recyclable plastic tubs.

The lick tubs augment low- and moderate-quality forage diets by providing extra protein, fat and essential nutrients. The result: healthier, better-nourished animals, says Dan Anderson, Golden Lyk manager.

No animal byproducts

Two years ago, Golden Lyk entered the \$150-million lick-block market with three cattle supplements developed with AURI's help. Now the company is making 15 different lick blocks, each geared to specific livestock nutrition requirements. Unlike most competing lick blocks, Anderson says, Golden Lyk tubs contain no feather meal, animal fat or other animal byproducts.

Just introduced: Remuda Lyk for horses, which provides 12 percent protein plus a complete equine vitamin and mineral package, and Elk Lyk — 18 percent protein for elk and other game animals.

Golden Lyk also makes custom-blended tubs to complement specific environments and forages. "Different regions of the country have differing needs," says Duane Rixe, Golden Lyk marketing manager, "and we have responded accordingly."



PHOTOS BY ROLF HAGBERG

In less than two years, Golden Lyk in Morris has tripled its production of protein lick blocks for livestock, served up in 250-pound tubs of corn distiller's grains — a byproduct of ethanol processing at Diversified Energy Company.

The company's standard line now includes 30- and 40-percent protein supplements for cattle, in addition to its 12-, 16- and 20-percent protein formulas. Another supplement offers protein and fat, without added vitamins and minerals, for cattle ranchers who prefer to feed minerals separately.

Improved manufacturing

Besides developing a dozen new products, Golden Lyk has refined its manufacturing. Switching from batch to continuous flow production has boosted processing capacity from 40 tons a day to 120 tons, Anderson says. Turnaround time is now less than a week.

New computer software is better at controlling processing and monitoring product consistency. And lick-block palatability, firmness and appearance were tweaked.

"We've been in the growing stage," Anderson says. These improvements "are helping us to be more competitive. We have the capability now of being very flexible in our manufacturing." Eventually, Golden Lyk hopes to license its patent-pending process to other ethanol plants.

A lickin' good value

Golden Lyk tubs are marketed through a national network of feed salesmen. Ted Gramm, a third-generation cattleman and Land O' Lakes Feed beef specialist, markets Golden Lyk in western Minnesota. He took on the product line after feeding Golden Lyk to his herd during fall cornstalk grazing.

Gramm, 44, and his brother run a nationally-recognized, 550-cow pure-bred Simmental herd near Hancock, Minn., in Stevens County.

Gramm says many cattle producers like the labor-saving convenience of tubs, especially "farmers who don't want to start up the tractor every day" to haul feed. The tubs are recyclable, another convenience farmers appreciate, he says.

Golden Lyk tubs promote optimum nutrition, milk production and calf growth at a good value, Anderson says. "We offer an all-natural protein source as economically as anybody in the industry." Feeding expense ranges from 18 to 30 cents per cow per day, depending on forage quality, he says.

Beyond economics, farmers like feeding a value-added product made from a crop they grow, Gramm says. "Why wouldn't a farmer who grows corn himself like this? It's derived from his own agricultural products."

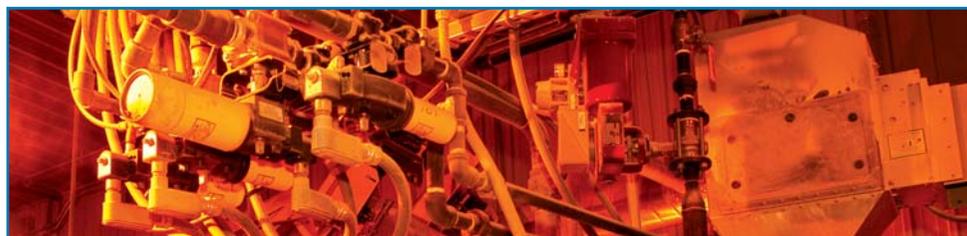
Boost in ethanol profits

Fast-growing acceptance of distiller's grains as a high-quality yet inexpensive feed is boosting Golden Lyk sales. Gramm says his sales jumped from two dozen tubs in 2002 to 700 tubs last year. "More and more feedlot operators are becoming comfortable with using wet cake and dried distiller's grains," he says.

With ethanol's rising production, feared surpluses of distiller's grains have not materialized, Anderson says. "The more familiar farmers are with distiller's grains, the more they accept the tub products," Rixe adds.

Golden Lyk expects to move about 100,000 tubs this year. Anderson says he hopes to eventually market at least 20 percent of DENCO's annual production of distiller's grains, adding up to \$200 per ton to the raw coproduct's value.

"This is a tremendous product," Gramm says. "It even looks nice." And the market, he predicts, "is just starting to open up." ■





PHOTOS BY ROLF HAGBERG

Ingenious Ingeo

SOUTHERN MINNESOTA WOOLEN MILL DESIGNS CORN-FIBER BLANKET

BY DAN LEMKE

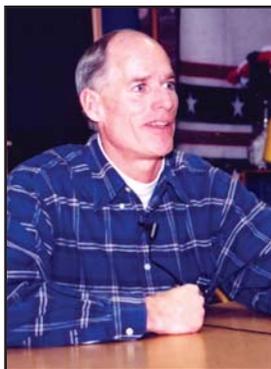
Faribault, Minn. — Setting itself apart from the competition has kept Faribault Mills in business for 140 years. This year, the woolen mill weaved a new pattern into its colorful history with Ingeo™, a patented fiber made from corn polylactic acid.

Deutsch discovery

Faribault Mills President Mike Harris and Chief Operating Officer Dennis Melchert discovered the polylactic-acid fiber in Germany at an international textile show in 2002. Cargill Dow, two companies with a joint patent on Ingeo, were promoting it as a filling. But Melchert, a 30-year Faribault Mills employee, convinced Harris that they should try turning the corn fiber into yarn for blankets. Ingeo, which means “from the earth,” fit with the company’s philosophy of using renewable and recyclable products.

“We began with something that was earth sensitive as a way to replace chemical-based acrylics that were used in some blankets,” Melchert says. After much trial and error, he perfected a fiber-processing method that met the company’s performance standards. “It’s not only earth-friendly, it’s a very good product.” The delicate, silken-textured Ingeo is exceptionally strong, easy to clean and holds dye well.

“We thought we had a product that was pretty darn nice. But at the end of the day, we weren’t really sure how it would be received by consumers,” Harris says. “I’m pleased to say that, first and foremost, people love the blanket ... that it’s made



Mike Harris

from a recyclable, renewable resource is a secondary feature.”

Faribault Mills now makes 100-percent Ingeo and wool-Ingeo blankets and throws as well as its traditional 100-percent wool products. With worldwide rights to make and distribute Ingeo, Harris says the polylactic-acid fiber could yield Faribault Mills as much as a 30- to 40-percent sales growth.

Ingeo is produced by converting corn into sugars. The sugars are fermented and converted to a polylactic acid, which Cargill Dow named NatureWorks PLA. The PLA is then extruded into Ingeo fibers, which arrive at the Faribault mill in bales weighing several hundred pounds each.

Step back in time

The only difference between making Ingeo and wool blankets is the fiber — the production process is the same, and it has changed little over the past decades. Except for a few modern pieces, such as computerized looms, the inside of Faribault Mills looks much like it did 50 years ago. Some of the equipment is older than the employees who operate it. Since it is the only woolen mill left in the country, finding replacement

PHOTOS BY JENNER PENA



At Faribault Mills, wool and corn-based Ingeo fibers are blended (at left), then spun and woven (at right) into fine blankets and decorative throws (above).

equipment isn’t easy.

Wool that comes into the mill is washed, dried, blended, combed, spun, twisted, dyed and woven as it has for generations. The end products — blankets and throws — are marketed by catalogers such as Lands End and Eddie Bauer, and retailers such as

Marshall Fields, Macy’s, Bloomingdale’s and Saks. The mill also produces thousands of promotional products for clients such as Mercedes Benz, Lear Jet, Yahoo, and professional and college sports teams. It also produces fire-safety, stadium and horse blankets.

Faribault Mills uses about 1-million pounds of wool each year, but Harris says the company hopes to double that in the next 12 to 18 months. He also expects to use significantly more Ingeo fiber as Faribault Mills expands its 140-year-old brand. ■

For product and ordering information, visit www.faribaultmills.com

Weaving history

FARIBAULT MILLS IS NATION'S OLDEST AND ONLY REMAINING WOOLEN MILL



PHOTOS COURTESY OF FARIBAULT MILLS

BY DAN LEMKE

Back in 1865, a German immigrant settled in the small farming community of Faribault and began a business carding wool. Carl Klemmer's fledgling company brushed and cleaned wool to be spun and woven by other manufacturers. Before long, Faribault Woolen Mills expanded and began designing cloth, flannel sheeting and blankets.

Today, nearly 140 years later, Faribault Mill stands as the sole survivor of the nation's wool mill industry.

"When you're the last (to survive) it means you're either the luckiest or the dumbest," says Mike Harris, Faribault Mills president and CEO. "I really believe we're the luckiest."



In the late 1800s, there were about 800 other woolen mills across the central United States. Klemmer realized his company needed to be exceptional. By controlling everything under exacting specifications — from wool cleaning and dyeing to designing and manufacturing blankets — Klemmer believed he could make a product superior to his competitors. It was a wise move; Faribault Woolen Mills grew, prospered and built a reputation for quality.

That didn't prevent the mill from falling on hard times.

After decades of success and prosperity, the family-owned business started failing in the 1990s. The company didn't automate its processes and was largely a niche-market player, Harris says. Also, one of the mill's key products — wool airline blankets — suffered a major sales slump from declining air travel that resulted from the Gulf War. In 1998, the Klemmer family lost their business to an investor group, which staved off bankruptcy and closure of the mill.

Harris, a security industry veteran and one of the investors, started running the company in 2001. Two years later, Faribault Woolen Mills expanded into cotton blankets and throws by acquiring Beacon Blankets of Westminster, South Carolina. The combined companies are now known as Faribault Mills.

"We avoided bankruptcy and we're hiring new people," Harris says. "We're making history by working with new fibers and finding new opportunities ... It's extremely rewarding." ■



Robert Klemmer, in this 1965 photo, was a third-generation member of the Klemmer family that owned Faribault Woolen Mill from 1865 to 1998.

Energy Center board named

Seven people representing Minnesota agriculture have been named to the Minnesota Center for Producer-Owned Energy board of directors. Established by a USDA grant to AURI, the Energy Center will assist projects that further Minnesota's renewable fuels industry.

As required by the USDA, the Energy Center board includes representatives from Minnesota's four largest agricultural commodities, two largest farm organizations and the state department of agriculture.

Board members include Jim Boerboom of the Minnesota Department of Agriculture,

Richard Peterson of the Minnesota Corn Growers, Robert Kirchner of the Minnesota Soybean Growers, Richard Schieck of the Minnesota Pork Producers, Patrick Lunemann of the Minnesota Milk Producers Association, Al Christopherson of the Minnesota Farm Bureau Federation and Julie Bleyhl of the Minnesota Farmers Union.

At the Center's inaugural February meeting, Kirchner was elected board chair, Peterson vice chair and Schieck secretary/treasurer.

The Center is expected to begin operating this spring. ■



Kirchner



Lunemann



Bleyhl



Boerboom



Peterson



Schieck



Christopherson

Drilling for northern oil

Hallock area farmers hope to ride biodiesel wave

BY DAN LEMKE

Hallock, Minn. — Kittson County, in extreme northwestern Minnesota, is far from the heart of soybean country where farmers expect to profit from new state biodiesel mandates. Although other oils and greases will work, soy oil is the predominant feedstock for biodiesel.

But that isn't stopping Hallock-area producers from pursuing construction of a biodiesel plant. Hallock Farmers Elevator and its 260 members have partnered with Johnson Oil Company of Hallock to pursue a biodiesel refinery in the area. The group invested \$50,000 in a feasibility study, matched with a \$50,000 USDA Rural Development grant, which will also help develop a business plan.

Interest in biodiesel production has

accelerated since lawmakers passed the "Minnesota Mandate," requiring that all diesel fuel sold in the state contain a 2-percent biodiesel blend by June 2005.

The Hallock producers are beyond casual curiosity. "Once the Minnesota mandate hit the books, we really got interested," says Todd Johnson, vice president of Johnson Oil, an oil distributor. "We didn't want to miss this opportunity without giving it a thorough look."

The evaluation will examine the plant's economic feasibility, including the optimal size and best feedstocks. Given its northern location and available local crops, Johnson expects the biodiesel refinery's primary oil sources to be soybeans and canola. Hallock is only 30 miles from a canola crushing plant.

"We're taking snapshots of different scenarios so we can decide where we want to start," Johnson says. The study's results, expected by mid-summer, will help determine how the project moves forward.

Cold weather and market distance pose challenges to a northern Minnesota facility, Johnson acknowledges. But Hallock is within reach of large markets such as Fargo, Grand Forks and Winnipeg.

"We know that freight is a concern, depending on where the market leads us," he says. "But we know it's a quality product and if we can make it here in northern Minnesota with our weather, it will be a cakewalk to do it elsewhere."

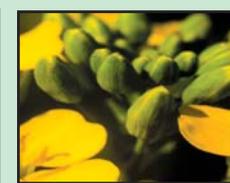
Michael Sparby, AURI project director, says AURI has helped connect the cooperative to available resources and, once the study

is complete, "will take a look at a facility and see if there is enough there to move forward."

Minnesota's mandate — the first in the country — will likely boost biodiesel production throughout the state. But the industry won't reach its full potential until biodiesel incentives are included in a federal energy bill, Johnson says. "Without it, I think the industry will flounder. It's absolutely critical that biodiesel be included in some sort of energy bill." ■



Soybeans



Canola

PHOTOS: ARS

VEGGIE POWER

Low-grade vegetable oils may fuel turbo generators for power plants

BY DAN LEMKE

Minneapolis, Minn. — Flicking on a light switch or firing up the blender may soon come courtesy of a lowly source — vegetable oils.

The Center for Diesel Research at the University of Minnesota is conducting AURI-supported research on vegetable oils' potential as fuel for turbo generators.

Power companies rely on turbines to produce

electricity, especially during peak-demand periods. While classified as a combustion engine, turbines can burn a wide range of liquid fuels — from light No. 1 diesel to heavy No. 6 diesel to natural gas.

Soon vegetable oils, including low-grade soybean soapstock and recycled oils, may join the list of turbine fuels. Some of these oils have little value — just the left-over dregs from soybean processing.

"Turbines are a very forgiving type of engine, which is why we're confident vegetable oils will burn," says Ken Bickel, principal investigator at the Center for Diesel Research. "They can offer the same advantages as biodiesel because they're renewable, reduce dependence on foreign sources and could open new markets for ag products."

Turbines operate by compressing fuel before it is sent to a flame holder. From there, gasses from the burning fuel drive a turbine, which powers a generator to produce electricity.

Unprocessed vegetable oils are cheaper than processed fuels. But characteristics such as the oils' viscosity, metal content and

energy potential aren't yet certain. Bickel is testing to see which vegetable oils meet turbine manufacturers' specifications and are candidates for further testing. Economic issues such as storage, raw material costs and transportation will be considered.

After the oils are qualified, fuel samples will be analyzed and tested in laboratory turbines for emissions and other data. Then they will be tested in small industrial equipment before being readied for the marketplace — with huge opportunity.

Bickel estimates that feeding turbines at two large Minnesota utilities could require 55 to 60 million gallons of oil annually, even though the turbines operate only about 300 hours each year.

"It's potentially a significant market," Bickel says. "(Using vegetable oils) is primarily a potential cost savings for utilities where they can reduce fuel costs by using fuels that are unprocessed."

Price is a primary consideration but environmental issues also factor in. The State of Minnesota has set a goal of producing

10 percent of the state's electricity from renewable sources by 2015. While not a mandate, this target encourages utilities to try renewable energy.

Yet, for vegetable oils to be accepted by power companies, more research is needed, says Max Norris, AURI fats and oils scientist. "No one will give you their turbines unless you can answer the 90 questions they have before you get to that point. We're just starting to answer those questions." ■



PHOTO: DOE-NREL

Large turbo generators used during peak electrical demand may one day be powered with low-value vegetable oils.

MINNESOTA BIODIESEL PREMIERES THIS FALL

BY DAN LEMKE

Redwood Falls, Minn. — Just in time for the harvest, this fall Minnesotans could be filling their truck and tractor tanks with biodiesel — the first produced in the state.

Farmers Union Marketing and Processing Association is sourcing equipment for a biodiesel refinery it expects to open in September at FUMPA's Central Bi-Products rendering plant in Redwood Falls. The refinery's annual capacity will be 2.8 million gallons.

"We anticipate starting with virgin, refined vegetable oils," says Chuck Neece, Central Bi-Products research and development director. "Once the system is refined, we intend to begin using other fats and oils from our rendering operation."

FUMPA has three divisions: Commodity Trading Company, FUMPA Fuels, which will produce the biodiesel, and Central Bi-

Products, a full-service rendering company. Most of the animal materials and feathers processed by Central Bi-Products end up as feed ingredients such as feed-fats, proteins, pet foods, and meat, bone and feather meal. Rendered fats and oils are also suitable feedstocks for biodiesel production.

FUMPA is no rookie on the biofuels scene. Already a member of the National Biodiesel Board, the company has been involved in Minnesota's biofuels industry for years, realizing the value-added potential for the rendering company.

Concern over bovine spongiform encephalopathy (BSE) — mad cow disease — is also spurring interest in new uses for rendered products. Animal byproducts such as meat and bone meal have come under scrutiny as feed ingredients over concerns they may spread the disease.

"We've had general interest in biodiesel development because we are an ag company," Neece says. "We've also been monitoring BSE and how it has affected activity in byproducts. With biodiesel, we would have an outlet for (animal byproducts) if the market reacted negatively to the use of those products (in feed)."

FUMPA will meet about a third of the 8-million-gallon in-state production required before a Minnesota biodiesel mandate can

take effect. Under the mandate, all diesel sold in the state must contain a 2-percent biodiesel blend by June 2005 if the capacity is in place.

Neece says he has been asking area cooperatives how much biodiesel they would be willing to purchase. So far, the co-ops have spoken for 2 million of the plant's 2.8 million gallon capacity.

While vegetable oils, particularly soybeans, are biodiesel's primary feedstocks, AURI fats and oils scientist Max Norris says reclaimed greases and recycled fats also work. "There's room for both at the party. All the fuels have to meet the same standards, it makes no difference the (oil) source," Norris says.

Reclaimed greases may be needed "as we move into fuels with higher percentages of biodiesel," Norris says.

Each feedstock, whether oil from canola, soybeans, animal fats or reclaimed grease, has its "own minor characteristics, some positive and some negative," depending on the blend desired, Neece says.

"What everyone is looking for is a product with long-term stability, good lubricity and suitable cold flow properties." ■



PHOTO BY ROLF HAGBERG

Pumping dairy gas

A prairie community's alternative-energy quest leads to cow-generated methane

BY DAN LEMKE

Morris, Minn. — The city of Morris is no stranger to ag-based power. Corn is turned to ethanol at the Morris DENCO plant, and only 30 miles down the road, poultry litter will generate electricity at the Fibrowatt plant that will be constructed in Benson.

But it's a big dairy herd outside town that could really give the city some gas.

That's the findings of a study commissioned by the University of Minnesota, Morris and the city to assess local alternative-energy potential. The Energy and Environmental Research Center at the University of North Dakota in Grand Forks completed the study in 2002.

The center determined that biomass energy might be feasible for the university campus. But the city's best energy potential is biogas — produced by a manure anaerobic digester.

A dairy 12 miles from Morris happens to be expanding its herd to more than 9,000 animals. Riverview Dairy will produce an estimated 9 to 10 million cubic feet of manure per year, says Ed Larson, Morris city manager. Methane generated by a dairy that size would produce about 50 percent of the energy needed to run the UMM campus, he says.

Methane gas, produced by anaerobic bacteria breaking down manure, could be economically pumped from the dairy into Morris.

"The technology is there because it's being done other places," Larson says. The city is trying to acquire funds to further study and prove the methane-generation plan's feasibility. "At this point we believe it's viable," he says.

Time is a factor, as the optimal time to install the digester and infrastructure to pump the gas is while the new dairy facility is being built.

An undertaking of this size is challenging, Larson admits, but adds that cities and counties have more flexibility than industry to get it done. Cities have access to low-interest loans and can issue municipal bonds to fund projects.

"We already have some potential users,

including DENCO, who are heavy users of natural gas," Larson says.

"We've been told by the legislature that cities need to be creative and innovative. We are trying to do that and establish revenue streams to offset (state) cuts to local government aid."

The city would not only be using a renewable resource, but "stabilizing the price of gas, which would be good for the industry of Morris," says Michael Sparby, AURI project development director. "It would essentially create self-sufficiency within the community," and tie dairy industry growth to industrial development. ■



PHOTO BY DAN LEMKE



Eco-shopping for feds

A Congressional mandate is requiring agencies to purchase more biobased products

BY CINDY GREEN

What do door lubricants, garbage bags, lawn fertilizers, carpet backing and weapons' grease have in common?

All can be made from farm crops — and the federal government buys them in droves.

“Buying eco” is a popular trend in Washington. Now it's the law. A Congressional mandate, part of the 2002 Farm Security and Rural Investment Act, requires that federal agencies give preference to biobased products — if they're available, reasonably priced and perform well. But first, the USDA must establish a workable procurement program.

Selling the government

“A big part of the push for government is to be less dependent on fossil fuels,” says Bob Boyle, a technical sales manager for Cortec Corporation, based in St. Paul, Minn. Cortec makes soy-oil based lubricants, corrosion inhibitors and other eco-products. Company representatives participated in Congressional hearings on the federal biobased-purchasing program. (see story below)

“The government market is huge,” Boyle says.

Congressional intent

Congress set three objectives for the biobased preference program:

- to increase demand for agricultural commodities used in products that would be more environmentally beneficial than fossil-energy-based products;
- to spur rural economic development since products are often pre-processed or manufactured near bulk supplies of raw material; and
- to enhance the nation's energy security by substituting domestically-produced products for those made with imported oil.

Every year federal agencies purchase billions of dollars worth of products that could be made with renewable resources. The federal

mandate requires that all purchases of items (or item groups) that cost more than \$10,000 annually be biobased.

Agencies have “three outs,” says Marvin Duncan, USDA agricultural economist. “If the product is unavailable ... if it does not meet their performance requirements ... if it's much higher in cost, they don't have to buy it.”

Also, a recycled-product mandate — part of the Resource Conservation and Recovery Act of 1976 — takes precedence. “If one has the opportunity to buy biobased motor oils or recycled motor oils, recycled would take preference,” Duncan says. “Of course, if they were biobased recycled oils, there wouldn't be a conflict.”

List of contenders

The USDA is designating generic non-food, non-feed, bio-based items under at least 11 categories. The lubricants category, for example, could include cutting, drilling and

tapping oils, hydraulic transmission fluids, fifth-wheel grease, crank case oils, two-cycle engine oils and other lubricants

Each item will have a bio-threshold — a minimum percent of plant, animal, marine or forestry based material that it must contain. For example, adhesives might have to be at least 70 percent biobased, insulating foams — 15 percent, paints — 50 percent. The intention is to promote products with as much renewable material as possible that are still competitive with petroleum-based counterparts.

“Once we have designated an item, any manufacturer or vendor that deals with that item can go forward marketing their products,” as preferred, Duncan says. The USDA only requires that companies be able to certify their products meet biocontent standards.

“In practical terms, (companies) may be asked about the performance of their product,” Duncan says. “And they may be asked about environmental or health effects.”

Rule making

On December 19, the USDA published proposed standards for the biobased-procurement program; the public comment period ended February 17. The USDA is now reviewing public comments and preparing final rules. “Then we'll designate items as quickly as possible,” which will be followed by another 30-day comment period on the proposed designations. Once final rules are published, federal agencies will have one year to put bio-purchasing systems in place.

The federal legislation includes \$1 million annually for five years to conduct product tests to obtain designation. Public and private labs may conduct the tests.

The USDA is crafting the program to encourage “new market development” and will exclude “mature market” products that gained market penetration before 1972 such as silk, cotton and wool garments, and wood products made from traditionally-harvested timber. ■



PHOTOS COURTESY CORTEC

Cortec Corporation's soy-based corrosion-inhibiting sprays, in “eco pouches” with pressurized air, do not use chemical propellants. The EcoAir sprays could receive special preference by federal government purchasers under new rules designed by Congress and the USDA.

Special privileges

Federal agency purchases will have to shop for more eco-products under a new Congressional mandate. Bioproducts will be preferred over petroleum products in the following categories:

- Adhesives
- Construction materials and composites
- Fibers, paper and packaging
- Fuel additives
- Landscaping materials, compost and fertilizer
- Lubricants and functional fluids
- Plastics
- Paintings and coatings
- Solvents and cleaners
- Sorbents
- Plant and vegetable oils

Marv Duncan, USDA agricultural economist, says this is not the final list. “Other categories will be added as new products emerge.”

Greasing the government

Cortec Corporation knows how to attract government buyers, and its EcoLine is ready made for the new federal bio push

BY CINDY GREEN

St. Paul, Minn. — A U.S. military tank sits in storage for years. In a day's notice, it is ready for battle in a remote desert. The tank is lubricated, corrosion-free, and has a clean fuel line. A plastic coating — like a giant shrink-wrap — along with greases and fuel additives, has protected the machine and kept its engine ready for action.

The protectors are all ag-based products made by Cortec Corporation. The 25-year-old St. Paul company has been selling products to the government for years. In 2002, Cortec representatives testified before Congress in favor of mandating that federal agencies give preference to biobased products. (see story above)

“The government is definitely in our top 10 in sales,” says Bob Boyle, Cortec technical sales manager. The U.S. Air Force is Cortec's single biggest customer; although automotives is its largest industry customer. Cortec manufactures all types of protective fluids including cleaners, cutting fluids, films, sprays and packaging materials. Its EcoLine includes

degradable bags and soy-based greases and fluids.

Despite the feds' “red tape” reputation, “selling to the government can be a very smooth process,” Boyle says. Even though, at times, “it can take forever just to get to the right person, sometimes we will be working on one specific project and it will go through

with no hitches.”

With the new federal program, biobased will be preferred, but “we have to show equivalent performance (with petroleum-based products.) Actually, our soy-based rust preventatives perform better.” When conventional rust barriers are removed from equipment that has been in storage a long time, “it has to be chiseled off. The soy-based (barrier) is easy to remove.”



Bob Boyle

“We want to make sure our products outperform,” Boyle says. “If it takes less time to get equipment ready, it saves time and money. So if (the government) is paying a slight premium, it’s worth it.”

Before the military started buying Cortec’s protective wrap, “they would have to dismantle vehicles before they went into storage ... It could take a week to get them going again.” A plastic wrap requires only dismantling the cable, and when the vehicle is needed, “they cut open the bag, connect the battery cable, attach the antenna and drive.”

Military vehicles can be stored for up to five years, and “we’ve done 10-year preservation methods for the auto industry.”

Cortec also sells Eco Works degradable corn-resin bags to the Department of Interior. “They are used by parks for operating their composting programs,” Boyle says. “It’s an easy way of collecting materials, and you don’t need to de-bag at the compost site.”

“The (degradable) bag is actually stronger” than conventional plastic. Exposure doesn’t cause it to degrade; it’s water-stable, thermally stable.” But left in a compost heap, “micro-organisms will cause the bag to degrade at the same rate as the contents.”

Through the federal bio-preference program, Cortec will be also offering citric- and soy-based cleaners, ethanol and biodiesel stabilizers, and soy-based door and vehicle lubricants, which offer two years of protection versus six months for petroleum products, Boyle says.

When federal agencies start shopping around for more biobased products, “they can focus on the environment if they want — or performance,” Boyle says. “Either way we get good results.” ■



A biobased plastic wrap made by Cortec Corporation keeps a military airplane clean, lubricated and corrosion-free so it is ready for action at a moment’s notice.



PHOTO BY ROLF HAGBERG

World-wise Earthwise

Moorhead grain company reaching global markets with new products

BY DAN LEMKE

Moorhead, Minn. — The international marketplace may be huge and daunting, but that doesn’t mean it takes a dinosaur-size company to reach it. Just ask Earthwise Processors LLC. This small company, owned by six producers, is in its fourth year of selling specialty grains to markets as far away as Tokyo.

And soon Earthwise will be offering several new products — including bread mixes, organic oils and tortilla chips — to its customers in Japan, Korea, Europe and the United States.

“Our competition is global,” including companies “from countries we have never heard of,” says Curt Petrich, Earthwise board president and manager of the company’s processing plant in Moorhead, Minn.

Earthwise markets bulk quantities of identity-preserved, organic and non-GMO grains, such as soybeans, wheat and sunflowers. The producer-owned company also supplies ingredients to manufacturers. “We can sidestep brokers, deal with our customers directly and provide specific products that meet their specifications,” Petrich says.

Since demand has exceeded the supply that Earthwise members can produce, the company contracts with local growers for an additional 40,000 to 50,000 acres — primarily soybeans.

New products, new direction

While bulk grain sales are the mainstay of Earthwise’s business, the company is expanding its line to boost revenues. With the help of a \$95,000 USDA grant, the company is developing three new products.

Premixes, such as bread mix, are being designed for Japanese markets. Because premixes are subject to lower import tariffs than raw commodities or ingredients, they are attractive to exporters.

Earthwise owners also hope to expand their markets for high-oleic sunflower oils, which are considered “heart friendly” and have been shown to help reduce cholesterol.

The company recently took over a company producing organic tortilla chips for European markets. Petrich says they will use USDA grant funds to help improve the chips’ packaging to appeal to more distributors.

Expanding processing

The Earthwise Moorhead plant does not yet have the capacity to process the new products — they will be contract manufactured elsewhere. But in the future, the company hopes to expand and do more of its own value-added processing.

Petrich says the company’s foray into new markets with new products should not only

increase revenue streams, but “will give us a feel for what additional processing involves, give us a taste of the marketplace, let us look around for other opportunities and better serve our customers.”

Petrich says there is already interest from Korean, European and Japanese customers for the new products.

While Earthwise’s markets are primarily overseas, Petrich says domestic markets are not being overlooked. “The U.S. market is growing,” Petrich says. Japanese consumers have a longer history of paying particular attention to their food source so “the Japanese market is mature and they purchase a significant volume. But the domestic markets hold a lot of promise, especially with the growing interest in organic and non-GMO.”

“Earthwise has a proven track record ... building on the diversity of markets they can serve ... and not settling for commodity prices,” says Michael Sparby, AURI project development director. “They’re increasing opportunities for producers.” ■

Ag on the Web

Agricultural innovation centers surfacing

BY JENNIFER PENA

This fall, the United States Department of Agriculture awarded \$10 million in grants to 10 agricultural innovation centers throughout the country — including AURI's Center for Producer-Owned Energy. Each grant recipient is constructing a Web site to report on their mission and progress. Although we are including all the new centers in this section, not all Web sites are up and running. Check back in a couple months. And don't forget to click on AURI's site: www.auri.org for all our latest news and information.

Agriculture Innovation and Commercialization Center

Purdue University, Indiana
www.agecon.purdue.edu/aicc

Purdue University's center shepherds value-added products and processes, from initial idea to value-added enterprise, through education and assessments. The AICC site is attractive, easy to use and worth bookmarking for future reference. Sections include upcoming activities, education materials and information about product development.

Iowa Agriculture Innovation Center

Iowa Department of Agriculture and Land Stewardship
www.iowaaginnovationcenter.com

This site is not yet running, but check back in a few months. The Iowa Agriculture Innovation Center assists producers who are processing, developing and marketing value-added agricultural commodities and products. Iowa leads the nation in corn, soybeans, hog and egg production.

Kansas Ag Innovation Center

Kansas Department of Commerce
www.agecon.ksu.edu/innovation

The Kansas Ag Innovation Center provides specialized business support services, such as business development, bridge management, one-on-one management coaching, education and training. The center will also provide education and outreach programs to help value-added initiatives amplify and sustain their competitive advantage. This site is in progress so check back for updates.

Great Lakes Agriculture Innovation Program

Michigan State University
www.aec.edu/product

This Web site hasn't been activated yet. Michigan State University's innovation program serves Michigan, Wisconsin and Ohio. Services include technical, business, marketing and organizational assistance to clients. AIP's internal work plan includes developing a sustainable organizational/legal structure for three state programs, designing a well-trained professional network of innovation counselors, and conducting rapid-opportunity assessments to guide client-service delivery.



Minnesota Center for Producer-Owned Energy

Agricultural Utilization Research Institute
www.mncpoe.org

AURI's center uniquely focuses on renewable energy and the coproducts of energy production. The Energy Center helps create and support producer-owned, energy-related businesses, offering technical and business assistance. Although the center will serve only Minnesota producer groups during its first year, the long-term goal is to be national in scope. This site is up and running and will soon be updated with staff listings, news and services.

Montana Agriculture Innovation Center

Montana State University
ag.montana.edu/NWARC

Montana's center helps clients define and evaluate their projects, analyze the market, solve technical problems, write business plans and commercialize projects. The site includes general information on the center, research reports and some useful links.

Rutgers University Food Innovation Research and Extension Center

Rutgers, the State University of New Jersey
www.fire.rutgers.edu

This Food Innovation Center provides business and technical services to a variety of constituents, including farmers, cooperatives, start-up food companies, and existing small and mid-sized food companies. Rutgers' center offers business, market, product, process and workforce development services. It also assists with training, regulations, manufacturing issues, quality assurance and food safety systems.

New York Farm Viability Institute: The Center for Value-Added Agriculture

Cornell University, New York
Site not yet named

The New York center wants to help farmers increase the value of their products through on-farm product development, packaging, branding, quality enhancement and business planning. A Web site has not been designed, but some information on the Center is available through the New York Farm Bureau at www.nyfb.org

Agriculture Innovation Demonstration Center

North Dakota Association of Rural Electric Cooperatives
Site not yet named

North Dakota's center will provide technical, marketing and business services to help producers establish businesses that market value-added agricultural commodities or products. The center's purpose is to uncover innovations that could add value to all agricultural market segments. A Web site has not yet been designed.

Keystone Agricultural Innovation Center

Commonwealth of Pennsylvania
Site not yet named

The Keystone Center offers educational and technical assistance to producers, with the goals of increasing agricultural wealth, creating employment opportunities, and providing education and support. The center offers an impressive range of leadership and information expertise to Pennsylvania producers. A Web site has not yet been developed. ■

Elsewhere in ag utilization

BY DAN LEMKE
CARTOONS © UNCLE HYGGLY / POUNCE.COM

Editors note: As a service to our readers, we provide news about the work of others in the ag utilization arena. Often, research done elsewhere complements AURI's work. Please note that ARS is the USDA's research arm.



Chip off the new spud

A new and improved spud may soon be the stuff of your favorite chip. The "Ivory Crisp" potato has been bred by scientists from several universities and ARS to have an optimal starch-sugar balance. Verses higher-starch potatoes, Ivory Crisp is less susceptible to dark spots and burnt flavors that can result from high-temp frying. And the new breed can be stored in a cooler temperature, which helps inhibit rot and other diseases and reduces unwanted sprouting. Ivory Crisp's compact, round shape is also ideal for slicing into chips.

Source: USDA ARS, December 17, 2003

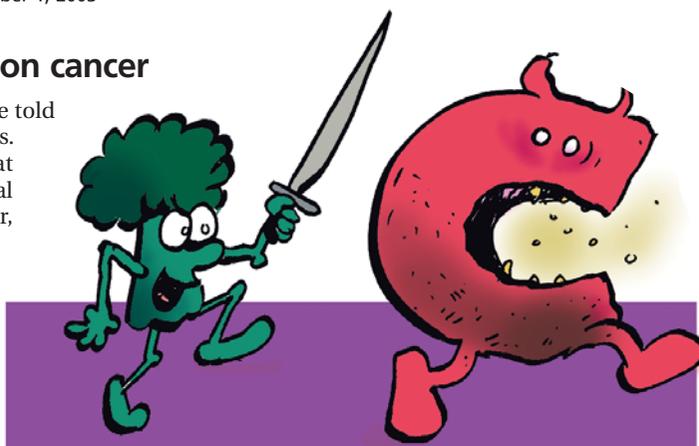
Gimme a soy on the rocks

A fledgling Chicago-based liquor company has hit the market with a distinctive soy-based vodka. Sovereign Brands LLC blends soy and select grains to produce 3 Vodka, the latest entry in the "super premium" vodka marketplace. Unlike traditional vodka, which is easy to distill, 3 Vodka uses a painstaking and secretive process. The soybean is fractionated, with key ingredients stripped out, to form a unique liquid concentrate that is blended with fermented grains to make the finished product. A patent has been filed on the high-tech process. 3 Vodka has a suggested retail price of nearly \$25 per bottle.

Source: Soyatech.com, December 1, 2003

Vegetables take on cancer

Mom knew best when she told you to eat your vegetables. A vegetable derivative that has been used as a natural weapon to prevent cancer, now will be used to treat cancer. DIM, or diindolylmethane, can be extracted from such veggies as cabbage, broccoli, turnips and mustard greens. Research on



mice at the Texas Agricultural Experiment Station shows DIM may inhibit the growth of breast, pancreatic, colon, bladder and ovarian cancer cells with few or no side effects. DIM is already commercially available as a natural supplement to help prevent cancer and treat estrogen-related health issues.

Source: Texas A&M University, December 24, 2003

Stuck on sweets

Sugar is not just for sweet teeth. It's the sticky main ingredient of new, edible adhesives developed by ARS scientists in Peoria, Illinois. The flavorless, food-grade adhesive was developed for a beverage company to use in an assembly line operation that inserts drinking straws into beverage cans, cartons and bottles. The fast-curing adhesive is strong, but dissolves in an even-controlled manner, so straws pop up once the beverage container is opened.

Researchers experimented with 10 different sugars, including sucrose and lactose, and organic acids such as citric acid. Exposed to liquids, the adhesives dissolve and lose their grip in 20 to 60 minutes, depending on the sugar/acid combination used to make them. The patented adhesives can be used in food binding, packaging and drug capsules. They bond to wood, metal, cloth, leather, glass, plastic, paper and other materials.

Source: USDA ARS, December 19, 2003

Feeding frenzy

Aquaculture is one of the world's fastest-growing food production industries. Farm-raised salmon diets contain a 50-percent fish meal and oil blend, which helps produce a flesh quality similar to wild salmon. Since fishmeal supplies are inconsistent and prices variable, University of Saskatchewan experts say processed proteins from soybeans, peas, canola and flax are a viable substitute. Studies show that salmon fed the vegetable protein diet grew at the same rate as those fed fishmeal.

Source: The Western Producer, January 19, 2004

Weed provides "red alert"

A Danish biotech company has modified a mustard weed to change color, from green to red, if its roots detect a landmine gas. The plant may help speed landmine and unexploded-ordnance removal to reclaim areas for farming. Aresa Biodetection used Copenhagen University research to alter the mustard plant so it reacts within weeks when stressed by nitrogen dioxide, which evaporates from landmines. The Red Cross estimates that 26,000 people worldwide are killed or injured every year from explosives left over from conflicts. An estimated 100 million unexploded landmines remain buried in nearly 50 countries. Aresa is also using the technology to detect the presence of pollution from heavy metals in soils.

Source: Agriculture Online, January 28, 2004

Diet may aid food safety

Adding vitamin E to turkey diets may reduce the likelihood of consumers contracting a serious food-borne illness. ARS scientists found that the vitamin stimulates a turkey's immune responses, helping clear the gut of the microorganism that causes listeria. This could reduce carcasses contamination at slaughter and during processing. The research, done in conjunction with Iowa State University and the University of Arkansas, found that vitamin E boosts turkeys' white blood cells, which go into action when disease-causing organisms are detected.

Source: USDA ARS, January 16, 2004

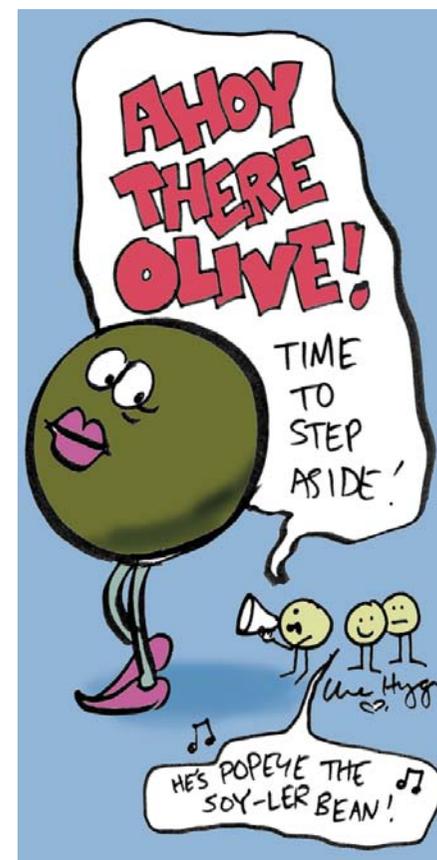
Magic carpet

A Japanese company is spinning corn fibers into carpet. Toray Industries designed a processing technology to manufacture carpet from Cargill Dow's Ingeo polylactic acid fibers. The biodegradable carpet doesn't slip, resists wear and is sufficiently heat resistant to hold dye. The carpet should be available in



the United States this fall and will cost about 30 percent more than traditional carpet.

Source: Soyatech.com, February 12, 2004



Heart-friendly oil

Move over olive oil. The new star of heart-healthy oils could be soybean oil — made from beans that ARS researchers developed from a new germplasm line.

Oil from the designer beans are high in oleic acid, a monounsaturated fat stable enough to use in salad dressings or frying oils without hydrogenation. The hydrogenation or hardening process stabilizes oils so they can be used as solids in margarines, breakfast bars and baked goods. But hydrogenation also creates unhealthy trans-fatty acids.

Oil from the germplasm line has less than half the highly unstable polyunsaturated fatty acids of today's commercial soy oils. PFAs are liquid fats that cause undesirable odors and break down when oxidized by aging or frying at high temperatures. With low PFAs, the oils are as stable as most hydrogenated oils, but do not oxidize as quickly as other soybean oils.

Source: USDA ARS, February 13, 2004

Essential growth

Central Minnesota compost manufacturer expands garden product line

BY DAN LEMKE

Cold Spring, Minn.— Mississippi Topsoils, a company that helps plants grow, is doing some growing of its own.

The premium compost manufacturer is expanding its Soil Essentials line to include potting soil, a planting mix and a top-dressing mix for golf courses and athletic fields. Four years ago, Mississippi Topsoils launched Soil Essentials Premium Compost, made from poultry and forest products.

A diversified product line improves the company's appeal to garden centers and distributors, says Brad Matuska, Mississippi Topsoils co-owner. "As we grow and diversify, these products offer us another outlet."

Mississippi Topsoils uses community tree trimmings and dried poultry processing waste from the adjacent Gold 'n Plump plant. The ingredients are blended in 20-ton sealed bins.

Computers control the entire composting process: mixing waste materials, maintaining optimum temperatures within the bins, recycling leachate and channeling exhaust to reduce odors. Each compost batch cooks about nine months while heat and beneficial bacteria transform the wastes into clean, odorless humus.

Some of the compost is bagged and sold as is, some is blended with peat and perlite to make potting soil, and some with topsoil to make the planting mix.

The Soil Essentials Planting Mix, designed for outdoor and garden use, is available in

40-pound bags and in bulk. The potting soil is available in 1 cubic-foot bags. Matuska says the company could potentially produce 270,000 bags of potting soil and 350,000 bags of the planting mix.

Mississippi Topsoils is also marketing bulk quantities of a compost blend that has been hammer-milled to a fine consistency. It is used as a top dressing for golf courses and sports fields.

Besides increasing Soil Essentials' presence at garden centers, distributing multiple products is more economical than shipping a single product, Matuska says. Currently, about 50 Minnesota garden centers carry the Soil Essentials line, but Matuska expects to add another 25.

"They're following a plan for controlled growth," says Michael Sparby, AURI project director. "Diversifying is an important part of their overall marketing plan."

"Our big marketing push is to establish the Soil Essentials premium product line," Matuska adds. "It's part of our maturation process." ■

PHOTOILLUSTRATION BASED ON PHOTO BY ROLF HAGBEGR

