

Agency Purpose

The Agricultural Utilization Research Institute (AURI) was created by the legislature in M.S. 1160.09. AURI efforts are focused on developing and increasing value added processing opportunities on a statewide basis. This is accomplished by providing project development services and applied scientific assistance in the development of new products and expanded uses for Minnesota agricultural commodities. Assistance is usually provided at the very early stages of product or process development, with a strong emphasis placed on determining overall feasibility. AURI services assist producers and processors to make better decisions about allocating scarce resources.

Mission: To identify new markets and expand existing markets for agricultural commodities, ingredients and products, and to develop new uses or value improvements for Minnesota agricultural commodities.

Core Functions

The Agricultural Utilization Research Institute provides technical and applied scientific services to individuals and organizations that are developing value added businesses across Minnesota. Core functions include:

- ⇒ Providing technical and feasibility assistance, laboratory and pilot plant services in support of the development of value-added processing capacity in Minnesota.
- ⇒ Acting as the applied research and development service for small and medium-sized commodity processors.
- ⇒ Promoting, educating and informing agricultural stakeholders about the rewards and risks of participating in value added processing.

Operations

AURI serves a variety of clients including producers, producer groups, cooperatives, small and medium-sized commodity processors and entrepreneurs. AURI staff assists with project development activities, while laboratory and pilot plant staff support the technical elements of project development. Pilot plant and lab activities assist clients with feasibility, testing, analysis and product scale-up activities.

The economic vitality of Greater Minnesota hinges upon establishing and fortifying key partnerships. This has become a focal point of AURI operations. Enhanced initiatives and collaborations have been established with the USDA, MnSCU, federally-funded SBDCs, MDA, University of Minnesota, DEED and all major commodity groups within the state. AURI staff strives to initiate and integrate these initiatives with processor and producer organizations, "co-ops", to add value and utilize commodities within our state.

AURI's facilities are strategically located throughout the state to enhance service delivery and client access:

- ◆ Crookston: product development lab; state headquarters;
- ◆ Marshall: Center for Producer-Owned and Renewable Energy; fats and oils lab; analytical and process labs; meats lab; and
- ◆ Waseca: co-products utilization lab and pilot plant.

At A Glance

- ◆ Since the year 2000, combined ag and value-added sales have increased over 24%; AURI programs helped support and sustain continued growth and development of value added processing;
- ◆ AURI delivered services to over 400 projects statewide in the past biennium;
- ◆ Presented over 60 producer/processor information sessions on value added opportunities, including: biodiesel, wheat/barley ethanol, oilseeds, meat processing and food safety.

Core Challenges in Operating Environment:

- ◆ Fluctuating commodity prices and high transportation costs necessitate a strategy to support value added processing opportunities at the point of production. AURI projects continue to augment producer income and increase jobs and economic activity throughout Minnesota;
- ◆ Increasing demand for feasibility and product development information for value added processing initiatives;
- ◆ Ever-changing markets and technologies force rural Minnesota-based processors and agricultural enterprises to keep pace or not survive. AURI staff continually increase its professional knowledge base to meet these new challenges and disseminate the information through direct client contact and program presentations.

Program Areas

Client services include project development services, laboratory operations such as analytical, process, meats, fats and oils labs, as well as limited pilot plant operations and development grants for projects.

Industry initiatives focus on broad impact areas and include biodiesel research, ethanol co-products projects, agricultural energy and side stream research, and other feasibility projects that have the potential to impact a large number of producers.

Key Measures

In the past two years, AURI has assisted with the development of value added projects which have enabled more producers to evaluate and participate in processing projects; enhanced the investment potential in new or existing processing facilities; and has led to increased job opportunities in the state. **Key indicator examples include:**

- ◆ Over 20,000 producers impacted through assistance with project feasibility assessment and information;
- ◆ Early-stage project feasibility and assessment services resulting in a combined infrastructure investment potential of \$40 - \$100 million;
- ◆ Over \$8.33 million of outside investments dollars were leveraged by AURI project expenditures for applied research and market development over the past biennium; and
- ◆ Over 1,000 value-added processing jobs from AURI project development and technical services activities, as reported directly from clients.

Budget

The projected budget for FY 2005 is \$4,449,733.12. Current organizational personnel include 14.5 full-time equivalent staff with needs to expand to 21. The additional personnel are needed to perform services related to outside grant awards.

AURI has secured outside sources to replace reduced state funding. At present, the AURI state appropriation is approximately 36% of estimated FY 2005 revenues. These funds are important since they are used to leverage estimated federal and private grants as well as other outside sources of funding. \$2.85 million of leveraged funding is anticipated for FY 2005.

Contact

AURI State Office

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(218) 281-7600

Edgar Olson, Executive Director

The AURI web site, at www.auri.org, provides information on programs, research and contacts in the organization.

Dollars in Thousands

	Current		Forecast Base		Biennium 2006-07
	FY2004	FY2005	FY2006	FY2007	
<u>Direct Appropriations by Fund</u>					
General					
Current Appropriation	1,600	1,600	1,600	1,600	3,200
Forecast Base	1,600	1,600	1,600	1,600	3,200
Change		0	0	0	0
% Biennial Change from 2004-05					0%
<u>Expenditures by Fund</u>					
Direct Appropriations					
General	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200
<u>Expenditures by Category</u>					
Local Assistance	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200
<u>Expenditures by Program</u>					
Ag Utilization Research Inst	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200

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AGRICULTURE UTILIZATION RESRCH

Agency Overview

Dollars in Thousands

	Current		Governor Recomm.		Biennium
	FY2004	FY2005	FY2006	FY2007	2006-07
<u>Direct Appropriations by Fund</u>					
General					
Current Appropriation	1,600	1,600	1,600	1,600	3,200
Recommended	1,600	1,600	1,600	1,600	3,200
Change		0	0	0	0
% Biennial Change from 2004-05					0%
<u>Expenditures by Fund</u>					
Direct Appropriations					
General	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200
<u>Expenditures by Category</u>					
Local Assistance	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200
<u>Expenditures by Program</u>					
Ag Utilization Research Inst	1,587	1,587	1,600	1,600	3,200
Total	1,587	1,587	1,600	1,600	3,200

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Agency Purpose

As the official animal disease control and eradication agency of the state of Minnesota, the board was created over 100 years ago to safeguard the health of the state's domestic animals. In carrying out its mission, the board is part of a network of state agencies protecting public health, and providing an abundant, wholesome food supply to Minnesota.

Core Functions

The Minnesota Board of Animal Health shall protect the health of Minnesota domestic animals (M.S. Ch.35). The board's mission is to protect the health of Minnesota domestic animal populations by preventing, controlling, and eliminating animal diseases.

- ◆ coordinate state and national animal disease control programs;
- ◆ monitor the health of imported animals;
- ◆ identify, locate, and control the movement of infected animals;
- ◆ educate the public about animal diseases;
- ◆ educate and train veterinarians in animal disease control programs;
- ◆ respond to disease outbreaks;
- ◆ coordinate the response to bio-terrorism and other emergencies involving animals;
- ◆ promote public health through animal health programs; and
- ◆ inspect domestic animal facilities to control diseases.

Operations

The board serves a variety of customers. Livestock producers, veterinarians, pet owners, the University of Minnesota Veterinary Diagnostic Laboratory, and the United States Department of Agriculture are the primary customers. Services delivered include: monitoring the movement of livestock and poultry to prevent the spread of disease; responding to disease outbreaks; developing, implementing, and enforcing animal health statutes and rules; and encouraging best management practices for bio-security.

Key Measures

The Board of Animal Health's success is measured by the control and eradication of diseases in domestic animals in Minnesota. The board's success is also measured by its ability to prevent animal disease introductions into the state. The board's reaction to animal health emergencies and disease outbreaks are a measurement of the board's effectiveness.

Budget

The board's FY 2004-05 budget totals \$6.2 million. Board staff includes 27 full-time equivalent employees.

Of the total budget for the biennium, \$5.6 million comes from General Fund dollars; \$1.6 million comes from federal grants.

At A Glance

Animals contribute to Minnesota by providing food, income, recreation, assistance, and companionship to millions everyday. That is why the Minnesota Board of Animal Health has been actively reducing, controlling, and eradicating diseases for the last 100 years.

Program highlights include:

- ◆ Minnesota is a national leader in the control of Johne's Disease in cattle;
- ◆ A program was implemented to eradicate Chronic Wasting Disease from Minnesota farmed cervidae herds;
- ◆ Pseudorabies was eradicated from the state's swine herds in 2003;
- ◆ Minnesota became the first state in the country to eradicate both Mycoplasma synoviae (MS) from turkey breeder flocks and Mycoplasma gallisepticum (MG) from broiler breeder flock.

Contact

Board of Animal Health
119 Agriculture Building
90 West Plato Boulevard
Saint Paul, Minnesota 55107

World Wide Web Home Page:

<http://www.bah.state.mn.us>

Dr. William Hartmann, Executive Director

Phone: (651) 296-2942 ext. 27

Fax: (651) 296-7417

Dollars in Thousands

	Current		Forecast Base		Biennium 2006-07
	FY2004	FY2005	FY2006	FY2007	
<u>Direct Appropriations by Fund</u>					
General					
Current Appropriation	2,803	2,803	2,803	2,803	5,606
Forecast Base	2,803	2,803	2,803	2,803	5,606
Change		0	0	0	0
% Biennial Change from 2004-05					0%
<u>Expenditures by Fund</u>					
Direct Appropriations					
General	2,536	2,986	2,803	2,803	5,606
Statutory Appropriations					
Special Revenue	1	91	46	46	92
Federal	760	924	804	804	1,608
Total	3,297	4,001	3,653	3,653	7,306
<u>Expenditures by Category</u>					
Total Compensation	2,217	2,595	2,434	2,444	4,878
Other Operating Expenses	1,080	1,406	1,219	1,209	2,428
Total	3,297	4,001	3,653	3,653	7,306
<u>Expenditures by Program</u>					
Livestock And Poultry Health	3,297	4,001	3,653	3,653	7,306
Total	3,297	4,001	3,653	3,653	7,306
Full-Time Equivalentents (FTE)	31.6	27.0	27.0	27.0	

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ANIMAL HEALTH BOARD

Agency Overview

Dollars in Thousands

	Current		Governor Recomm.		Biennium 2006-07
	FY2004	FY2005	FY2006	FY2007	
<u>Direct Appropriations by Fund</u>					
General					
Current Appropriation	2,803	2,803	2,803	2,803	5,606
Recommended	2,803	2,803	2,959	2,961	5,920
Change		0	156	158	314
% Biennial Change from 2004-05					5.6%
<u>Expenditures by Fund</u>					
Direct Appropriations					
General	2,536	2,986	2,959	2,961	5,920
Statutory Appropriations					
Special Revenue	1	91	46	46	92
Federal	760	924	804	804	1,608
Total	3,297	4,001	3,809	3,811	7,620
<u>Expenditures by Category</u>					
Total Compensation	2,217	2,595	2,434	2,444	4,878
Other Operating Expenses	1,080	1,406	1,375	1,367	2,742
Total	3,297	4,001	3,809	3,811	7,620
<u>Expenditures by Program</u>					
Livestock And Poultry Health	3,297	4,001	3,809	3,811	7,620
Total	3,297	4,001	3,809	3,811	7,620
Full-Time Equivalents (FTE)	31.6	27.0	27.0	27.0	

ANIMAL HEALTH BOARD

Change Summary

Dollars in Thousands

	FY2005	Governor's Recomm.		Biennium
		FY2006	FY2007	2006-07
Fund: GENERAL				
FY 2005 Appropriations	2,803	2,803	2,803	5,606
Subtotal - Forecast Base	2,803	2,803	2,803	5,606
Change Items				
New Building Lease Costs	0	156	158	314
Total Governor's Recommendations	2,803	2,959	2,961	5,920
Fund: SPECIAL REVENUE				
Planned Statutory Spending	91	46	46	92
Total Governor's Recommendations	91	46	46	92
Fund: FEDERAL				
Planned Statutory Spending	924	804	804	1,608
Total Governor's Recommendations	924	804	804	1,608

ANIMAL HEALTH BOARD

Change Item: New Building Lease Costs

Fiscal Impact (\$000s)	FY 2006	FY 2007	FY 2008	FY 2009
General Fund				
Expenditures	\$156	\$158	\$158	\$158
Revenues	0	0	0	0
Net Fiscal Impact	\$156	\$158	\$158	\$158

Recommendation

The Governor recommends adjusting the General Fund appropriation to the Board of Animal Health to cover the increased lease costs associated with relocation to new buildings near the Capitol in St. Paul. This move will take place during FY 2006.

Background

Laws of 2002, Chapter 393, provided for the construction of joint office and laboratory facilities for the Departments of Health and Agriculture and the Board of Animal Health. It is important for the board to be located with the Department of Agriculture due to the close working relationship needed between the two organizations. The new office building is being constructed through a lease-purchase agreement with the St. Paul Port Authority. The new facilities will meet the increased needs of both departments as well as the board but will require larger lease payments than they currently have in their budgets.

Relationship to Base Budget

The Board of Animal Health currently pays \$85,272 in rent for the location it will vacate in St. Paul. Rent for FY 2006 is estimated to be \$242,000 and for FY 2007 is estimated to be \$244,000.

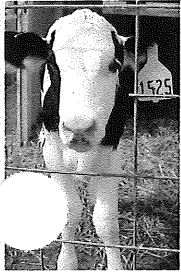
(\$ in thousands)		
	FY 2006	FY 2007
New Rent	\$242	\$244
Base Budget	85	85
Difference	\$156	\$158

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Minnesota

Board of Animal Health

The Minnesota Board of Animal Health oversees numerous voluntary and mandatory programs that focus on controlling and eradicating diseases. The Board works hand-in-hand with state animal industry leaders. A strong line of communication benefits all producers when developing information, programs, and responses. On more than one occasion, animal industry leaders have sought assistance from the Board to limit or reduce the risk of a disease.



Animal Health employees keep a watchful eye on all developing disease situations across the state. Officials monitor any new disease that could be transported into Minnesota from another state or country to prevent serious damage to the industry. Many times preventing that occurrence is easier than controlling a disease once it is in the state.

Animal health officials implement full-scale eradication efforts when a disease has the potential to affect people and/or the economics of the industry.

Some diseases have the potential to widely impact the animal industry. The Board has worked closely with state agencies and livestock organizations to prepare for a wide array of disasters that could impact pets, livestock and their owners.



*Board of Animal
Health*

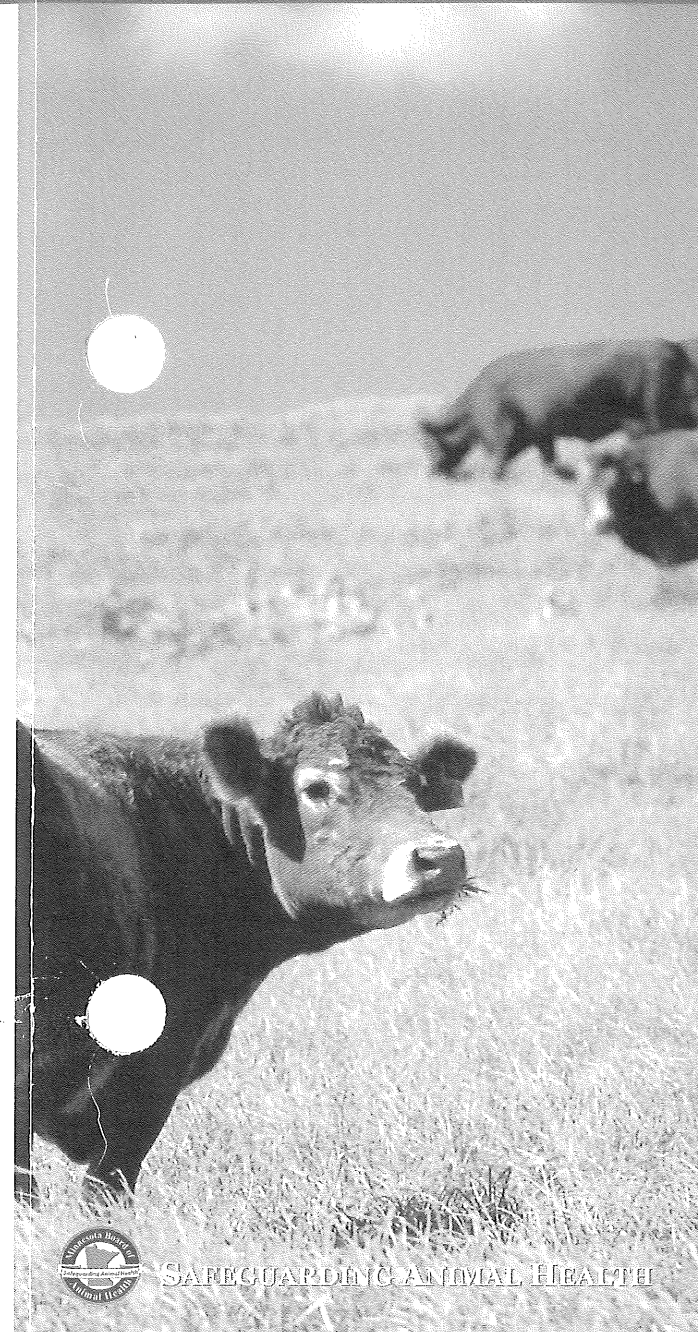
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SAFEGUARDING ANIMAL HEALTH

Safeguarding Animal Health



Animals contribute to Minnesota by providing food, income, recreation, assistance, and

companionship to millions everyday. That is why the Minnesota Board of Animal Health has been actively reducing, controlling, and eradicating diseases for the last 100 years.



As the official animal disease control and eradication agency of the State of Minnesota, the Board was created to protect the health of the state's domestic animals. In carrying out its mission, the Board is part of a team of agencies protecting public health and providing an abundant, wholesome food supply to Minnesota consumers.

Proud Past ... Promising Future

In 1903, lawmakers recognized the value of protecting animal agriculture in Minnesota when the Minnesota Livestock Sanitary Board was formed.

Today, this organization is known as the Minnesota Board of Animal Health. It operates under the direction of a five-member board consisting of livestock producers and veterinarians.

Minnesota animal health statutes and rules are designed to safeguard the health of the state's domestic animals. The Board's team of veterinarians and animal health officials travel to all corners of the state to investigate possible disease outbreaks and advise animal owners about disease prevention.

Protecting Minnesota Animals



The Board oversees numerous eradication and control programs. The following is a partial list of diseases Minnesota animal health officials are working to control.

Avian Influenza (AI)

The Board has helped industry develop a voluntary AI eradication and control program that identifies infected birds, provides controlled marketing methods, and assists in developing disease response plans.

Avian Pheumovirus (APV)

The Board continues to investigate and identify flocks infected with APV. The Board, in cooperation with the U.S. Department of Agriculture (USDA), is using this information to develop a vaccination program that will eradicate the disease.

Bovine Spongiform Encephalopathy (BSE)

The Board is working in cooperation with the USDA to conduct surveillance, complete testing and educate producers and consumers.

Chronic Wasting Disease (CWD)

Deer and elk producers in Minnesota register their animals with the Board and participate in the chronic wasting disease surveillance program.



Emergency Planning

The Board is working with the Minnesota Department of Agriculture to develop plans to respond to foreign animal diseases that could devastate our animal industries. This preparation and planning has helped make the state a national leader in emergency preparedness.

Johne's Disease

The Board has one of the most successful Johne's disease control programs in the country. Board veterinarians conduct free on-farm assessments to identify areas of risk for transmission of Johne's disease. Working with farmers and herd veterinarians, a plan is developed and testing is completed with financial assistance from the Board.



Minnesota Poultry Testing Laboratory

The Minnesota Poultry Testing Laboratory (MPTL) is the state's official lab for poultry disease testing. The MPTL conducts tests that allow interstate and international commerce of Minnesota poultry and poultry products.

National Animal Identification System (NAIS)

The goal of NAIS is to develop a national animal identification and tracking system in the event of a disease outbreak. The Board is working in partnership with the Minnesota Department of Agriculture, the USDA, the University of Minnesota Extension Service, and Minnesota's livestock producers.



Rabies

The Board investigates reported rabies cases that involve domestic animals and quarantines exposed animals to prevent further spread of the disease.



Scrapie

The Board administers the federal scrapie eradication program for sheep and goats.

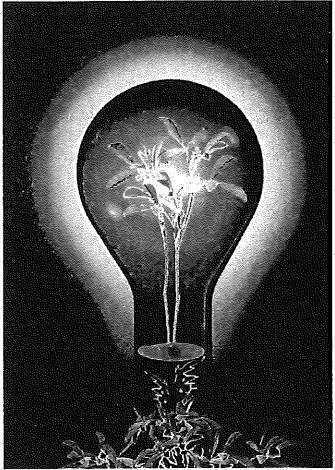


AURI

AG INNOVATIONS

Agricultural Utilization Research Institute

Organizational, outreach and development assistance
AURI's 15-year history in value-added project
development has resulted in a wide range of



experiences in the
area of
organizational and
development
assistance. This
broad-based
understanding is
beneficial in
evaluating the needs
of potential
projects. This
experience also
includes outreach
planning to help

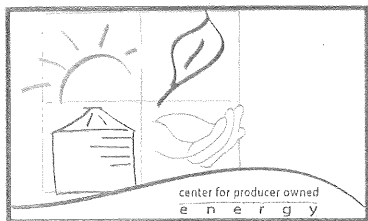
expand awareness. When necessary, the Center
may enlist the help of other organizations versed
in the development of new value added entities.

For more information contact:

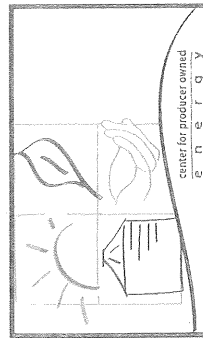
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AURI/Center for Producer-Owned Energy
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Center For Producer Owned
ENERGY



The Center

The Center for Producer-Owned Energy is an independently governed resource affiliated with the Agricultural Utilization Research Institute. The mission of the Center is to support the creation and development of producer-owned value-added businesses related to the production of renewable energy and the utilization and marketing of related co-products and byproducts. Funded through the USDA, the Center enhances the ability of producers to successfully capitalize on emerging markets for renewable energy.



The Center focuses on the development of renewable forms of energy, particularly liquid transportation fuels such as biodiesel and ethanol, and electricity generated from biomass and manure digestion. All are emerging

energy forms that address critical national energy needs, all rely on emerging or rapidly evolving technologies for commercialization and all have potential to make major contributions to rural economies.

In addition, the Center focuses on the development of these businesses through producer ownership. This requires development of human capital in addition to financial resources. While proposed technologies and renewable energy business opportunities could be developed through non-farmer investor owned entities, the Center focuses on providing support and development assistance that fosters producer

ownership. This helps diversify producer's income stream, providing access to increased profit margins while generating and retaining substantial investment in the region where the original commodities are produced.

Services offered by the Center

Many producer-driven ventures are in dire need of hands-on technical assistance at the early stages of viability evaluation. Much of the need is focused on issues that can help organizers make an effective decision on whether or not to proceed. The Center's producer services are tailored to support feasibility analysis.

Technical Assistance

Technical services will focus on and support the creation and enhancement of producer-owned energy opportunities. Potential projects may focus on a new or improved process technology or on development of new value-added products. The project should include an examination of the product's technical soundness and quality. Specific services to be provided include:



Product development assistance: This includes product feasibility testing, process evaluation, access to laboratory facilities, technology development and validation, packaging feasibility and design, prototyping, regulatory assistance, technology transfer and applied research.



Pilot Plant / Laboratory services: Qualified projects will have access to laboratory facilities and accompanying staff to evaluate and enhance processes. AURI facilities are available for product and process development, scale-up and market testing. AURI staff has expertise in broad ranging areas, providing projects with access to vital industry and market experience.

Engineering services: Qualified projects will be eligible to receive engineering services on projects as they relate to production facility layout, prototype development, scale productions, construction layout as well as applied engineering services.

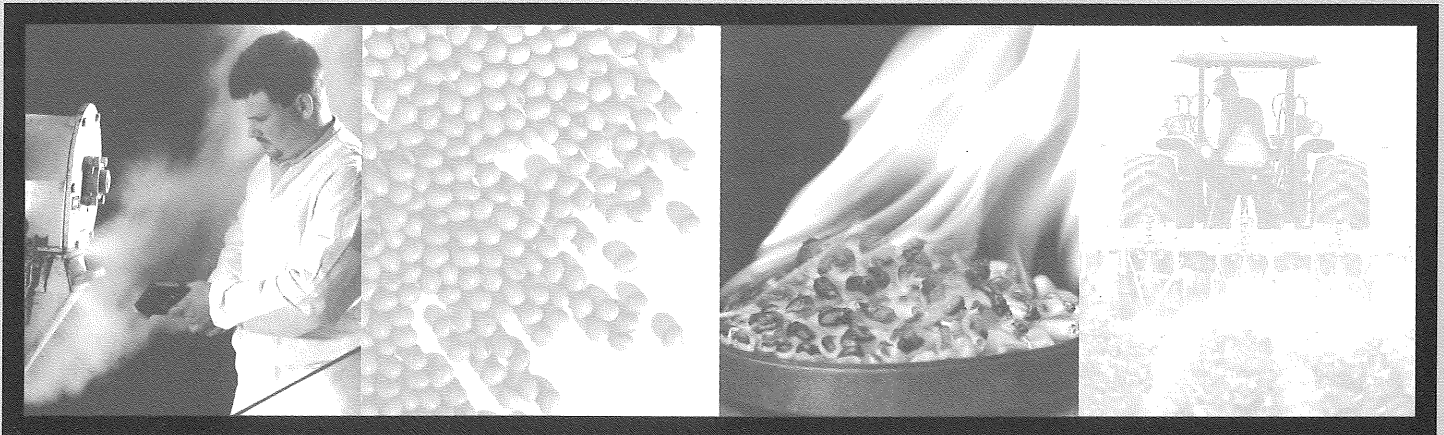
Business Assistance

AURI provides initial business assessment and evaluation. Additional services that will be provided in this area include market assessments, market development assistance and business planning. The Center's assistance will be enhanced through strategic alliances with partnering organizations to best meet the needs of a producer-owned project.

auri

resource guide

2004





aurimission

AURI was created to foster long-term economic benefit through increased business and employment opportunities to rural Minnesota through:

- ◆ the **identification and expansion** of existing markets for new or existing commodities, ingredients and products;
- ◆ the **development of new uses or value improvements** for Minnesota agricultural commodities; and
- ◆ the development of **more energy efficient natural resource** saving production practices.



Agricultural Utilization Research Institute

www.auri.org

auri profile



The Agricultural Utilization Research Institute (AURI) is a nonprofit corporation, funded by the Minnesota State Legislature, created to **improve the economy of rural Minnesota** through the development of new uses and new markets for the state's abundant agricultural commodities. AURI assists commodity groups, agri-processors, farmers, farmer-owned cooperatives and entrepreneurs in the development of innovative, value-added uses for agricultural commodities. AURI provides **expertise and assistance** in order to increase demand and market opportunities for agriculturally-based products.

AURI's focus is on **feasibility and assistance**. This includes examination of technical, business and market feasibility. By providing assistance and needs assessments early in a project life cycle, AURI is able to **help identify the most successful route** for project development.

AURI has scientists and technicians on staff with a wide range of expertise including food product development, coproducts utilization, microbiology and more. With a coproducts utilization lab in Waseca and an oils lab and meat lab in Marshall, AURI is equipped to **help test, develop or refine a variety of products**. Staff work with clients to address their individual needs and advance products to reach emerging markets. AURI expertise and facilities can be accessed by **Minnesota organizations** for no fee, depending upon availability.

In addition to working with projects, AURI also **leads initiatives** which help to identify **emerging opportunities** with the potential to significantly impact producers and commodity consumption.

While AURI provides a **unique package of services**, our work is not done alone. Collaboration with commodity groups, universities, farm organizations, economic development agencies, initiative funds along with federal and state agencies provides AURI clients with a **network of resources** to help them succeed.

About this Resource Guide

The programs outlined in this resource guide are designed to **facilitate adding value to agricultural commodities** and to **foster long-term economic growth**. All projects and their proposed benefits must impact the state, however, the programs are not intended for individual crop or livestock production.

The following pages include information on AURI programs, services and staff. If you have additional questions after reading this guide, please feel free to contact the AURI regional office nearest you. This resource guide and additional information about AURI is available on our web site at **www.auri.org**.

how does auri help?

AURI is a dynamic organization that integrates applied research, product development, technical assistance and business assistance with **unique facilities and scientific expertise**. The resulting one-of-a-kind service is available to assist and support the development of new ag-based products in Minnesota.

AURI assistance includes:

- ◆ **Technical assistance**
- ◆ **Access to staff experience**
- ◆ **Product feasibility testing**
- ◆ **Process evaluation**
- ◆ **Access to laboratory facilities**
- ◆ **Product development assistance**
- ◆ **Technology transfer**
- ◆ **Applied research**
- ◆ **Business needs evaluation**
- ◆ **Links to available resources**
- ◆ **Potential for grant funds to qualifying applicants**



Project Evaluation

AURI assistance is designed to occur **early in a product's life cycle** while there is still an element of feasibility yet to be determined. All requests for AURI assistance are reviewed based upon their **impact to Minnesota agriculture** and to the state of Minnesota. Projects are reviewed and evaluated based upon the following criteria:

- ◆ **Uniqueness:** How innovative or unique is the product or process?
- ◆ **Commodity Source:** Are Minnesota commodities utilized?
- ◆ **Utilization:** How much commodity or coproduct will be utilized?
- ◆ **Producer Impact:** How many Minnesota producers may benefit from the proposed project?
- ◆ **Value Added:** How much value is added to the commodity through further processing?
- ◆ **Economic Impact:** How does the economy of Minnesota benefit from this project?
- ◆ **Cost Savings:** Does the new product/process result in cost savings to producers?

The answers to these questions will determine to what degree AURI can assist a client. Projects that **demonstrate significant impact** are likely to receive more assistance than those showing minimal impact. Some projects may be eligible for technical assistance only, while others may have financial assistance as an option.

auri programs



AURI offers several programs to move projects forward that have the **potential to create new uses or new markets for Minnesota agricultural commodities**. These programs are available to businesses or cooperatives working to add value to farm products. Various programs are utilized based on need. The amount of assistance available is based on a project's **merit and potential impact** to the state's agricultural economy.

These AURI programs are designed to:

- ◆ **Bring value-added products to production**
- ◆ **Assist in developing a process to enhance a feasible product**
- ◆ **Assist in promoting an AURI-supported product**
- ◆ **Identify emerging value-added opportunities**
- ◆ **Provide resources to assist in the commercialization of a product or process**

AURI programs are available to applicants who can **demonstrate that their project will impact** the use of existing commodities, alternative crops or livestock. AURI programs offer assistance for projects or assessments, including:

Technical Feasibility: Potential projects may focus on a **new or improved process technology** or on development of new value-added food or nonfood agricultural products. The project should include an examination of the product's technical **soundness and quality**.

Economic or Market Feasibility: If an applicant has developed an agriculturally-based product or technology, a study may be cost-shared to examine the **market potential or how best to commercialize**. This type of study may identify specific obstacles to commercialization and address potential solutions. Applicants must be an AURI client receiving technical assistance to have access to funding.

AURI technical services: Technologists/scientists are available to provide **consulting and technical services** in the areas of product and process development; product evaluation and testing; sourcing materials, equipment and services.

AURI pilot plants and labs are available for **product and process development, scale-up, nutritional analysis** as well as to **process products for market testing** on a confidential basis.

fats & oils lab, marshall



The primary focus of the fats and oils laboratories is on **valued-added products** resulting in cost effective oilseed processes, feedstocks and product performance in the marketplace. In addition, basic **chemical analysis procedures and methodologies** are applicable to other food, feed and nonfood compositions.

Analytical Laboratory

The analytical laboratory is equipped with both **instrumental and wet chemistry applications** suitable for defining physical and chemical characterization of fat and oil compositions. Typical equipment and allied glassware include gas chromatograph, Mettler Dropping Point, oxidative stability apparatus (OSI), Lovibond Tintometer, refractometer, Soxtec extractor, Cleveland Open Cup, kinematic viscosity, bomb calorimeter, Brookfield viscometer, CEM microwave moisture analyzer, differential scanning calorimetry and HPLC capability. While the primary focus is **support to fat and oil related projects**, these capabilities are applicable to analysis of food and nonfood materials containing carbohydrates, proteins and other minor components. The analytical laboratory can be characterized as a **general chemistry facility** with **resources to provide support** to AURI projects, clients and collaborators.

Process Laboratory

The process laboratory employs both a **wet process area and a chemical processing area**. The laboratory is equipped with reactors suitable for pressures ranging from atmospheric to 500 psi and in volumes of 0.5-1.0 liters and five gallons for scale-up studies. **Research techniques** include esterification, hydrogenation, refining, bleaching, distillation (Rotavap and short path) and deodorization. We also have a bench scale DeSmet crystallizer and membrane filter press for fractionation and extraction studies. Studies requiring preparation of materials by frying (pressure and electrical friers) can also be accommodated.

Formulation Laboratory

Formulations of both food and non-food products are developed in this laboratory. Equipment includes scales, balance, mixers, blenders and product stability analysis at temperatures of ambient, 37 degrees and 100 degrees.

STAFF RESOURCES

Technical staff for this operation include a chemical specialist with organic and analytical specialty, an analytical chemist with food and feed expertise and a scientist with background in fats and oils, appropriate chemistries, foods and non-food applications.

Contact: Max Norris or Jerry Crawford at (507) 537-7440

coproducts utilization lab, waseca



This facility is used for the development of **new uses for plant and animal co-products** that present environmental and economic opportunities. **Focus areas** include development of products or processes derived from agricultural co-products, bio gas, biomass, crop residue, ag fibers, grains and manures. **Product development includes** renewable solid fuels, bio gas for power generation, fertilizers, absorbents and animal feeds. **Services provided at the facility are available to**

farm organizations, producers, commodity groups, cooperatives, agri-businesses and entrepreneurs.

The co-products utilization laboratory in Waseca is a **unique facility**, equipped for small scale product development, limited production runs and can also **accommodate waste products** that have special handling requirements due to bulk or moisture content.

Equipment located on site includes assorted grinders, commutators, a single-screw extruder, pellet mill, fluidized bed dryer and equipment for size grading. The lab is flexible and is designed to accommodate additional equipment that may be necessary for product development.

STAFF RESOURCES

AURI staff is available and trained for product/process development, engineering, as well as operation of all lab and pilot lab equipment.

Contact: Alan Doering at (507) 835-8990

meat lab, marshall

The **meat laboratory in Marshall** is used for formulation and analytical assessment of animal products. This **USDA inspected facility** includes equipment for developing and testing new products. AURI also **helps meat and poultry processors** meet federal regulations and provides Hazard Analysis Critical Control Point (HACCP) training.



Meat Laboratory

The **meat laboratory includes** meat coolers, cutting tables, saws, a patty maker, breading machine, slicer, emulsifier, linkers, sausage stuffers, a smokehouse, ham tumblers, packaging equipment, freezers, clippers, a multi-needle injector and more. This **facility is equipped to handle** animal products from hanging carcasses to the finished product.

Microbiology Laboratory

The **microbiology lab supports other meat lab and animal product activity.** This facility can be used to assist in food handling issues such as HACCP training, sanitation and shelf life testing. Equipment includes a bioluminometer, which is **able to detect sanitation problems** caused by tissue residues and microorganisms.

STAFF RESOURCES

The **AURI meat lab is supported by staff trained** in fresh meat research, animal product development, food product safety and more. This expertise, joined with unique, state-of-the-art facilities, combine to provide valuable services to Minnesota's meat and poultry industries. AURI staff can provide assistance in the lab or on site.

Contact: (507) 537-7440

commodity & industrial ingredients, crookston



AURI staff provides assistance to Minnesota businesses in an effort to increase the utilization of agricultural commodities. In some cases, agricultural products are added as ingredients to existing products.

AURI activities in the area of commodity and industrial ingredients include providing support and guidance to projects that utilize Minnesota-grown commodities for food as well as industrial applications.

Product Development Laboratory

A product development laboratory located at the Crookston office is used in the creation of new food products from concept to finished product. The lab can be used for product creation and product testing. These services are available to Minnesota businesses utilizing ag materials grown in the state.

STAFF RESOURCES

Staff expertise in product development, nutritional analysis guidance and support can be accessed by businesses seeking to create new products or reformulate existing ones. Assistance can be provided for new food items utilizing animal products or grains. Further assistance includes technical consultation, concept analysis, regulatory guidance, labeling assistance, quality control and trouble-shooting. Assistance is available in the AURI lab or on-site.

Contact: Charan Wadhawan (800) 279-5010

Research Laboratory

Also located in Crookston is a lab used for the research and analysis of industrial products and microbiology. This facility is used to support projects that have the potential to introduce agricultural commodities as ingredients for industrial products.

STAFF RESOURCES

Staff expertise in industrial products includes experience in microbiology, fermentation products, biomass characteristics and woody crops.

Contact: Edward Wene (800)279-5010



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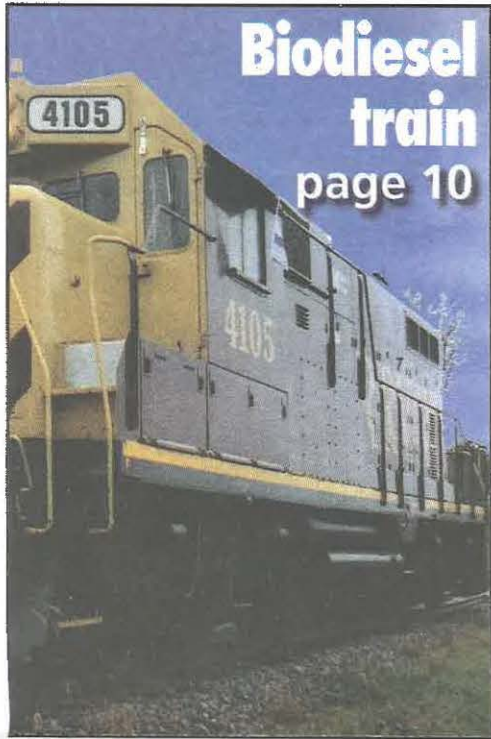
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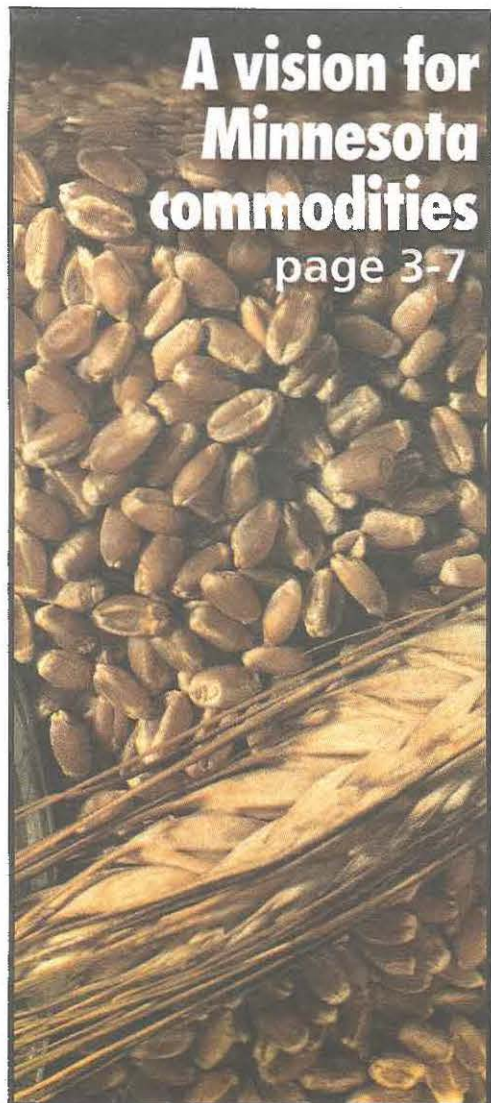
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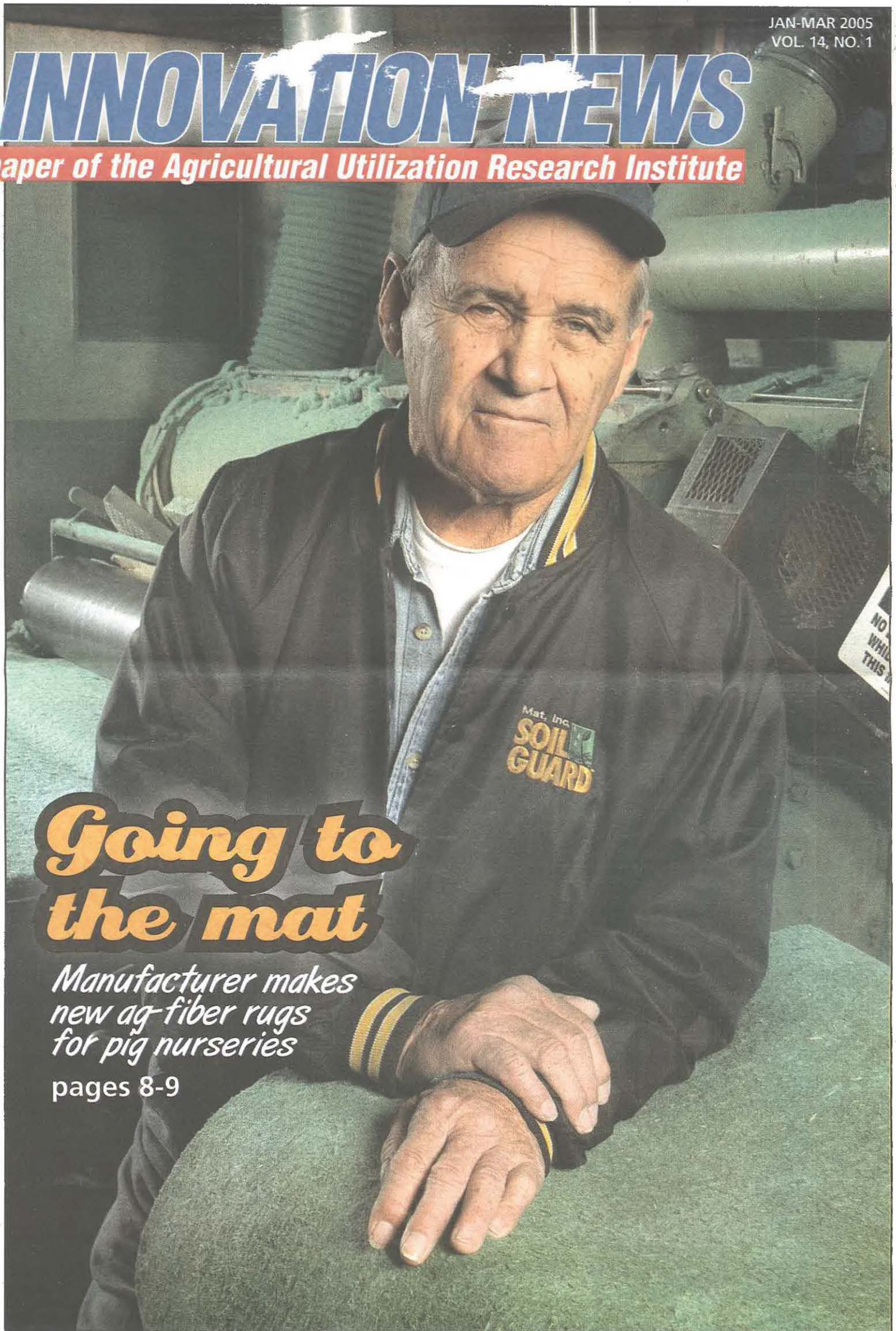
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Going to the mat

*Manufacturer makes
new ag-fiber rugs
for pig nurseries*

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Setting priorities

BY EDGAR OLSON

Most of us learn at an early age that as hard as we try, we can't accomplish everything we want. We don't have enough time or resources, so we make choices. We set priorities.

AURI is no different. There are many directions we could go with the many value-added ideas that come forward. But with finite resources, we have to prioritize. And priorities change as conditions change.

For example, oats covered 28 percent of Minnesota's farmland in 1950, followed by corn at 24 percent and alfalfa at 21 percent. Soybeans were planted on a mere 5 percent.

Fast forward 50 years. In 2000, soybeans were planted on 36 percent of the state's cropland followed by corn at 34 percent and alfalfa at 12 percent. Oats — the state's biggest crop a half century ago — now covers only 1 percent of our farmland. Things can and do change.

To keep pace with change and help producers, AURI maintains important

relationships with Minnesota's commodity and grower groups. They are our best link to large numbers of producers, they know what is important to their industries, and, they have a vision for the future. By providing assistance and research to help producer groups meet their priorities, AURI directly impacts farmers.

In this issue of Ag Innovation News, we take a look at some of the value-added opportunities emerging for the state's commodities. Recognizing these opportunities helps AURI set our priorities to ensure the work that we're doing matches producers' needs.



There are many directions we could go with the many value-added ideas that come forward. But with finite resources, we have to prioritize.



AURI Ag Innovation Quiz

We are adding a little fun and challenge to your reading of Ag Innovation News. After perusing all the information about value-added uses for Minnesota crops, test your recall with the following quiz. Good luck! Hint: If you get stumped, the answers are at the bottom of this quiz.

1. What is significant about Minnesota Prairie Line Railroad's decision to use biodiesel in their locomotives?
 - a. The locomotives actually run on gasoline
 - b. Railroads aren't required to participate in Minnesota's biodiesel mandate
 - c. Biodiesel doesn't work in locomotives
2. How many bushels of Minnesota corn are converted into ethanol each year?
 - a. 50,000
 - b. 152 million
 - c. 60 million
3. About half of Minnesota's barley crop is used to make what product?
 - a. Pretzels
 - b. Pizza crust
 - c. Beer
4. In the 1950's, a Floodwood, Minnesota plant produced fiber-based parts for what U.S. industry?
 - a. Automotive
 - b. Military
 - c. Textile
5. Two new high-value beef cuts — ranch and flat iron steaks — are the result of what innovative research?
 - a. Irradiation
 - b. Marbling
 - c. Muscle profiling
6. How many bushels of corn and soybeans are fed to Minnesota hogs each year?
 - a. 39 million bushels of soybeans, 90 million bushels of corn

- b. 1 million bushels of soybeans, 10 million bushels of corn
- c. 15 million bushels of soybeans, 10 million bushels of corn



ANSWERS:

ANSWERS: 1) b) 2) b) 3) c) 4) a) 5) c) 6) a)

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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Special section:

A vision for Minnesota commodities

To know when you have arrived, you must know where you are going — whether driving a car or running a business.

It takes a plan and a vision to reach your goals.

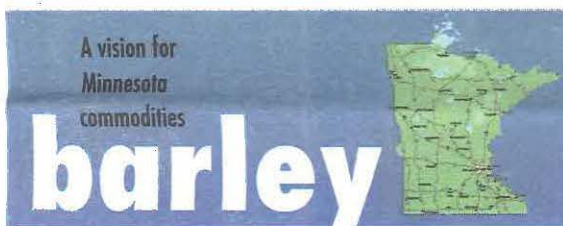
Minnesota's agriculture industry is constantly changing. Prices, weather conditions, even government

programs have an impact on what is raised on Minnesota farms. Despite the variables, ag leaders are staying abreast of new-market opportunities that will sustain demand for their products.

For this special commodity section of Ag Innovation News, we interviewed leaders of Minnesota commodity producer groups — corn, beef, pork, wheat and barley. We asked

about their vision for the future. What new uses are developing for their commodities? What are the challenges and prospects for expanding markets?

In the next issue, we will feature other Minnesota commodities. While producer groups' priorities vary, all are keeping an eye on the future.



Bringing barley back *Barley growers pin hopes on beer, beta-glucan*

BY E. M. MORRISON

Beer and beta-glucan could help revive Minnesota's declining barley industry.

People are drinking more beer in China and Latin America, and that could boost demand for U.S. malting barley. The small grain could also become a major source of beta-glucan, a nutritional supplement touted for its health benefits.

In the past decade, barley production in Minnesota and the nation has plummeted, says Marvin Zutz, executive director of the Minnesota Barley Growers Association, and secretary of the National Barley Growers Association. U.S. barley acreage fell by nearly half between 1990 and 2004, to 4.5 million acres. In Minnesota, the drop in barley acres has been even more dramatic, plunging 85 percent since 1990, to just 130,000 acres last season.

Factors leading to this contraction include more imports from Canada; intensifying export competition from Australia, Canada and Ukraine; a barley disease epidemic in the 1990s; and competition for acreage from more-profitable corn and soybeans.

Barley returns have lagged behind new corn and bean varieties bred for the Northern Plains. In 2003, for example, Northern Plains barley earned an average of \$16 per acre after operating costs

— less than one-sixth the average net return from corn or beans, according to the USDA Economic Research Service.

Genetic improvements, better-yielding short-season varieties, and advances in row-crop machinery "have decreased the risk of growing corn and soybeans on the Northern Plains," Zutz says. Other goals also influence farmers' planting decisions, such as maintaining crop rotations that interrupt pest and disease cycles. Still, he adds, "the corn and soybean belt has moved north and west," supplanting small grains.

Beer exports

U.S. farmers produced 280 million bushels of barley in 2004; Minnesota grew about 8 million bushels. A little over half the crop — most of it grown under contract with maltsters — will be used by the domestic beer industry. Barley that doesn't make malting quality is used for livestock feed. More than 90 percent of the barley crop is consumed in the United States where demand is flat, Zutz says. So, "Our hope for growth is in the export markets."

Mexico and China offer the best export prospects. Beer consumption is booming in Latin America; pushed by "a younger population, income growth and warm

climate," Zutz says. "We're hoping to expand sales to these markets, where we can compete against the European Union in lower freight."

China's growing prosperity has made it the world's largest consumer of beer and the leading importer of malting barley. U.S. barley's superior quality is an important competitive advantage, Zutz says. "They grow malting barley in China,

but it's not as high quality as ours."

Beta-glucan

Barley farmers are also exploring the market potential of barley beta-glucan, a soluble dietary fiber believed to lower

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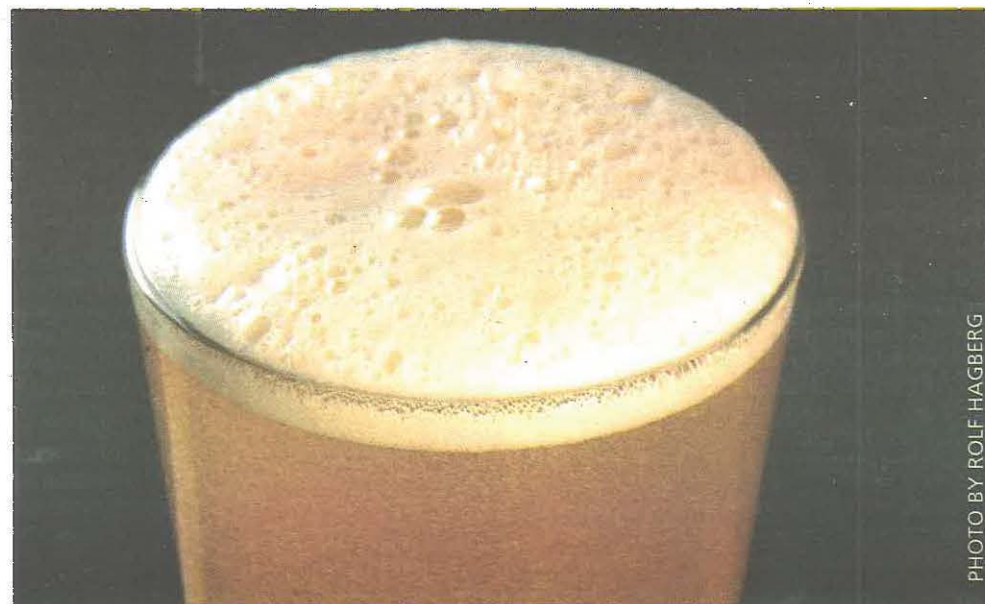


PHOTO BY ROLF HAGBERG

BARLEY from page 3

serum cholesterol, strengthen the immune system and fight tumors. The National Barley Growers Association has been awarded USDA research money to fund clinical trials of barley beta-glucan

at the University of Minnesota and several other research centers. AURI also helped fund the research.

If clinical trials demonstrate the health benefits of barley beta-glucan, growers could be looking at a brand new use for their crop, says Michael Sparby, AURI

project director. Breeding programs to develop high-beta-glucan varieties would likely follow, he adds. "The ultimate goal would be to have a barley beta-glucan processing plant in Minnesota."

In the meantime, barley growers are working to improve yields and manage

profit-robbing diseases. That's essential, Zutz says, in order to maintain acreage and bid for export business. "Barley will have to continue to improve yields to compete with soybeans and corn, or more and more, we'll lose our exports." ■



A 'corn'er on the market

Energy pumps revenue into corn industry

BY DAN LEMKE

In 2003, Minnesota corn farmers produced more than 970 million bushels of corn on 7.2 million acres. Beside food and feed, corn produces tons of biomass that can be used for energy, fiber and industrial products. The corn kernel is processed for high-fructose corn syrup, vegetable oil and even pharmaceutical ingredients.

New uses are continually expanding the demand for and consumption of corn. Yet producers are mindful that they need to keep looking for new opportunities. "Margins continue to get tighter because of rising input costs," says Elbow Lake farmer Jerry Larson. He heads the Minnesota Corn Research and Promotion Council's expanded-uses team.

MCRPC supports projects that develop new uses for corn. AURI has partnered with the corn growers on a number of projects, particularly in developing corn and ethanol coproducts.

Some prime areas for research and development include:

Ethanol

Since the 1970s, when ethanol was in its infancy, Minnesota corn growers have become national leaders in building this alternative-fuel industry. In the state today, more than 152 million bushels of corn are processed annually into 400 million gallons of ethanol. And more production capacity is being built.

Larson says expanding markets for ethanol is a priority, including efforts to increase the ethanol percentage in fuel blends. The council is pressing for the development of more markets for E-85, which is a blend of 85 percent ethanol and 15 percent gasoline. In addition, research is being conducted on an E-diesel fuel mixture, with a 5 percent ethanol addition in petroleum diesel. Larson says the council also promotes using hybrid cars as flexible fuel vehicles.

Ethanol coproducts

Ethanol processing coproducts are a valuable opportunity. Dry distiller's grains are used as a protein source for livestock feed and as an energy source. DDGs contain approximately 8 to 10 percent oil, which not only provides energy to animals but is valuable in biomass fuels. DDGs contain 8,459 Btu per pound and currently compare favorably on cost with fossil fuels. AURI has worked on a number of projects using DDGs as ingredients in pellet fuels.

High-value fractions

The corn kernel and DDGs can be fractionated into oil, fiber and other high-value components such as proteins and amino acids. Those products can be further refined for ingredients used in pharmaceutical and food applications.

Energy from stover

Stover — corn husks and stalks — can potentially be fermented into ethanol or digested to produce methane or incinerated for energy. The fibers can also be converted to glucose or used for pulp to make paper and other products.

Hydrogen

Ag products may play a role in the development of hydrogen as a power source. Larson is dubious that hydrogen will be widely used as transportation fuel in the near future. However, it may be used to power mobile phones and laptop computers and used in military applications, he says.

Genetics

Genetic research is important to value-added development, Larson says. By breeding corn varieties with traits for specific end uses, product development can be more efficient. For example,

highly-fermentable starch hybrids can produce more ethanol per bushel.

A look ahead

"There are real opportunities for new corn-based development in energy, food products, biofuels, you name it ...

We're just scratching the surface," says Al Doering, AURI technical services specialist in Waseca.

Some products may take years to develop; others may never become viable. But it's important to keep looking ahead, Larson says. "Research has led to new economic development in this state ... that's where the future is." ■



PHOTO BY ROLF HAGBERG

A vision for
Minnesota
commodities

wheat



Bred for bread

Genetics and coproducts could help a wheat industry facing serious challenges

BY E.M. MORRISON

Wilkin County, Minn. — Galen Affield used to plant spring wheat on half his 1,500 acres in west central Minnesota. But now, it's mostly soybeans and corn — on his farm and many others in the traditional wheat-growing Northern Plains region. "Who ever thought we'd be raising 150-, 160-bushel corn up here?" says Affield, who has been farming since 1973.

The U.S. wheat sector, which produced 2.1 billion bushels of grain in 2004, is facing tough challenges, says Affield, vice-president of the Minnesota Association of Wheat Growers and a director of the National Association of Wheat Growers.

Wheat acreage has dropped nearly a third since 1981. In Minnesota, seventh nationally in wheat production, acreage fell to 1.65 million acres in 2004. That's "one of the lowest in about 30 years," says Dave Torgerson, executive director of the Minnesota Association of Wheat Growers.

Lower profits than corn, beans

Why the decline? Wheat has been less profitable than corn and soybeans, Torgerson and Affield say. In 2003, for example, Northern Plains wheat returned an average of \$63 per acre after operating expenses, according to the USDA Economic Research Service. Corn returns averaged \$91 and soybeans, \$113.

Lower returns have discouraged investments in research and breeding, so there has been little improvement in wheat yields, Torgerson says. Meanwhile, the corn and soybean industries have made rapid genetic advances, producing varieties that can be planted farther west and north in traditional wheat-growing regions.

When an epidemic of Fusarium head blight, or scab, struck in the 1990s, many Minnesota wheat growers switched to new corn and soybean varieties — with good results, Torgerson says.

Market share slipping

Adding to wheat's woes, domestic use has slipped as consumer food preferences change and low-carbohydrate diets flourish. U.S. wheat consumption has declined from 147 pounds per capita in 1996 to 136 pounds in 2003, the USDA reports.

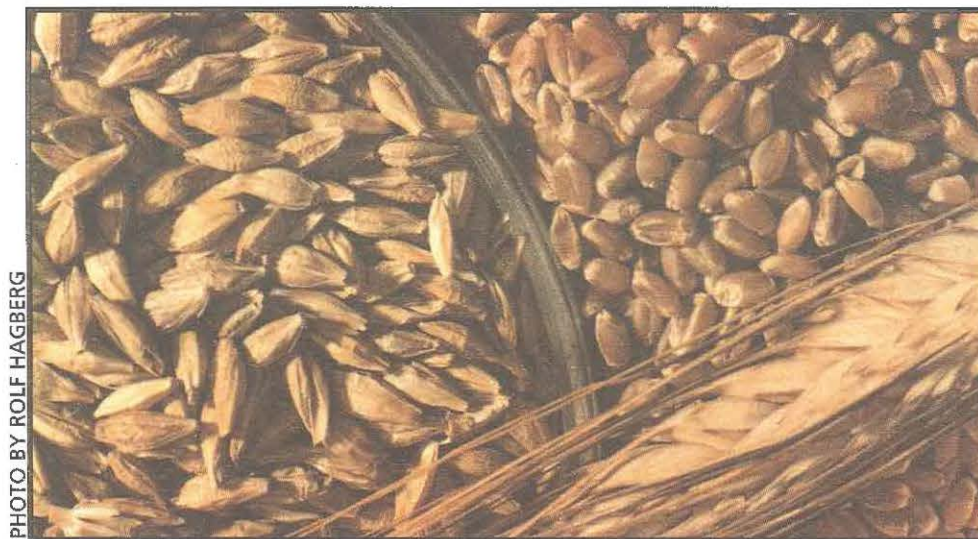


PHOTO BY ROLF HAGBERG

Bread preservation technology is improving, too, doubling and even tripling the shelf life of a fresh loaf. That means less flour use.

American producers also face intense foreign competition for export markets. "The whole world raises wheat," Affield says. Australia, Argentina and Canada are increasing their exports, and the European Union, Ukraine and Russia are adding to export pressures. Even though world consumption is rising, the United States' share of the global wheat trade has fallen by one-third since the 1980s, to about 30 percent, Torgerson says. "Historically, the U.S. exported about 60 percent of the wheat crop." Today, it's a little less than half.

Responding to low returns, falling domestic consumption, and eroding export share, farmers in America's Bread Basket are turning away from wheat. But Affield says wheat's outlook could brighten with improved genetics, new uses for wheat coproducts, and identity-preserved marketing.

New food products

Most U.S. wheat is milled into flour. That's no surprise for a grain that, for thousands of years, has been "bred for bread," Torgerson says. Three-fourths of all domestic grain products are made from wheat flour, according to the Wheat Foods Council.

AURI has worked with dozens of Minnesota entrepreneurs on new wheat foods, says Charan Wadhawan, AURI's cereal scientist. Snacks, breads, desserts, meat substitutes, and lots of other foods containing wheat have been developed and tested at AURI's Crookston food lab. Many of these new products have found successful markets, Wadhawan says.

Cat litter

The wheat industry hasn't had the same success as corn and soybeans in developing new industrial products.

One exception is cat litter — pioneered in Minnesota.

Pet Care Systems of Detroit Lakes produces Swheat Scoop Natural Wheat Litter, a scoopable, flushable kitty litter made from nonfood-grade wheat.

Natural wheat enzymes control litter box

National wheat growers identify value-added opportunities

A 2002 report from the National Association of Wheat Growers outlined opportunities for adding value to wheat. Recommendations included possible new or improved uses, products, and grain traits. Among the potential opportunities identified:

- Wheat (Weiss) beer
- Aquaculture and turkey feed
- Meat substitutes
- Cat litter
- Low-carbohydrate wheat varieties
- Non-allergenic varieties
- Hard White and Waxy varieties
- Wheat-straw composites
- Ethanol from straw or middlings

To read the full report, go to www.wheatworld.org

odors. Wheat starch clumps firmly. And wheat litter is safe for plumbing. AURI worked with the start-up company for a decade on product development and manufacturing. Swheat Scoop, now co-owned by Farmers Union Marketing and Processing Association of Redwood Falls, is sold in pet stores and retail chains nationwide.

Straw for wood

Wheat coproducts — especially straw — may also have industrial potential, says Michael Sparby, AURI project director. Minnesota wheat growers are already supplying straw to a North Dakota company that makes pressed straw board.

The Minnesota Biofibers Consortium, a coalition of farmers, researchers and private companies, is exploring ways to substitute straw and other ag fibers for wood pulp. And scientists at the University of Minnesota are developing refining methods for many plant fibers, including wheat straw.

Genetic improvements

In the near term, Minnesota wheat growers are focusing on production improvements and disease control. "There's a lot of effort to increase yields, to make wheat more competitive with other crops," Torgerson says. In Minnesota, wheat yields were up in 2003 and 2004 and "we're turning the corner on scab," he says. "If we can string together a few good years, growers will be more confident about raising wheat."

The wheat industry is also focusing on genetic improvements. New varieties with disease resistance, high protein or better baking qualities could raise profits and lift demand, Affield says. Hard White Wheat, for example, yields more flour per pound and earns a premium.

Wheat growers are moving cautiously in this arena, though, to avoid endangering sensitive export markets. Herbicide-tolerant wheat varieties have been developed, but not released, Affield says, because of fears that bio-tech wheat "would not be acceptable to foreign markets."

Still, Torgerson says, in the coming years, "we think there will be a lot more identity-preserved wheat grown for specific end users, with the particular traits they need." At the same time, he adds, the wheat sector will need to develop marketing and distribution systems to segregate identity-preserved wheat. ■

A vision for
Minnesota
commodities

pork



BY DAN LEMKE

Minnesota may not be top dog in hogs, but it's close. Ranked third in the nation in overall production, the Gopher state produces 14 million hogs a year — about three for every Minnesotan.

That's good news for grain growers, too. Minnesota hogs are eating up more than 39 million bushels of the state's soybeans and 90 million bushels of its corn. In addition, more than 22,000 Minnesotans owe their job to the pork industry, the Minnesota Pork Board estimates.

But the industry isn't ready to stand still. To advance and grow, the Minnesota Pork Producers Association is focusing on a number of new opportunities opened up by technology and changing consumer tastes.

Swine of the times

Adapting to changing consumer tastes and energy markets could boost an already strong pork industry

Energy

Fourteen million hogs produce plenty of waste, which is now used exclusively for fertilizer. "From an environmental standpoint, we are always looking at new technology for manure handling," says Dave Preisler, executive director of the Minnesota Pork Producers Association. "That could involve changing the physical characteristics, to the generation of energy."

AURI receives frequent inquiries about anaerobic digesters used to generate methane gas for heat or electricity from solids such as hog manure. Alan Doering, AURI technical services specialist, says that with the number of animals in the state and the amount of manure

produced, digesters may be worth considering.

"Since hog manure has a lower solid content than dairy waste, hog manure isn't a viable option right now," Doering says. "But as technology changes and we continue to look at this, there may be some opportunities down the road. We're not there yet, but it certainly could happen."

Changing consumers

The American landscape is changing. Ethnic populations are growing and shifting, creating new opportunities to market pork products.

"The industry needs to react to changing demographics," Preisler says. "We need to

put pork in a form that will maintain and increase consumption."

Preisler says people in many cultures eat pork. But they may want different cuts from different breeds. For example, some southwest Minnesota farmers are raising Berkshire hogs for Japanese consumers who prefer the darker red meat with more marbling than typical American pork.

Convenience Foods

The traditional family sit-down dinner is not as common today in America's busy households. "We're seeing more dual-income families, they're in a hurry and they want to cook something quick." By developing more convenience items,

A vision for
Minnesota
commodities

beef



Beefed-up industry

Technology improves low-value cuts, convenience and food safety



PHOTO BY ROLF HAGBERG

BY DAN LEMKE

Minnesota's beef industry is a \$1.9 billion business — a significant player in the agricultural industry. Like other ag segments, beef producers depend on increasing demand for their products to keep the industry strong.

Beef cattle are raised on nearly 16,000 Minnesota farms; another 9,000 have dairy herds. With about 2.5 million cattle produced annually, Minnesota ranks 10th in the nation.

While most beef is for human consumption, there are new market opportunities.

AURI's meat lab in Marshall, Minn. is devoted to new product development, microbial testing and food safety training. "The meat industry affects more than just livestock producers ... it is important to grain farmers and local communities," says Dennis Timmerman,

AURI project development director. "It's important for us to do what we can to help."

Beef industry developments are led by the Minnesota Beef Council, which uses producer check-off dollars to educate consumers and promote value-added opportunities.

Some of the emerging opportunities include:

Low-value cuts

The Beef Council estimates that 40 to 45 percent of U.S. beef is consumed as ground beef. Tougher cuts are best marketed as ground; however, technology and research are helping to make some low-valued cuts such as chuck and round more desirable as steaks or roasts, says Ron Eustice,

executive director of the Minnesota Beef Council.

New "muscle profiling" research is helping determine individual cuts' tenderness. Certain cuts, such as flat-iron and ranch steak "have been identified to be desirable and can be marketed as value-added products," Eustice says.

Pre-processes, such as the Rinse and Chill vascular flush technique patented by MPSC, Inc. of St. Paul, can also help tenderize lower-value cuts and improve meat safety.

Selling convenience

Finding time for a home-cooked, sit-down dinner is becoming increasingly difficult for American consumers, but they still have to eat. Eustice says the beef industry will continue to focus on beef-based convenience foods.

Despite a tepid reception when they first came on the scene nearly 10 years ago, pre-cooked beef products have been popularized by Schwan's, Hormel, No Name Steaks, General Mills, Lloyds and other Minnesota companies. "Now prepared products are an expanding section in the meat case," Eustice says

Eustice expects that soon the majority of beef products sold will be 'heat-and-eat' items, rather than cuts for home cooking.

Since concerns over BSE have curtailed access to some overseas markets, Eustice says it's key for Minnesota beef producers to reach U.S. consumers with high-quality products.

The new diet food

A proliferation of high-protein diets such as Atkins and South Beach over the past several years has increased demand for beef. However, Eustice says, "while high-protein diets will continue to play a role, balance and moderation combined with exercise is the key to a healthy lifestyle."

Food safety

An overriding concern for beef producers is the need to assure consumers they have access to a high-quality, safe food supply. Irradiation, which reduces pathogens, is among the technologies promoted by Eustice and the Beef Council.

AURI has worked with Minnesota processors to establish good sanitation practices and Hazard Analysis Critical Control Point plans to provide a higher level of assurance to consumers.

"Food safety drives demand," Eustice says. "That is a key ... to even enter the door. Ninety percent of consumers believe beef to be safe." ■

value-added pork processing will grow, Preisler says. "We will need that to stay competitive."

Preisler says a food-industry survey shows that nearly half of all Americans prefer partially-prepared dinner meals. About 12 percent want a fully-prepared meal. The pork industry is showing some growth in this area, as stores and delis are offering items such as whole racks of ribs cooked on rotisseries, ready to eat at home.

Food service

While most meals are still prepared at home, the trend is changing. More are eaten on the run or in restaurants. For that reason, the pork industry is aggressively promoting pork products to the food service industry.

Preisler says bacon, sausage and other pork products have long been staples on restaurant breakfast menus. Ham is popular on lunch menus, in sandwiches and salads. It's the dinner menu where pork industry leaders hope to grow beyond just loins and ham.

Coproducts

Markets for pork-processing coproducts, such as organ meats and hides, are generally well established, Preisler says. Most large-scale processors have enough volume to ship containers of coproducts overseas — but it's more difficult for smaller processors.

AURI is working with Minnesota's small and medium-sized animal processors to collectively market the offal from their facilities to add an additional revenue stream. Coproducts, such as rendered fats, could be used to produce biodiesel.

Preisler says the pork industry is interested in working with Minnesota's ethanol industry to research processes to incorporate more dry distiller's grains, an ethanol coproduct, in swine rations. Typically hogs can use rations with no more than a 10-percent blend of DDGs. But a process to alter the distiller's grains' make-up could increase their use in hog diets — benefiting both hog and corn producers. ■



PHOTO BY ROLF HAGBERG

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.

A little mustard on your pests?

Got crop pest problems? Spread a little mustard on them — the plant, not the condiment. Washington state ARS scientists are growing cultivated mustard and other Brassica-species stands as possible alternatives to using field chemicals on nematodes, weed seeds and other soilborne pests.



Researchers believe a chemical byproduct given off when the plant decomposes makes the soil toxic to nearby pests.

From: USDA ARS, October 12, 2004

A 'tuff' bed liner

Soybeans are helping truck owners protect their investments. Urethane Soy Systems of Illinois is marketing a spray-in truck bed liner containing soy-based plastics.

The Bio Tuff spray-in system uses SoyOyl™ polyols developed and produced at the South Dakota Soybean Processors facility in Volga, S.D. Bio Tuff has been tested and meets ASTM standards for truck-bed liners, plus it compares favorably with petrochemical-based liners in strength and durability tests. It is 20 percent soy-based.

From: Biobased Solutions, September 2004

Fishy olive oil

A Spanish nutrition company has launched an olive-oil-based product enriched with fish oil and antioxidants. Marketed as both a finished product and ingredient, the blend gives olive oil a nearly ideal blend of fatty acids.

The patented formula was based on evidence showing the health benefits of a traditional Mediterranean diet, which is typically high in plant foods and fish, with virgin olive oil as the primary fat source. The fish oil adds heart-healthy Omega-3 fatty acids and natural antioxidants which help to stabilize the oil. Mediterranean people enjoy some of the world's longest life expectancies and lowest mortality rates from heart disease.

From: Foodnavigator.com, October 22, 2004

Onions make cancer cry

Strong-flavored onions may not do much for your breath, but they may do wonders for your health. Researchers at Cornell University found certain strong varieties of onions, including Western Yellow, New York Bold and Northern Red were successful in inhibiting the growth of colon cancer cells. Milder-tasting onions showed relatively little cancer-fighting ability.

Onions are rich in a flavor compound called quercetin, a potent antioxidant found in apples, red berries and some vegetables, which has been linked to protection against cataracts, heart disease and cancer.

From: Journal of Agricultural and Food Chemistry, November 3, 2004

More bones about it

New research on monkeys suggests that a diet high in soy could be good for the hearts and bones of pre-menopausal women. Studies conducted at Wake Forest University Baptist Medical Center suggest natural estrogens in soybeans may be effective in improving cholesterol and bone density.



Research showed monkeys that were fed a soy-based diet had improved cholesterol levels compared to those fed a diet of milk and animal protein. Also, soy-fed monkeys increased bone mass more than those that didn't eat soy.

From: Soyatech.com, October 11, 2004

Hola, canola

Food makers looking to remove artery-clogging trans fats from their formulation will be able to use a new canola oil formulated from seeds with a low saturated-fat content. Developed by Dow AgroSciences, the Natreon canola oil is a naturally-stable alternative to hydrogenated oil, a process that raises trans fatty acid levels. Research has shown trans fats raise bad cholesterol.

From: Foodnavigator.com, October 22, 2004

Lady Liberty loves soy

Tourists visiting New York's Statue of Liberty will be riding high on soy oil. The National Park Service has begun using soybean-oil-based hydraulic fluid to operate elevators in the 151-foot tall landmark. The lifts had used petroleum oil, but ARS scientists were asked to develop a biodegradable, nonpolluting, economical alternative from a renewable resource — meeting industrial safety and performance standards. Tests show the soy-based hydraulic fluid works as well or better than the mineral-oil products in lubricity, biodegradability and reduced flammability.

From: USDA ARS, October 19, 2004

New drink targets malnutrition

A new, highly-fortified, meal-supplement beverage is being lauded as a tool for improving nutrition among at-risk children and adults in developing countries. The Nutri Sip brand drink, launched in South Africa, has been shown to significantly improve the health of school children in a 12-school study.

Loaded with pre-cooked maize, soy isolates and dairy ingredients, the drink was formulated to address nutritional deficiencies in target populations. Research in South Africa showed precisely-formulated, functional foods delivered real health benefits to children and provided a better value for money that governments and other aid donors invest in school-nutrition programs.

From: Soyatech, November 1, 2004

No foolin'

PHOTOS BY ROLF HAGBERG

An innovation conceived April 1 offers serious help to hog farmers

Darryl Metcalfe, at left, and Tony Schmitt have patented a corn-stalk mat for hog nurseries and farrowing crates that they manufacture at Mat Inc., owned by Joe Karpik, on right.

BY DAN LEMKE

St. Cloud, Minn. — Entrepreneurs Darryl Metcalfe and Tony Schmitt are launching an innovative product that could make life easier for hog farmers — even though the idea started with a little foolishness.

“We got together on April Fools Day,” chuckles Metcalfe, recalling the partners’ first business meeting.

But the two wisely formed USA Solutions, makers of Bio Mat, a patented corn-stalk mat made for hog nurseries and farrowing crates. The biodegradable mats are an alternative to rubber mats — currently the industry standard — that have to be disinfected between uses.

The single-use mats have a 7 to 10 day life span and are available in 30”x 4’ farrowing mats and 4’ x 4’ nursery mats.

The cursed rubber ritual

Metcalfe, who has 25 years experience in the hog industry as a herdsman and swine manager, used to curse rubber mats that have to be dragged out and disinfected each time a new batch of hogs is brought to the nursery or new sows are moved into farrowing barns.

“Most guys I know hate the rubber mats because they’re heavy, hard to handle and hard to clean, but they’re the industry standard,” Metcalfe says. “I just thought there had to be a better way.”

Metcalfe says rubber mats can also promote health problems such as scours because washing and disinfecting doesn’t clean off all the bacteria. So he conceived a disposable, biodegradable mat that does not require cleaning, is user friendly, promotes animal comfort and cuts bacteria.

The 80th phone call

On April 1, 2004 Metcalfe met with acquaintance Tony Schmitt, who had already built and sold his own bulk-oil container business and had experience with patents. The two decided the bio-mat idea was worth pursuing.

Then the dialing marathon began.

“I made phone calls from one end of the country to the other looking for someone who could help us,” Schmitt says. “After about 78 calls, I didn’t think it would happen. The 79th call went to Alan Doering (AURI technical services specialist). He directed us to Mat, Inc., who got the 80th call — and here we are.”

Doering, who works extensively with biomass and coproducts, knew the biodegradable hog-mat concept sounded promising. He had worked with Mat, Inc. on other value-added projects, including wool mulch and landscape mats, so he suggested Schmitt connect with the Floodwood, Minn. company. (See accompanying article, next page)

“We were afraid we’d be doing business in California or somewhere else a long ways away,” Schmitt says. “We’re fortunate to find it all right here.”

Schmitt and Metcalfe made and tested several mats at Mat, Inc. before finding the right process and product mixture for both nursery and farrowing mats. The mats have been through several barn trials and testing and are now ready for commercialization.

Hog pleasing

“There’s a great opportunity here,” Doering says. “The mat is something the hog industry will use, plus it’s made from an abundant, renewable resource that is of relatively low value.”

USA Solutions has worked with animal health professionals to evaluate Bio Mat and assess the market

size. Because of market demand, Schmitt and Metcalfe project they will market one million mats their first year. The mat is available only through the USA Solutions warehouse in St. Cloud, Minn., but distributors may be added to help market the products.

Hog producers will be interested, Doering predicts. "It's an improvement over what they're currently using."

"We wouldn't have come this far if we didn't believe in it so much," Metcalfe says. "It would have been easy to quit. But now we have a product that is made exclusively from ag fibers, that's grown and made right here in Minnesota." ■

The mat is available by contacting USA Solutions at (320) 250-7687.



PHOTO BY ROLF HAGBERG

Unlike rubber mats that have to be disinfected between uses, the single-use Bio Mat can be composted.

Jewel in Floodwood

Small town manufacturer makes fiber landscaping products for world market

BY DAN LEMKE

Floodwood, Minn. — About 45 miles west of Duluth on Highway 2 lies the hamlet of Floodwood, home to an innovative manufacturing facility that has been making plant-fiber products — from molded auto parts to erosion control products — for over half a century.

The plant was originally opened by Superwood Corporation in the 1950s to mold resins and wood fibers into armrests, door panels and dashboards for the auto industry. When it closed in 1984, long-time employee Joe Karpik and several partners bought the plant and started Mat, Inc.

The company produces erosion-control products such as landscape mats and hydroseeding mulch. Most products are wood-based, but some contain paper or ag fibers.

Mulch sold under the Soil Guard label is blended with water and sprayed on the ground to form a water-resistant, plant-friendly ground cover. It is used on erodable lands, primarily around road and other construction sites. The rolled or baled mats are also used on erodable land but for smaller applications.

Mat, Inc.'s latest foray is into the livestock industry; it recently started manufacturing Bio Mats for hog farrowing crates (see accompany story, No Foolin') developed by USA Solutions.

Most products are shipped within a 1,000-mile radius because it is not cost effective to ship them farther. However, some premium products, such as Mat Blend Plus fiber bales, are exported to 20 countries.

A boon for the local economy, Mat, Inc. employs 30 people in Floodwood and offers markets for low-value wood, paper and ag fibers.

Karpik has expanded Mat, Inc. over the past several years and purchased plants in Iowa and North Carolina. He also works with a Washington state manufacturer to make products for West Coast markets.

Alan Doering, who runs AURI's coproducts plant in Waseca, says he has often tapped Karpik's knowledge of manufacturing, biomass and mats when evaluating ag-based products.

"With Mat, Inc.'s equipment and willingness to try new things, they have been a big help in developing and testing (products)," Doering says.

For example, the company has produced several mats that are being tested in strawberry plots at the University of Minnesota-Morris. (see Oct-Dec 2004 issue of Ag Innovation News).

Research and development are important to Mat, Inc.'s future, Karpik says. "We're always looking for new products that fit what we do." ■

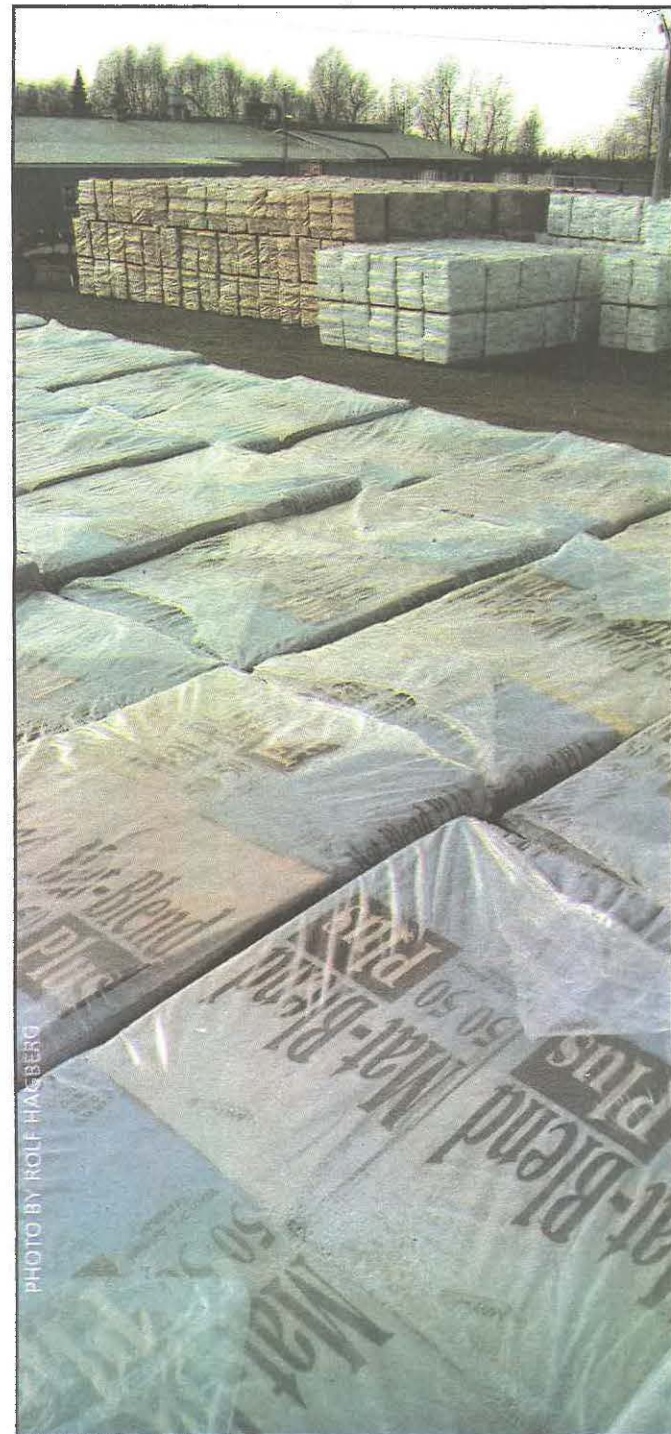


PHOTO BY ROLF HAGBERG

Erosion-control landscape products, such as Mat-Blend Plus bales made from wood and ag fibers, are manufactured by Mat Inc. in Floodwood, Minn.

On cover: Joe Karpik operates the Mat, Inc., Floodwood facility, which once made auto parts from wood fibers and resins.

AURI ENERGY CENTER

news

STORIES AND PHOTOS BY DAN LEMKE

Energy Center associate director hired

A veteran of Minnesota's agriculture industry has joined AURI to help further opportunities for ag-based, renewable energy. Thomas Melin was named associate director of AURI's Center for Producer-Owned Energy on November 15.



Melin

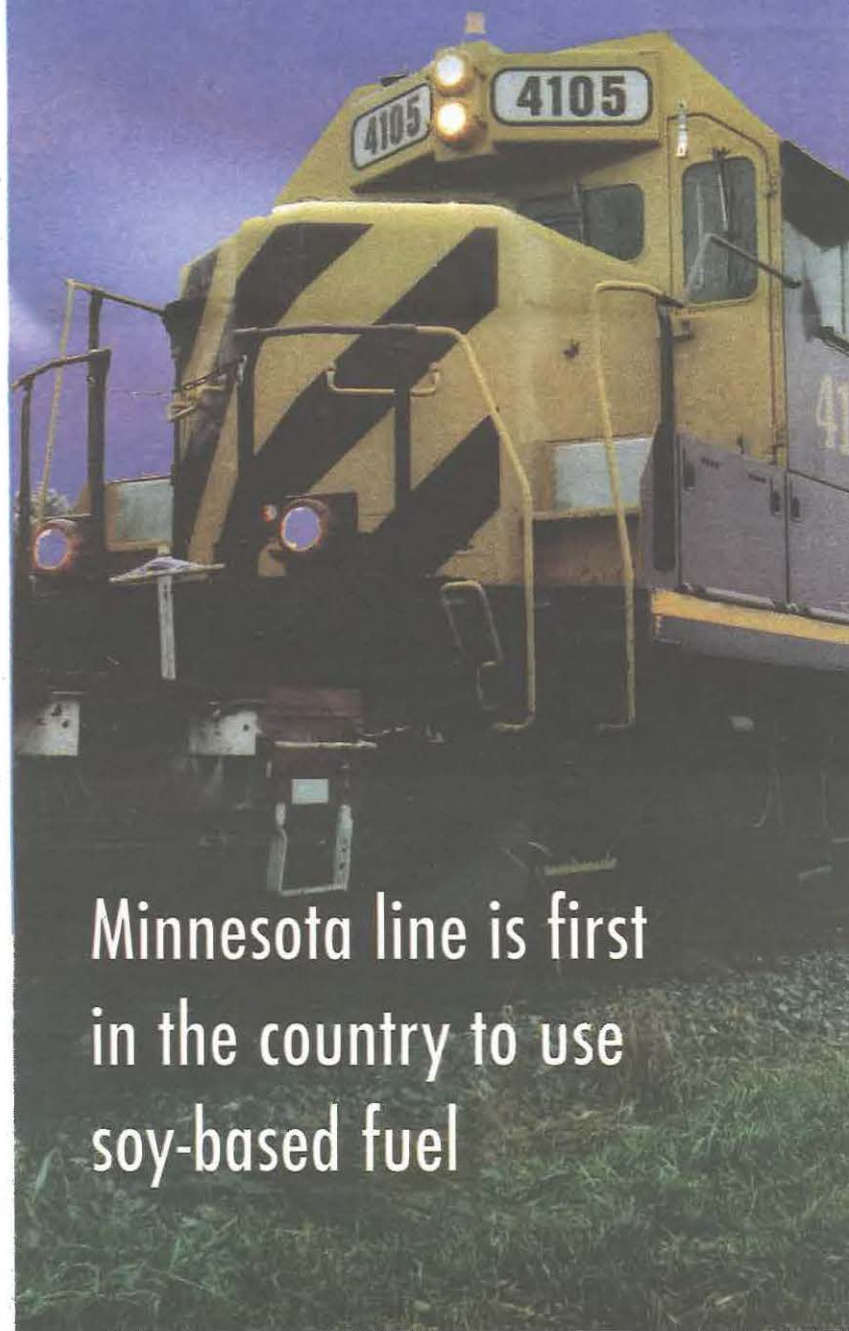
"Tom has been in agriculture most of his life and brings a broad network and strong base of accomplishments," says Max Norris, the Energy Center's director and AURI director of projects and technology. An independently-governed entity affiliated with AURI, the Energy Center was created by a grant from the U.S. Department of Agriculture to support producer-owned energy initiatives.

Melin served as regional extension educator in the Red River Valley for more than 28 years before he retired from the Minnesota Extension Service in 2003. He holds a master's degree in agricultural education from North Dakota State University. Melin lives in Ada, Minn. and is based at AURI's headquarters in Crookston.

"Given the times we're in, with the high cost of fuel, we need to be proactive in supporting opportunities that can benefit producers," Melin says.

"Renewable energy is on the forefront and research is going to play a key role in developing those opportunities." ■

All aboard for biodiesel



Minnesota line is first in the country to use soy-based fuel

Redwood Falls, Minn. — A familiar whistle and earth-shaking rumble echoes through the Minnesota River Valley. But there is something decidedly different about the locomotive tugging rail cars down the Minnesota Prairie Line. It is powered with biodiesel.

In October, the Minnesota Prairie Line Railroad became the first in the country to power its locomotives with biodiesel. "We're proud to lead the way and help out Minnesota farmers," says Mark Wegner, president of the line.

The 94-mile short-line railroad runs through five southern Minnesota counties, from Hanley Falls to Norwood. It primarily hauls agricultural products, but also carries cannery products, lumber and other supplies needed by businesses along the line.

Minnesota lawmakers established a mandate in 2002 that requires every gallon of diesel sold in Minnesota by June 2005 contain at least a 2-percent biodiesel blend. Ironically, railroads were excluded.

"Even though railways aren't included in the biodiesel mandate, this line recognizes its value as a cleaner-burning, renewable fuel," says Max Norris, AURI director of projects and technology, who has been researching and testing biodiesel feedstocks and blends for more than 15 years.

Biodiesel is an alternative to petroleum-based diesel fuel that can be made from soybean or other vegetable oils, animal fats and waste greases. Its benefits include increased lubricity and reduced emissions.

"The railroad industry has been reluctant to embrace biodiesel," Wegner says. Several major locomotive manufacturers have been unwilling to cover biodiesel in warranties. The Minnesota Prairie Line uses locomotives powered by Caterpillar engines, which have been used in numerous biodiesel application tests.

"If we're going to get biodiesel going, it's important that the rail and trucking industry recognize its value," says Minnesota U.S. Senator Mark Dayton.

The National Biodiesel Board reports that U.S. railroads consume more than 3 billion gallons of diesel fuel annually, about the same amount as agriculture. At a 2-percent blend, the railway industry could consume 60 million gallons of biodiesel annually.

The Minnesota Prairie Line uses about 500,000 gallons of diesel each year and is initially using a 2-percent biodiesel blend. However, Wegner says the line hopes to move soon to a 5-percent blend.

The Minnesota Prairie Line could purchase biodiesel locally from the Farmers Union Marketing and Processing Association, which has opened a refinery at its Central Bi-Products rendering facility in North Redwood Falls. (See sidebar) The facility's annual production capacity is 2.8 million gallons.

"This is incredibly good news," says Bob Worth, Lake Benton, Minn. farmer and vice president of the Minnesota Soybean Growers Association. "As the use of biodiesel spreads to different sectors, everyone stands to gain." ■

MINNESOTA PROCESSOR ENTERS BIODIESEL ARENA

Nothing could be re-finer

North Redwood Falls, Minn. — Already known for its strong ethanol industry, Minnesota can now boast its first biodiesel refinery.

In November, FUMPA Biofuels, a division of Farmers Union Marketing and Processing Association, began operating its biodiesel refinery at its Central Bi-Products rendering facility in North Redwood Falls. The plant will produce 2.8 million gallons of fuel annually, using soybean oil as the main feedstock. Eventually FUMPA Biofuels intends to use other raw materials such as greases and animal fats from its rendering operation.

"Biodiesel has been used in Europe for 40 years — now the U.S. is coming to the table," says Chuck Neece, FUMPA Biofuels director of research and development.

"We feel strongly about the benefits of biodiesel including its lubricity, the fact it's a renewable fuel and it's clean burning."

The plant will meet about one-third of the capacity required to implement a biodiesel mandate passed by the Minnesota Legislature in 2002. The state needs at least 8 million gallons of biodiesel production by June 2005 for the 2 percent per-gallon mandate to take effect.

"They've been working on this for at least three years, so it's great to see it coming to fruition," says Rose Patzer, AURI chemist. Patzer began working with FUMPA in 2001 and examined using yellow greases as fuel for FUMPA's vehicle fleet.

FUMPA President and CEO Don Davis says the cooperative's "primary goal is to help farmers, livestock producers and ranchers add value to their products."

Beside its biofuels division, FUMPA operates Midwest Grease, which collects restaurant greases, Northland Choice, a pet food and feed ingredient manufacturer, and Central Bi-Products, which processes and markets animal and poultry coproducts. FUMPA also is part owner of Pet Care Systems, the Detroit Lakes producer of Swheat Scoop wheat-based animal litter. ■

BURN POWER from page 12

material burned. Most energy sources are evaluated by cost per million Btu. "We also have to factor in efficiency," Patzer says. "Some biomass materials burn more to completion. And like home furnaces, some stoves are designed for materials that burn more efficiently."

Natural gas is about 90-percent efficient, while renewable fuels are generally 70-percent efficient. Still, plugging these efficiencies into cost calculations, natural gas is \$15.63 per million Btu and propane is \$17.90. Shell corn, calculated at \$2.10 per bushel, costs only \$7.74 per million Btu, even at 70-percent burn efficiency.

Other important factors include moisture, which "assists mold growth, especially in fibrous materials," Patzer says. "If a sample has high-moisture content, it will most likely not have a long shelf life." Also, water adds weight and mass, but since it vaporizes rather than burns, it "negatively affects the energy content," Patzer says. High-moisture biomaterials have to be dried and often pelleted, which increases cost.

Another consideration is ash — the residual that remains after burning. "Generally, a sample with high levels of residual ash will not be a good candidate for combustible fuels by itself because of disposal and handling issues," Patzer says. "An exception is when the ash is high in minerals such as potassium or phosphorus ... that has a potential use in fertilizers." A high-fat content can be

advantageous because fats generally burn completely, without leaving material behind.

The only factor AURI doesn't test in its Marshall lab is sulfur emissions. "If all other results are good, we will pay for outside testing," Patzer says.

Nuts and grass meet first tests

Results of the hazelnuts combustion study show it yields approximately 9,000 Btu per pound, which is higher than corn at almost 7,000 Btu per pound and aspen at about 7,500. "The ash content was low — about 1.5 percent by weight, and the fat averages about 15 percent" — a good result, Patzer says. "Moisture is about 9 percent, which is normal for biomass material. Corn is about 13 percent moisture, and wheat around 10 to 12 percent."

Grass fiber varied by variety but in general was about 7,000 Btu per pound. "Moisture averaged 6 to 7 percent, ash varied from 4 to 10 percent, and fat is too negligible to test." However, the average cost per million Btu, which AURI has calculated for other biomaterials, couldn't be assessed for grasses or hazelnuts "because we don't have enough information about their industrial market values — they are new markets," Patzer says.

An issue with both alternative crops is "we need to have a steady source of materials. If it's a rare material, we might

Btu comparison of fossil and biomass fuels

Product	Avg. Btu per unit	Cost/unit	Efficiency	Cost per million Btu
Electricity	3,413 per kWh	\$0.0620	97%	\$18.73
Natural gas	1,028,000 per 1,000 cu.ft.	\$13.7000	85%	\$15.63
#2 fuel oil	140,000 per gallon	\$1.8000	80%	\$16.07
Propane	91,333 per gallon	\$1.3900	85%	\$17.90
Aspen	7,589 per pound	\$0.0450	70%	\$8.47
Corn - shell	6,924 per pound	\$0.0375	70%	\$7.74
Straw	7,153 per pound	\$0.0400	70%	\$7.99
Soybean hulls	6,777 per pound	\$0.0375	70%	\$7.90

Fossil fuel numbers are published by the U.S. Department of Energy. Biomass numbers are from tests conducted by the AURI oils lab in Marshall, Minn; the Minnesota Valley Testing Lab in Bismark, N.D. and the Twin Ports Testing lab in Superior, Wisc. Along with solid fuel proximate analysis done in accordance with the American Society for Testing and Materials, the biomass fuel costs factor in transportation and raw material processing, such as grinding, milling and pelleting. Analysis is done on a case-by-case basis as agricultural products vary by season, plant variety and geographical region. These factors can affect combustion performance.

be able to blend it with one that is more abundant," Patzer says.

Price prevails

"The bottom line is biobased products as fuels can't be successful unless they can compete in the market." Availability, performance standards and cost will determine competitiveness, Patzer says.

Over the past 20 years, she says. "when the price of fuel is high, there is a regenerated interest in renewables. When fuel prices level off, interest tapers off."

"The state of the economy is a driving force for renewable fuels." ■

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BY CINDY GREEN

An oil field may be growing in our own backyards. Not just the corn that is turned to ethanol or soybeans to biodiesel, but the Kentucky bluegrass, peat, alfalfa — even hazelnuts.

Rose Patzer, an AURI chemist in Marshall, has been evaluating various feedstocks that have potential to be burned as combustible fuels. The studies are often requested by farmers or grower groups who want to capitalize on the increased interest in renewable fuels.

"Since 9-11, we have seen natural gas prices rising and home heating costs going up," Patzer says. With concerns about Iraq and homeland security, renewable fuels interest has "definitely grown. ... We saw Congress waning before, now it's important."

"Right here in Minnesota, we have a lot of firsts in the renewable fuels area — as we saw in the biodiesel legislation passed." For a chemist working on biofuels, "it's really helpful to be in this state."

Stoking the fire

Since Patzer was hired in 1996, her AURI work has primarily been on biodiesel. However, in the past several years, she has tested a range of feedstocks that could be burned in home or industrial furnaces, such as corn, straw, soybean hulls and aspen.

This fall, Patzer conducted tests for growers of two rather uncommon feedstocks: hazelnuts and grasses.

Badgersett Research Corporation of Canton, Minn. had already received some AURI assistance for developing hazelnut hybrids and inquired about the energy potential of spoiled nuts that cannot be marketed as food. Hazelnuts' high-oil content made it a good candidate for combustion, Patzer said. The other advantage is "the hard shell will protect it from spoilage longer than other bio materials."

About the same time, RL Growers, a Roseau and Lake of the Woods area cooperative, asked AURI to assess the energy value of various grass fibers — Kentucky bluegrass, alfalfa stems, red canary straw grass, red-top straw, rye-grass straw, timothy-grass straw and peat — to potentially build markets for the foliage.

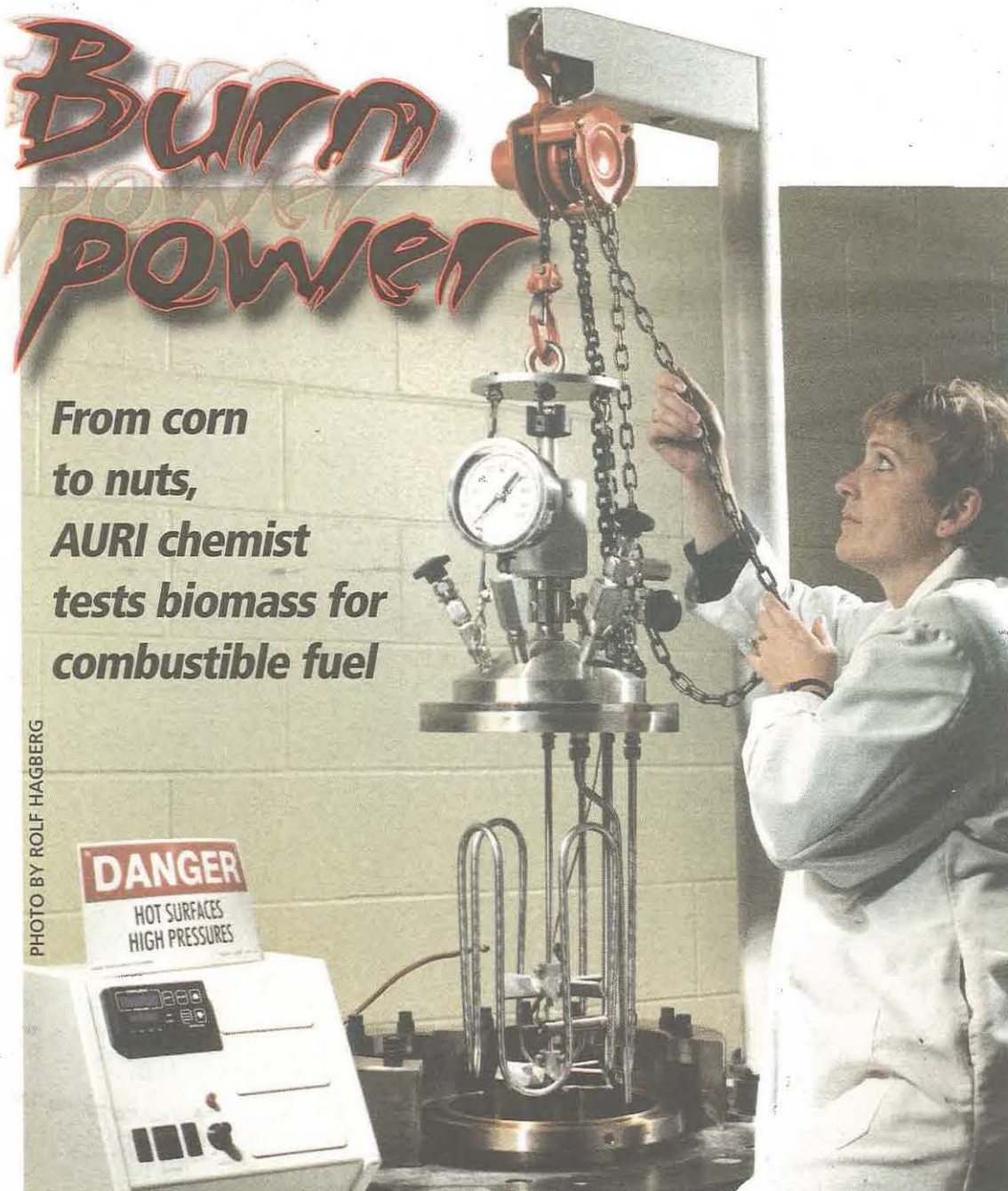
Both the hazelnut and grass evaluations were completed in November with good results. However, more cost studies need to be done, factoring in the raw material's market value and storage and handling costs. To get better density for the next test, grasses will be dried and pelleted by Al Doering in AURI's Waseca coproducts plant.

Energy factors

When AURI tests any biomass for its energy value, researchers evaluate five factors: Btu content, burn efficiency, moisture, ash and fat content. Samples are sent through a grinder to generate a homogeneous mixture before they are burned in a test furnace.

The most important consideration is Btu or British Thermal Units per pound of

BURN POWER to page 11



AURI chemist Rose Patzer assembles a 5-gallon, high-pressure, high-temperature reactor used in a biodiesel production process that AURI patented in June 1996.

BI DIESEL



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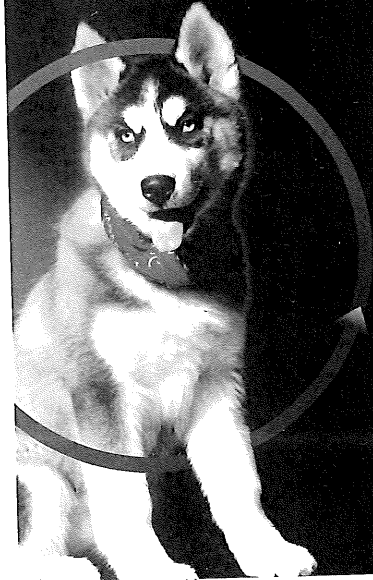


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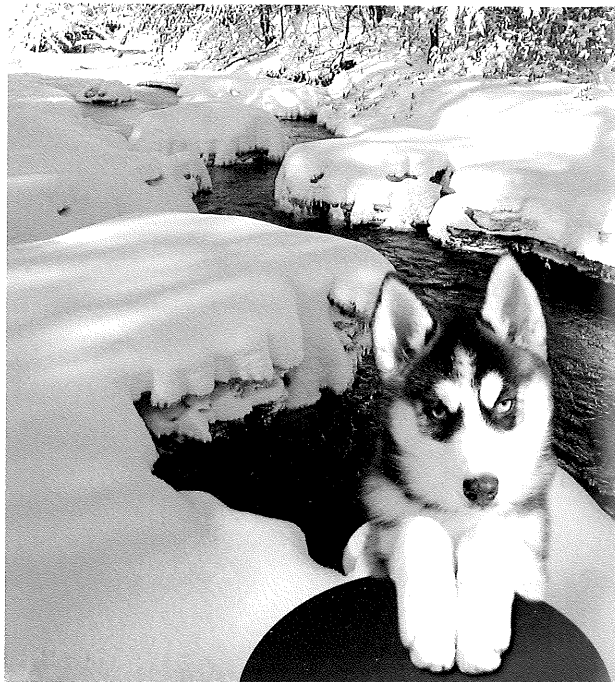
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Tested to meet or exceed the standards set by the Environmental Protection Agency (EPA) for environmental improvement

Product tested to American Society of Testing Methods Standards - ASTM meets or exceeds the quality parameters.

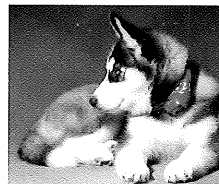
BI



DIESEL

P.O. Box319
590 West Park Road
Redwood Falls, MN 56283

For more BioDiesel information look me up on my website:
www.BIOpup.com

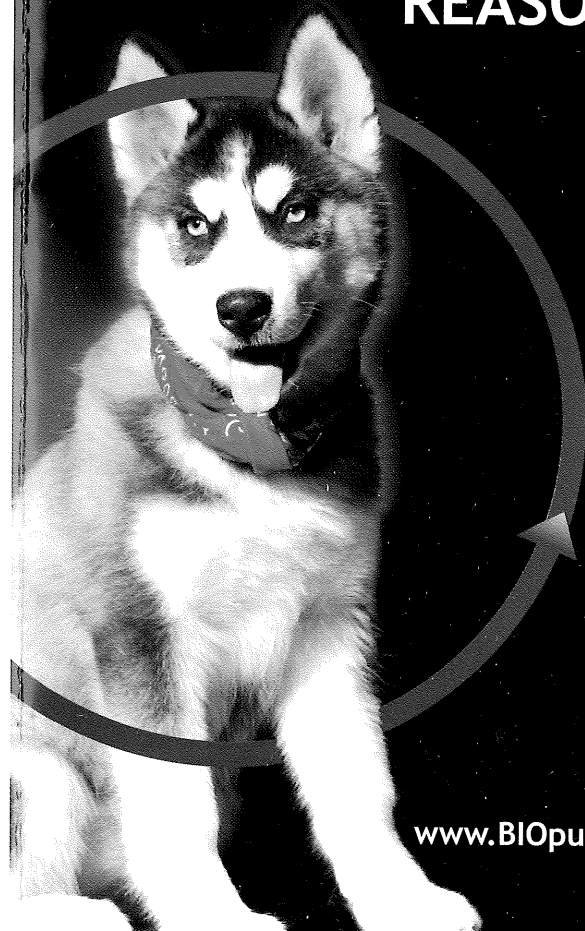


BI

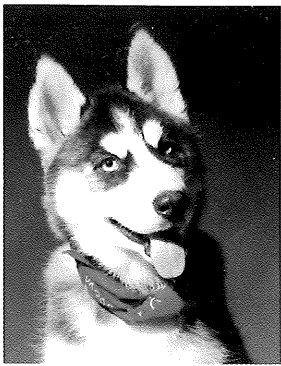


DIESEL

Renewable **ENERGY**
For All The
RIGHT
REASONS



www.BIOpup.com



HARNESSING RENEWABLE ENERGY RESOURCES

"Hi," my name is BIOpup and I'm

leading the **Northland Choice BioDiesel** team. We are all pulling for a cleaner and safer world. As the lead pup I would like to share some information with you about the viability of BioDiesel.

Did you know that:

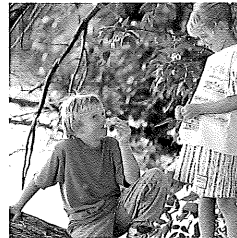


• BioDiesel is made from animal oils and plant oilseeds. These are all renewable in a relatively short period of time compared to finite fossil fuels.



• BioDiesel is biodegradable and non-toxic. It reduces emissions, has a pleasant odor and its handling safety all make BioDiesel well-suited for many areas such as:

- National Parks & Forests
- Marine Vessels
- Truckers
- Metro & School Transit



• BioDiesel is a stable fuel that performs reliably in all diesel engines. It's exhaust is free of lead, sulfur dioxide, halogens, and has reduced particulates, unburned hydrocarbons, carbon monoxide, and carbon dioxide.



DIESEL

• BioDiesel is very friendly to the environment! The same amount of carbon dioxide produced by burning BioDiesel will be absorbed by plants used in feed for animals or oil seed production. This reduces the impact to global warming.

We are all in this together and now is the time to get in the harness and team up for a better tomorrow.

Northland Choice

BioDiesel is a resource to take immediate and proactive measures to improve our air quality while reducing our dependence on foreign oil. Tell em' BIOpup sent you.



Agricultural Utilization Research Institute

Senate Environment, Agriculture and
Economic Development Budget Division

January 27, 2005



AURI Mission

- Identification and expansion of markets for new or existing commodities, ingredients and products;
- The development of new uses or value improvements for Minnesota agricultural commodities;
- The development of more efficient resource saving practices



AURI History

- AURI was established in 1987; created as a 501 (c)3 nonprofit
- Created and supported by the legislature
- Established to be non-governmental catalyst for value-added activity in rural Minnesota



AURI Board of Directors

- Producer driven; representative of Minnesota agriculture leadership
 - Cooperatives
 - Agri-business
 - Commodity groups
 - Farm organizations
 - Legislature



AURI: What we do

Sole focus is adding value to MN agriculture

- Technical assistance
 - R&D for MN agriculture and rural processors
 - Technical feasibility
 - Analytical testing of processes/products
- Broad impact initiatives
 - Identify emerging opportunities with potential to impact large number of producers



AURI: What we do

- Provide R&D expertise to rural Minnesota
 - Access to experienced technical staff
 - On site or at AURI laboratory facilities
 - Conduit to additional networks and resources
- Provide producer information and education
 - Training sessions
 - Forums
 - Informational materials
 - Ag Innovation News



AURI Facilities

- Meat Lab, Marshall
- Fats & Oils Lab, Marshall
- Co-products Lab, Waseca
- Product Development Kitchen, Crookston



AURI Strengths

- Only value-added program of its kind in the country
- AURI provides on-going technical and feasibility assistance
- AURI project staff work closely with clients to assess needs and adjust to opportunities
- Unique services do not duplicate efforts of MDA, U of M or other public groups



AURI Strengths

- Lab and pilot plant facilities located in outstate Minnesota
- Many staff hold advanced degrees with years of industry experience offer assistance on site or in AURI labs
- Recognizes and develops emerging opportunities to give MN agriculture a marketing advantage



AURI Inquiries



AURI clients

- Farmers and farmer-owned cooperatives
- Small & medium-sized agri-processors
- Emerging rural businesses



AURI partners

- Commodity and grower groups
- Private and public organizations
- State and federal agencies



AURI Assistance

- 15,000 hours service to projects in FY '04
- 245 projects received assistance in FY '04



Customer Feedback

- Annual survey of current clients
- Conducted by independent university research firm
- Impact of AURI from clients from all areas of Minnesota
- Based on information from 49 respondents

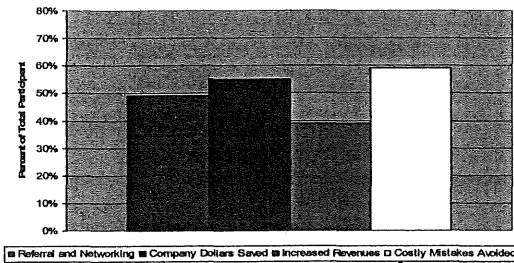


AURI Results

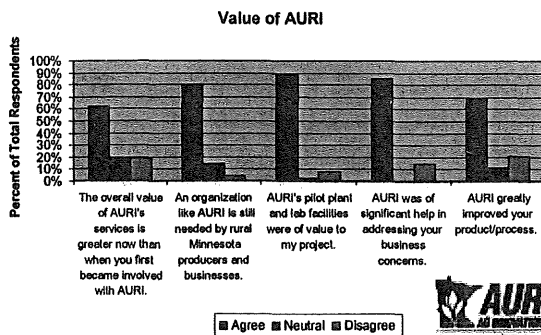
- 197 new jobs created by AURI supported projects in last year
- Expected investment of more than \$16 million resulting from those projects
- Nearly 5,000 producers directly impacted by projects in past year



Benefits Achieved



Client Feedback



AURI Programs

- Develop innovative commodity-based products
- Process development assistance
- Assist in promoting products developed by AURI
- Identify emerging opportunities
- Assist in bringing product or process to marketplace



2004 Project Highlights

- FUMPA Biodiesel
- FSMIP
- Biorefining
- Mississippi Topsoils expansion
- USA Solutions



Reinventing AURI

- State support cut by nearly 60% in 2003
- Closed 2 offices—St. Paul and Morris
- Staff reductions—from 27 FT to 14 FT, 3 PT
- Focus efforts on areas of greatest impact
- Priorities:
 - Energy and Co-products
 - Commodity Utilization
 - Meat Processing and Product Development



Reinventing AURI

- Establishment of Center for Producer-Owned Energy
- Competitive grant funded by USDA
- Provides assistance to producer-driven, ag-based renewable energy projects in Minnesota



Outside and awarded funds

- \$1 million grant from USDA for Ag Innovation Center
- Xcel Energy grant
- Collaborative agreements with commodity groups
- \$2.1 million outside funds awarded in FY '04
- Many grants only available with continued base funding



AURI: A Resource for MN

- Market and industry focused
- Producer oriented
- Innovative, adaptable
- Sets the standard across U.S. for value-added development



Agricultural Utilization Research Institute

Adding Value to Minnesota Agriculture



**Agricultural Utilization Research Institute
Project Technical Assistance
Fiscal Year 2004**

<u>Project Number</u>	<u>Team Leader</u>	<u>Project Title</u>	<u>Hours Expended</u>
2000001T	MSPARBY	Produce wine for tourist area	11.00
2000023T	CWADHAWA	MULTI-Bakery Products	16.00
2000044T	LGJERSVI	MULTI-Product Line Expansion	0.50
2000053T	EWENE	FPEAS-Crookston Bean	4.00
2000055T	JCRAWFOR	COPROD-Value Added Manure	171.00
2000062T	MSPARBY	BRLY-Barley Beta Glucan Consum	19.50
2001003T	MSPARBY	LAMB-Country Meadow Farms	13.00
2001005T	MSPARBY	CORN-Distiller Grain Protein	4.00
2001007T	ADOERING	MULTI-Specialty Bird Feed Prod	56.50
2001017T	MNORRIS	COPROD-Value-Added Processng	18.00
2001018T	DTIMMERM	BEEF - Hancock Quality Meats	0.70
2001031T	ADOERING	MULTI-Analysis of Cull Beans	2.50
2001032T	CWADHAWA	MULTI - Soup Line Expansion	0.65
2001034T	CWADHAWA	FIBR-Expansion of High-Protein	0.15
2001045T	ADOERING	CORN-Corn Cob Pelleted Fuels	16.50
2001046T	CWADHAWA	MULTI-Bakery Mix Business	10.15
2001059T	DTIMMERM	MULTI-Minnesota Enhanced Beef	22.10
2001060T	MNORRIS	DUCK-Frnch Spec Foods Mkt Dev	0.60
2001063T	ADOERING	COPROD-Renewable Ag Biomass fr	8.50
2001065T	DTIMMERM	BEEF-Kim Vig Inc. Market	18.50
2001067T	JCRAWFOR	SOYB-Soybean Product Expansion	8.50
2001070T	MSPARBY	COLLAB-Economic Impact	0.50
2001071T	MSPARBY	COPROD-Poultry Bedding	18.00
2001073T	ADOERING	Making Biomass Energy A	94.00
2001074T	CWADHAWA	MULTI-Food Advantage, Inc.	0.15
2001084T	DTIMMERM	COLLAB-Berkshire Marketing	57.50
2001092T	ADOERING	COPROD-Ag.Co-Prod./Renew Fuel	2.50
2001093T	KSANNES	MULTI-Utilization of Fibrous A	8.00
2001094T	MNORRIS	PORK-Pastures Pork	2.00
2001095T	DTIMMERM	ELK-MN Elk Meat Market	8.00
2001098T	DBARTHOL	MULTI-Countertop Tumbler	1.00
2002003T	LGJERSVI	DAIRY-Cedar Summit Dairy, LLC	28.50
2002008T	MSPARBY	SOYB-Marketing of Soy Drinks	3.50
2002011T	CWADHAWA	MULTI-Oat Cakes Manufacturing	0.15
2002018T	ADOERING	ALF-Alfalfa Feed Additive	13.50
2002020T	ADOERING	FIBR-Fiber Lanscape Mats	0.75
2002021T	DBARTHOL	BEEF - Pioneer Snacks, Inc.	12.25
2002023T	CWADHAWA	TMATO-Sauces and Rubs	0.15
2002025T	ADOERING	FIBR-Agri Mulch	4.00
2002027T	DTIMMERM	PORK-Hmong Processing Center	2.00
2002028T	MSPARBY	COPROD-Methane Digester Feas	12.75
2002029T	ADOERING	CORN-New Forms of Feed & Marke	0.75
2002037T	ADOERING	SUGAR BEETS-Value Added Feeds	5.00
2002039T	DTIMMERM	CORN-French's Specialty Corn	63.00
2002040T	BREUTER	BEEF-R&P Gourmet Beef	374.50
2002041T	DBARTHOL	SOYB-Soy-based Meat Analogue P	0.70
2002049T	ADOERING	AG RESIDUES-Characterizing Ag.	68.00
2002051T	ADOERING	U of M - New Feed Alternatives	33.00
2002055T	CWADHAWA	MULIT-Specialty Bread	0.15
2002061T	DTIMMERM	BEEF- MN Enhanced Beef-Phase 2	17.25
2002063T	DTIMMERM	South West Min. Natural Beef	24.00
2002069T	ADOERING	Bio-Energy Institute of Standa	9.00
2002070T	RPATZER	COLLAB-Animal Fats/Rendered Gr	65.00
2002072T	MSPARBY	COPROD-Value Addition of Corn	12.00
2002076T	ADOERING	Fact Sheet - Corn Burners and	23.50
2002078T	CWADHAWA	WHT-Product Dev. for line exte	2.15

2002081T	CWADHAWA	WHT-Reformulation and Commerci	2.15
2002084T	ADOERING	Value added Utilization of DDG	26.00
2002086T	CWADHAWA	Evaluation of Soybean Varietie	15.50
2002087T	CWADHAWA	Opp. for Funct. Foods in Cerea	8.15
2002090T	DTIMMERM	Small Species Processing Plant	36.00
2002091T	ADOERING	Utilization of DDGs	17.00
2002093T	MSPARBY	Small Food Processors Training	3.00
2002094T	CWADHAWA	Value Added Ag Challenge	4.50
2002103T	ADOERING	SOYB-Knewton Seed Co	315.00
2002106T	DTIMMERM	COPROD-Animal Co-Products Util	2.00
2002108T	MNORRIS	BEANS-DD Value Added IP	48.50
2003001T	DTIMMERM	MULTI-Horse Feed Product	4.00
2003002T	CWADHAWA	BUKWT-Dev. & Marketing of Prod	52.65
2003005T	DTIMMERM	POULT-Natural & Organic Poultr	195.00
2003009T	CWADHAWA	OATS,WHT-Hot Cereal & Soup Mix	0.15
2003010T	CWADHAWA	SUGR,WHT,DAIRY-Gourmet Health	2.15
2003011T	TSISSON	CORN-Corn Meal Fish Coating	1.00
2003013T	DBARTHOL	PORK-Dombrovski Meats-Cured	3.20
2003014T	MNORRIS	LAMB-help launch reduced fat	2.70
2003015T	CWADHAWA	BISN-Buffalo Pass Ranch VA Pro	1.75
2003016T	MSPARBY	WHT,BRLY-Grain straw/home cons	2.00
2003017T	DTIMMERM	BEEF-MN Beef Ind. VA Products	7.00
2003018T	CWADHAWA	FLAX-Product development Marke	13.40
2003021T	CWADHAWA	OATS-Commercialize Oat Cookies	7.40
2003023T	ADOERING	DAIRY-Willmar Digester/Energy	4.50
2003028T	CWADHAWA	Nutritional Labeling-Brochures	88.78
2003030T	BREUTER	EDUCATION-Sm. Scale Animal Pro	15.55
2003031T	DBARTHOL	HACCP-Food Safety Inform Piece	23.05
2003033T	MNORRIS	PORK-P G Reduced Fat Bratwurst	11.50
2003036T	DTIMMERM	MULTI-Lamb shop Gyros, Lunch M	4.50
2003038T	LGJERSVI	Direct Marketing Brochure	1.50
2003039T	ADOERING	HAY-Kandi Hay Development	10.00
2003040T	ADOERING	WHT - Improved Cat Litter	28.00
2003042T	MNORRIS	MULTI-Eval. oils as Fuels/Turb	25.75
2003044T	CWADHAWA	MULTI-Certified Organic Entree	55.28
2003047T	LGJERSVI	MULTI-Info Services FY2003	0.50
2003048T	CWADHAWA	MULTI-Dairy & Beans	4.15
2003050T	MSPARBY	COLLAB-Renewable Energy Model	7.50
2003051T	CWADHAWA	RICEW-Anal/Nutrit. Label/Wild	0.15
2003052T	DTIMMERM	PORK-Health Ben/Extruded Soybe	235.00
2003053T	CWADHAWA	CORN,POULTC,PORK-Tamales	0.40
2003055T	DBARTHOL	MULTI-Beef, Pork, & Poultry	7.50
2003056T	CWADHAWA	FLAX-Market Assess/Whole/Groun	0.15
2003057T	ADOERING	COPROD-Ag Biomass Fuel Evaluat	9.00
2003059T	ADOERING	COPROD-Certified Milk Replacer	0.75
2003060T	DTIMMERM	FED-FSMIP Grant Time	1.50
2003062T	CWADHAWA	BEEF-test Market.Pepper Sticks	8.15
2003064T	CWADHAWA	DAIRY-Commercial of Cheescake	2.15
2003065T	CWADHAWA	MULTI-Nut. Labels/10 froz pizz	0.78
2003066T	CWADHAWA	POULTT,POULTC-Gai Yoh testing	1.15
2003068T	CWADHAWA	WHT-Commercialize Gravy Mix	6.15
2003070T	MSPARBY	MULTI-Moorhead Biodiesel	31.00
2003074T	ADOERING	COPROD-Fiber Opp. for Grasses	2.50
2003076T	CWADHAWA	MULTI-Gluten Free Products	0.65
2003077T	CWADHAWA	BRLY-WHT	1.15
2003078T	MNORRIS	PORK-Pork Spare Ribs	13.90
2003079T	KSANNES	ETH-Feed Lot/Ethanol Plant Fea	19.00
2003080T	CWADHAWA	WHT-Dry Weather Creek	57.65
2003081T	CWADHAWA	TMATO-Green Salsa	0.15
2003082T	CWADHAWA	HONY-Commercial of Hot Wing Sa	3.28
2003084T	ADOERING	FIBR-Fiber Evaluation	62.50
2003085T	ADOERING	COPROD-NGP MN Biomass (willow)	15.50
2003086T	CWADHAWA	SUGR-Flavored Hot Teas	11.28

2003087T	CWADHAWA	MULTI-BBQ sauce nutrit. labels	0.15
2003088T	CWADHAWA	SUGR,DAIRY-Nut. Label/Truffles	0.15
2003089T	ADOERING	COPROD-Ag. Fiber Pellet	15.00
2003090T	CWADHAWA	SUGR-Unique flav/Jams, Jellies	6.15
2003093T	MNORRIS	S.W. MN. State Un.-Mike Rich	0.50
2003095T	ADOERING	COPROD-Ag. Fiber Carriers	135.25
2003096T	MSPARBY	RASP-Raspberry Greenhouse Prod	0.50
2003097T	MSPARBY	MULTI-Hallock Biodiesel Plant	59.50
2003099T	DTIMMERM	PORK-Light-weight Pork Market	94.00
2003100T	ADOERING	COPROD-Product Densification	34.00
2003105T	TSISSON	MULTI-White Earth Production	2.00
2003107T	DTIMMERM	BEEF-Pre-harvest ultrasonic	10.00
2003108T	CWADHAWA	MULTI-Gourmet Food Mixes	0.30
2003109T	CWADHAWA	MULTI-Organic Certification	45.75
2003110T	CWADHAWA	BEEF-Gelbvieh Breed Nutritiona	255.50
2003112T	DBARTHOL	BEEF-Summer Sausage PH	4.00
2003113T	DTIMMERM	POULTT-Shelf Stable Turkey Jer	35.50
2003114T	DBARTHOL	MULTI-Meat & Poultry Shelf lif	44.50
2003115T	ADOERING	CORN-Advanced Corn Stover Tech	9.00
2003117T	ADOERING	ETH-Ethanol Co-Prod./Livestock	81.75
2003118T	CWADHAWA	MULTI-Small Business Dev. Cent	9.00
2003GRANT	MNORRIS	Preparing for Grant Writing Pr	97.00
2003T	MNORRIS	Discovery 2003	124.50
2004001T	MNORRIS	MULTI-HACCP/SOP Cert. Maint.	172.25
2004002T	MSPARBY	COPROD-Mississippi Topsoil Exp	24.50
2004003T	ADOERING	COPROD-Energy Generation Thru	38.00
2004004T	DTIMMERM	MULTI-Corn & Soybean Energy Re	54.00
2004005T	DTIMMERM	CORN-Ultra-Sonic Processing	83.50
2004006T	DTIMMERM	POULTT-Turkey Co-Product Dev.	107.00
2004007T	DTIMMERM	CORN/SOYB-SW.MN.Biopolymers	112.50
2004008T	DTIMMERM	PORK-Ultrasonic Imaging	29.50
2004009T	MNORRIS	COLLAB-AURI/NCBA Collaboration	1.00
2004010T	CWADHAWA	WHT-Co-Man. Indian Flat Breads	1.30
2004011T	EWENE	MULTI-Mulch Development	49.00
2004012T	EWENE	SBEET-Sugar Beet Pre-processin	27.00
2004013T	JCRAWFOR	EDUC-Omega 3 Conference presen	55.25
2004014T	JCRAWFOR	COPROD-Market/omega3 chick&egg	6.00
2004015T	ADOERING	COPROD-Envirogro Solutions, In	12.25
2004016T	DBARTHOL	FFA-Sci Competition-2004	34.75
2004017T	MNORRIS	SOYB-Soymor: tests/Biodiesel	44.50
2004019T	DTIMMERM	BUFF-Buffalogal Bison	7.00
2004021T	MSPARBY	SOYB-Low Carb Bakery Goods	28.00
2004022T	ADOERING	COPROD-Ag. Biomass Collection	6.00
2004023T	DTIMMERM	BEEF-Value-Added Beef Cuts	2.50
2004024T	MNORRIS	COPROD-Value-Added Co-Products	22.00
2004026T	DTIMMERM	SOYB-Environmental Dust Contro	255.50
2004027T	CWADHAWA	DAIRY, SUGAR-Organic Ice Cream	12.00
2004028T	MNORRIS	COLLAB-2003 Client Survey	26.50
2004029T	CWADHAWA	MULTI-Meat Product Labels	1.25
2004030T	DTIMMERM	FSMIP Time	182.00
2004031T	MSPARBY	FIBR-Pelletization/Grass Fiber	40.50
2004032T	MSPARBY	WOOL-Raw wool/landscape mulch	77.50
2004033T	CWADHAWA	PORK/POULTRY-Cooked Sausage	54.30
2004034T	ADOERING	COPROD-Swine Odor Analysis	12.50
2004035T	ADOERING	MULTI-Aqua Innovations	22.00
2004036T	CWADHAWA	SUGR,DAIRY-labeling/Chocolates	13.20
2004037T	MSPARBY	COPROD-Industrial Degester	72.00
2004038T	CWADHAWA	WHT-Nutrit.Labeling/Pita Bread	5.00
2004039T	CWADHAWA	WHT-Dev./Low Carb Bread	18.75
2004040T	CWADHAWA	WHT/FLAX-Low Carb Breads	38.00
2004041T	MSPARBY	SOYB-Central MN Soybean Proces	40.50
2004042T	JCRAWFOR	SOYB-Cheryl Niemela	11.00
2004044T	DTIMMERM	BEEF-Rhine Lake Product Develo	12.50

2004045T	DTIMMERM	ELK-Elk Meat Marketing	119.50
2004046T	ADOERING	HAY-Native Prairie Grass Hay	22.00
2004047T	ADOERING	CODROD-Bio-Mat for Livestock	21.50
2004048T	DTIMMERM	CORN-Corn Utilization Research	99.50
2004049T	ADOERING	COPROD-EnvirGro Solutions, Inc	8.50
2004050T	DTIMMERM	BEEF-Scottish Highland Organic	5.00
2004051T	DTIMMERM	MULTI-Pork & Beef Process Meat	56.50
2004052T	MNORRIS	MULTI-Recycled Grease/An. Fats	133.00
2004053T	MSPARBY	MULTI-Feas/Optimal size Biodie	52.00
2004054T	DTIMMERM	MULTI-Hybrid Biodiesel/Wind Ap	41.00
2004055T	ADOERING	MULTI-EC2	39.50
2004057T	DTIMMERM	POULTT-Utiliz.turkey litter	14.50
2004058T	CWADHAWA	TRANS FATS-Information Brochur	4.75
2004059T	ADOERING	FLAX-Blue Ribbon Foundation	18.00
2004060T	DTIMMERM	GOAT-Meat Processing Plant	28.00
2004061T	MSPARBY	MULTI-Energy Alley	17.00
2004062T	MSPARBY	FIBR-Fiber Consortium	22.50
2004063T	ADOERING	COPROD-Biomass Feedstock Engin	8.00
2004064T	DTIMMERM	COLLAB-Berkshire Marketing	21.00
2004065T	DTIMMERM	BEEF-SW MN. Natural Beef	12.00
2004066T	MSPARBY	SOYB-Fuel Additive	24.00
2004067T	MSPARBY	CORN-Cellulose Conversion	20.00
2004068T	DTIMMERM	BEEF-Sausage Development	69.00
2004069T	CWADHAWA	DAIRY,SUGAR-Creamy Creations	4.50
2004070T	MSPARBY	CORN-Stover Test Burn	3.00
2004073T	ADOERING	BEANS-Bean Waste Evaluation	1.00
2004074T	ADOERING	FIBR-Prep & Sourcing Agricultu	7.50
2004075T	ADOERING	NUT-Badgersett Research	0.50
2004076T	RPATZER	BIODIESEL-Sm Biodiesel Process	4.50
2004GRANT	MNORRIS	Preparing Grant writing Propos	924.00
2004T	MNORRIS	Discovery 2004	3,829.50
99020T	MSPARBY	DAIRY-Whole Farm Cooperative	0.50
99022T	DBARTHOL	LAMB-Lamb Products Mktg	12.00
99024T	MNORRIS	PORK-Prairie Farmers Coop	0.50
99025T	DBARTHOL	COLLAB-Camas Diagnostic	1.75
99028T	LGJERSVI	MULTI-Medicinal Herbs	0.50
99030T	DBARTHOL	LAMB-Prairie Lamb Co-op	5.00
99032T	JCRAWFOR	COPROD-Liquid Compost	21.50
99039T	MNORRIS	SOYB-Soybean Soapstock as a	176.75
99041T	LGJERSVI	DAIRY-Sheep Milk Cheese	0.50
99056T	MNORRIS	MULTI-Minnesota Slim	93.50
99072T	LGJERSVI	OSTR-Ostrich Market Dev. Prog.	0.50
AIC	EOLSON	AIC Administrative Work	93.75
AIC002TD	MSPARBY	Energy-Animal Waste to Biogas	7.00
AICFEDTIME	MNORRIS	AIC Direct Employee Salaries	264.00
AICTIME	MNORRIS	AIC Staff In-Kind Salaries	1,746.75
PREAIC	EOLSON	PREAIC	18.50
PREAICLABOR	EOLSON	Pre-Aic Labor	1,017.50
PRO1003T	EWENE	Genetics/Blotch Resistance	1.00
PRO1006T	EWENE	Control Aster Yellows	1.00
PRO2003T	EWENE	Pro Time for 2003	56.50
PRO402G	EWENE	On Farm Pesticide Reduction	5.50
PRO806T	EWENE	Resist of Barley Germplasm	3.50
PRO807T	EWENE	Imp of Bio Control & Comp Pest	2.00
PRO901G	EWENE	Novel Seed Tretaments Veg Crop	1.00
PRO901TP	EWENE	Novel Seed Treatments Veg Crop	2.00
PRO903T	EWENE	Reduce Insecticide Use-Cabbage	2.00
PRO904T	EWENE	Mgmnt Corronwood Leaf Beetle	1.00
PRO905T	EWENE	Crop Rotation Canola Disease	1.00

Total Projects:

245 Total Direct Project Hours:

14,956.75

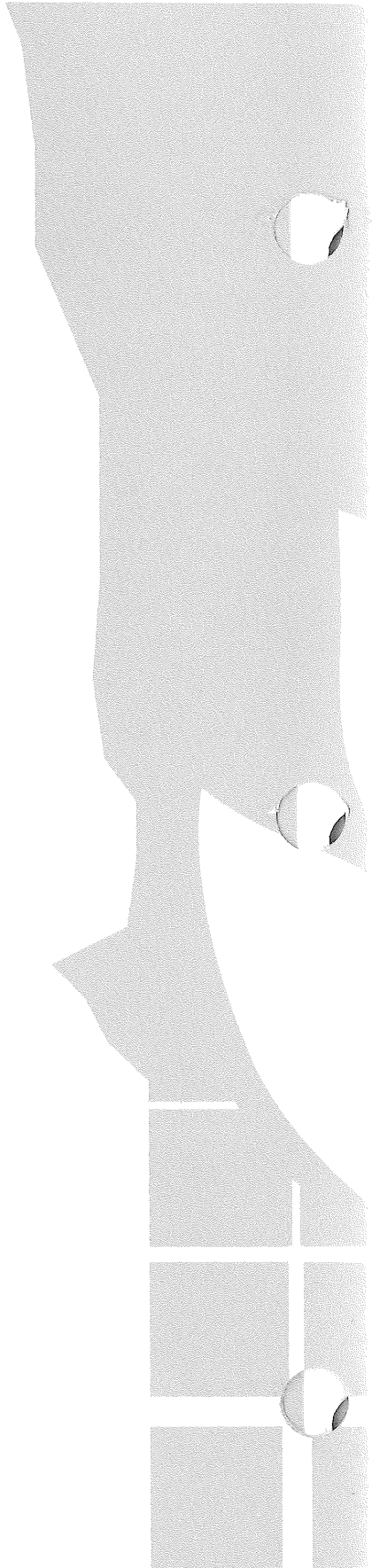


Dan Lemke
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Agricultural Utilization Research Institute

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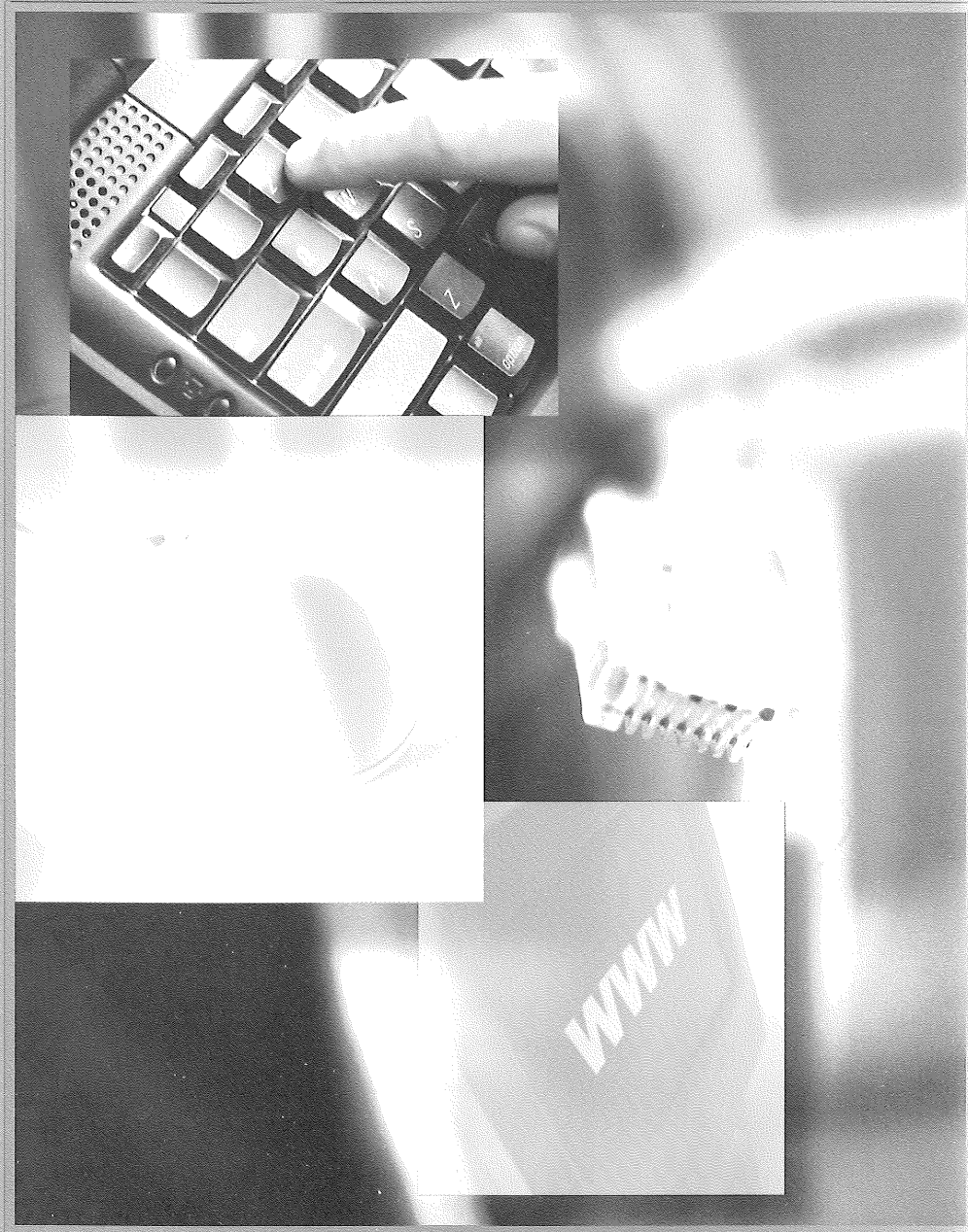




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A Broadband Strategy for Minnesota



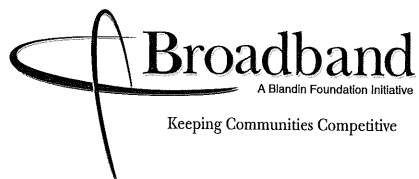
Keeping Communities Competitive



Broadband

A Blandin Foundation Initiative

Keeping Communities Competitive



The Blandin Broadband Initiative is designed to catalyze broadband investment and use, to raise awareness about the value of broadband and to encourage public and private investment in rural broadband capacity. It is led by a 15-person strategy board representing private and public sector partners and stakeholders.

Our Mission

Strengthen rural communities in Minnesota

- Partner with and respond to the Grand Rapids community
- Help create viable rural communities throughout Minnesota

Our Aim

Healthy communities grounded in strong economies
where the burdens and benefits are widely shared

Our Approach

Community Economic Advantage

Our Strategy

Develop leaders and focus communities to identify, align
and mobilize their assets and opportunities

Our Role

Community leadership development, public policy
and engagement and grantmaking



BLANDIN FOUNDATION™

Blandin Foundation is a private independent foundation based in Grand Rapids, MN. Its purpose is to strengthen rural Minnesota communities, particularly the Grand Rapids area, through grants, leadership programs and public policy initiatives.

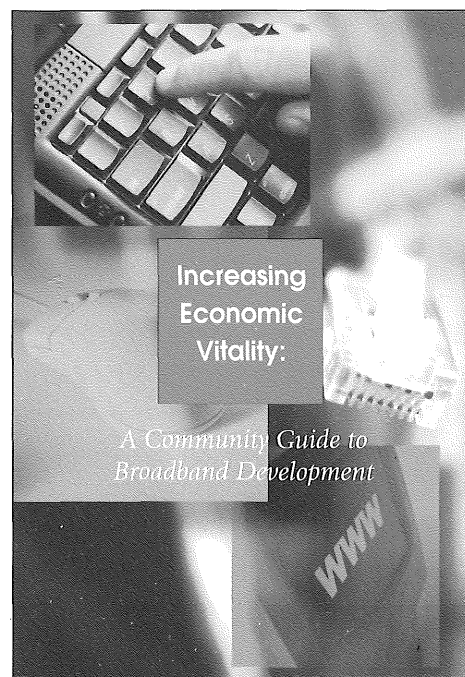
www.blandinfoundation.org

The Blandin Broadband Initiative, a statewide public-private partnership, was created to help Minnesota communities seize the economic development opportunity made possible by broadband technology. By expanding the use of broadband technology, we increase the potential to retain jobs in rural areas, grow new markets for business, strengthen health care, enhance educational access and improve quality-of-life.

Blandin Foundation, which launched the Broadband Initiative in 2003, has:

- Created a strategy board of public and private leaders to guide the initiative
- Dedicated \$250,000 toward a \$1 million Broadband Development Fund. The remainder of the fund will be raised from telecommunications companies and others interested in the expansion of broadband capability. Additionally, the Minnesota Legislature is considering a \$2 million proposal to invest in broadband infrastructure where it is not currently available
- Published the *Community Guide to Broadband Development* and is helping local leaders across Minnesota learn more about broadband and explore their options.
- Begun design and development of a community-based broadband utilization program: "Get Broadband: Keeping Communities Competitive."

Community Guide to Broadband Development



To order email: broadband@blandinfoundation.org or call 218.327.8738

Why this? Why now? Do or die.

Broadband technology facilitates economic development and is important to the economic success of many rural Minnesota communities. Broadband has the potential to help transform rural communities into centers of innovation and technology.

As Joel Kotkin says in *The New Geography*, "The real question for communities is what role they can play in this new information economy. Those that find niches will thrive; those that don't are doomed to stagnate or decline."¹

Industry leaders, public officials and community leaders have the opportunity to join forces to facilitate broadband development and to encourage its use.

Broadband: High-speed, always-on

Simply defined, broadband is an always-on, high-speed Internet connection that allows users to download and manage large files and data quickly and easily. Whether it is used by entrepreneurs to engage in E-commerce or by doctors to share X-rays, broadband significantly increases efficiency. It allows businesses to manage finances and operations online and to compete more broadly in larger markets. It provides residents with greater access to information, entertainment and the opportunity to telecommute in their jobs.

¹ Kotkin is the author of *The New Geography*, senior fellow at the Davenport Center for Public Policy at Pepperdine University and former columnist for the NY Times.

What's missing? Viable broadband markets.

In the late 1990s broadband providers made significant investments in broadband infrastructure such as DSL, cable and wireless but the idea of "build it and they will come" didn't work. As of June 2002, Minnesota ranked 19th in broadband utilization, but ninth in all types of home Internet service.

Today, underutilization discourages investment and limits the availability of broadband. We have learned that we must invest in infrastructure *and* develop a market at the same time.

A recent Blandin Foundation study found that only 15 percent of the 80 percent of rural Minnesotans with access to broadband service subscribe.

The reality is that people and businesses must be taught how to use broadband - in classes and seminars, through promotional and educational campaigns. In many cases people don't understand the value of the technology, and broadband providers have done a poor job teaching them. Broadband seems too expensive for the perceived value it offers business, government, health care, education and families. We must open their eyes to broadband's potential to strengthen communities and enrich lives - it takes an entire community to capture the benefits of broadband.

Community leadership is necessary to advocate broadband's public value - economic development, health care, education, governmental services - and to identify strategies to develop it.

Gary Evans, president and CEO of Hiawatha Broadband, said it best: "We now reach over 70 percent of the people in Winona, but it took a community vision and the involvement of every sector of the community."

Building a market by educating people is a community's responsibility - like 100 years ago when communities taught their citizens how to use the new "public" utilities of electricity and the telephone. When citizens subscribe and broadband providers invest, opportunities for economic development are created. Everybody wins.

Minnesota success stories

Pioneering Minnesota communities have embraced this new capability and are beginning to reap the rewards for their investment of time and resources. They are illustrations of the potential for broadband to support economic vitality in rural towns of all sizes.

- Hiawatha Broadband Communications (HBC) is the largest provider of data, video and telephone services in **Winona**. Fifty percent of HBC stock is owned by Winona educational institutions that want the company to provide benefits to the community. As a result of early market development and public education, they have one of the highest subscription rates in Minnesota.
- **Pine City** has installed fiber optic cable to connect business, government, health care and educational institutions. A joint powers board will manage broadband services.
- PrairieNet Consortium in **Marshall** planned and implemented a strategy to improve accessibility to broadband and to improve ISP services at reasonable prices. The city changed its charter to allow local municipal utilities to become telecommunications providers. PrairieNet holds annual conferences to discuss emerging technologies.

Luverne conducted a citywide assessment of broadband needs, heavily promoted the use of broadband and now has five service providers offering cable, DSL and wireless services. A "technology road map" will guide the community for the next five years.

- Soon after the disastrous tornado in **St. Peter**, the city entered into an agreement with Hickory Tech from Mankato to install fiber optic cable. The project, funded by the city's electric fund, is a key element of the community's economic development goal of attracting high quality, knowledge-based businesses.
- **Alexandria** Light and Power and Runestone Electric Association, the local electrical cooperative, joined forces to introduce broadband services and are planning to increase the availability of fiber to high volume business and residential users. They have achieved a high level of market penetration by focusing on providing high quality service.

- Broadband leadership in **Willmar** comes from KandiLink, an informal organization whose mission is to assure the area receives telecommunications services that meet citizen needs and keep businesses competitive. In 2000 the city of Willmar became a partner in En-Tel Communications, which initiated a full line of telecommunications services.
- **Barnesville** Municipal Telephone, a division of Barnesville Municipal Utilities, has offered broadband access since 2001. It remains competitive by choosing technologies that are easy to learn and that may be supported by a small staff. BMU now installs conduit with every street project in the community.
- The **Buffalo** Wireless Internet Group provides wireless and fiber broadband services to businesses and residences. The city invested \$1 million in the initial system and \$750,000 in the wireless system. It is now looking at expanding wireless service to adjacent rural areas.

Detroit Lakes Public Utilities created LakesNet to provide businesses and residences with broadband services after its efforts to partner with local ISPs failed.

- In July 2003 the **Windom** City Council approved an \$8 million investment to provide fiber and to carry voice, video and data services to each business and residence. The system will be deployed by the end of 2004. They believe the investment will keep them competitive far into the future.

What people say about broadband

"E-commerce has become a mainstay of our daily business." LCS Precision Molding, Elysian, MN

"With broadband I was able to retain key employees, reduce employee turnover and reduce training costs." Bursch Travel Agencies, Alexandria, MN

"Key communication with suppliers went from several weeks to 30 minutes." Powerain Systems, Tower, MN

"After our community broadband program, we went from no service to five broadband ISPs." Barbara Berghost, City of Luverne, MN

"Broadband services are a big attraction to companies considering relocation to our community." Kirk Bustrom, Itasca Technology Exchange

"Get broadband or stagnate. All advanced companies are bandwidth hogs....All possibilities for retaining an economically vital future requires greater and more affordable broadband," Dr. Robert L. Musgrove, president of Pine Technical College in Pine City and chair of the Technology Committee for the Minnesota State College and University System.





Broadband Initiative Strategy Board

Kevin Beyer

Federated Telephone Co-op

Fred Bursch

Bursch Travel Agency, Inc

John DeCramer

BH Electronics

John Duffy

Hickory Tech

Mark Erickson

City of Lakefield

Gary Evans

Hiawatha Broadband Communications

Bob Gunther

MN House of Representatives

Burl Harr

Minnesota Public Utilities Commission

Matt Kramer

MN Dept. of Employment &
Economic Development

Dennis Miller

Midwest Wireless Holdings

Richard Nordvold

Iron Range Resources

Dallas Sams

Minnesota State Senate

Dick Sjoberg

Sjoberg Cable Company

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Qwest

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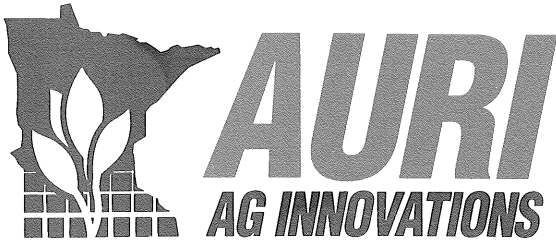
Mayor, City of Pine City



For more information about the initiative or the Broadband Development Fund contact:

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218.327.8738

Patrick Marx & Becky LaPlant
Communications



Agricultural Utilization Research Institute

P.O. Box 599 • Crookston, MN 56716-0599 • 218-281-7600 • Fax: 218-281-3759

January 27, 2005

Senator Richard Cohen
121 Capitol
75 Rev. Dr. Martin Luther King Jr. Blvd
St. Paul, MN 55155

Dear Senator Cohen:

It is good to see you back in St. Paul attending to the state's business as another legislative session gets underway. As with all sessions, there are important decisions that need to be made.

As a member of the Senate Environment, Agriculture and Economic Development Budget Division and/or the Agriculture, Veterans, and Gaming Committee, you have the difficult task of debating issues and overseeing numerous programs that impact rural Minnesota, including the Agricultural Utilization Research Institute (AURI).

While you are likely familiar with AURI, it is important that we keep you up-to-date on our organization. Budget cuts have caused us to streamline and reinvent how we operate without changing our mission and role. As an organization, AURI remains committed to providing technical assistance and feasibility support to value-added ventures that positively impact Minnesota farm producers. Enclosed are two recent articles about AURI, along with a booklet that explains what AURI is about, how we work to improve the economy of rural Minnesota, and how those services have benefited the entire state.

I am hopeful that this information will help you to understand what AURI is all about as you make decisions in the upcoming legislative session. If you have any questions about AURI, please feel free to contact me at (800) 279-5010.

Best wishes in the session ahead.

Regards,

Edgar Olson
AURI Executive Director

Enclosures

Serving Minnesota with field offices in Waseca, Morris, Marshall, and Crookston



AURI — A success that we all can take pride in



The issue:

The Agricultural Utilization Research Institute.

Our comment:

AURI has been a smashing success and will continue to help grow Minnesota agriculture.

No need to mince words when it comes to the Agricultural Utilization Research Institute. The nonprofit corporation established to strengthen the economy in rural Minnesota has been a smashing success.

It is successful because it has consistently helped businesses respond to new and untapped market opportunities associated with new or value-added products. AURI forges partnerships with entrepreneurs, farm groups and researchers. The partnerships have indeed created new business opportunities in rural areas.

AURI evaluates each project proposal on its uniqueness, market viability, use of Minnesota commodities, how many farmers would potentially be impacted, its economic impact and cost savings generated.

AURI's expertise is used in a new venture's infancy, when its ultimate success or failure is unknown. Without its involvement, entrepreneurs would have a much more difficult time turning their ideas into reality.

AURI often flies beneath the radar, because its work is often behind the scenes. It's headquartered in Crookston with offices in Waseca and Marshall. The Marshall office includes a fats and oils laboratory and a meats laboratory. The Waseca site features a coproducts utilization lab.

Even with AURI involvement, new products and business startups aren't guaranteed success. However, farmers and the cooperatives they own have historically been willing to take reason-

able risks to ensure a brighter future. The original cooperative movement — initially controversial in certain circles — helped farmers gain more equal footing in the marketplace and forced suppliers, railroads and lenders to treat them more fairly.

Farmer-owned cooperatives also benefited consumers because the products they produced were more diverse and responded to changing consumer needs.

There have been failures, of course. Those old enough to remember aren't likely to forget the great Jerusalem artichoke caper of the late 1970s and early 1980s. Promised markets, many farmers planted artichokes and produced a crop for a market that didn't exist. The early visionaries who attempted to establish small ethanol plants also suffered from market setbacks.

However, their vision was picked up and turned into reality by new cooperatives who benefited from technological upgrades and the public's greater understanding of ethanol's benefits to create a booming industry that promises to benefit so many rural communities as well as the environment.

AURI began as a noble experiment in cooperation and partnership. It, too, is a remarkable success story that all Minnesotans can be proud of. No one can be certain what tomorrow's agriculture will look like, but rest assured that AURI's partnership with farmers and industry will make the industry better for everyone involved.

AGWEEK

MARKETS • NEWS • POLICY • PROGRAMS

VOLUME 20, NUMBER 21 / Monday, December 27, 2004

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■ Trucking shortage creates demand for rail shipments. / Page 32



Mad cow

■ Consumer confidence high one year after BSE discovered in cow in Washington state. / Page 36

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Eric Hylden, staff photographer

COVER STORY

AURI refuels

■ Minnesota nonprofit organization heads into its 16th year with energy

▲ AURI executive director Edgar Olson talks about the mission of the Minnesota ag research institute based at the University of Minnesota-Crookston.

CROOKSTON, Minn. — Getting slimmer has energized the Agricultural Utilization Research Institute.

Budget cuts have forced the nonprofit organization, like many other state-funded Minnesota agencies, to tighten its belt and take a hard look at its priorities. The 2003 Minnesota Legislature reduced AURI's budget for the 2004 to 2005 biennium from \$3.9 million to \$1.6 million.

AURI, which celebrate its 15th anniversary this year, was created by the Minnesota Legislature under the former Greater Minnesota Corp., a public organization that was developed to find markets for Minnesota markets and commodities. In 1989, the Greater Minnesota Corp. ran into financial trouble and AURI was spun off into a nonprofit corporation with its own budget.

"The original funding was direct state appropriations along with grants," says Edgar Olson, AURI executive director in Crookston. Now, the state

■ AURI: See Page 34

Story by Ann Bailey, Agweek staff writer

IN NEXT WEEK'S ISSUE: AT ODDS OVER GOVERNMENT PAYMENTS

AURI

Continued from Page 1

provides one-third of the funding, and private grants make up the remainder of AURI's \$4.6 million 2004 to 2005 budget.

Seeking funding

Although the budget cuts haven't changed the nonprofit corporation's mission, they have altered the way the agency operates, Olson says. For example, searching for grants is a big challenge for AURI and takes up a lot of staff time, he says. Staffers scour public and private sources for the grants.

"You just kind of cast your line out there and hope you find something," Olson says. "They can be big and they can be small."

One of the biggest AURI has landed is a \$760,000 grant it was awarded last fall from the Excel Energy Renewable Development Fund to research combining biodiesel with wind power to create energy. AURI is partners in the project with the Minnesota Soybean Growers Association of Mankato, Minn., and the Center for Diesel Research at the University of Minnesota in St. Paul.

AURI also was awarded a \$1 million grant from the U.S. Agriculture Department for its Ag Innovations Center/Center for Producer-Owned Energy. The grant is for development of alternative energies such as biodiesel that are derived from agricultural sources such as plants and animals oils.

Energy outlook

Olson sees additional opportunities down the road for biodiesel-related projects. A 2002 legislative mandate to use 2 percent biodiesel in its diesel products by 2005 has created interest among manufacturers to develop the fuel made from grains such as soybeans.

Minnesota already has biodiesel plants in Brewster, Albert Lea and Redwood Falls. Olson expects that having a hand in development of alternative energy sources will remain an important part of AURI's focus.

"Anything that deals with energy is kind of the buzzword," he says. "Right now, close to half of



Eric Hylden, staff photographer

▲ A sampling of the AURI products produced in Minnesota.

AURI SUCCESS STORIES

- Pet Care Systems, Detroit Lakes, Minn., which manufactures Swheat Scoop, a cat litter made from nonfood grade wheat.
- SoySoft, Edina, Minn., which manufactures hand and body lotion and hand crème from soybean oil.
- Bolt Enterprises, a group of high school students from Westbrook-Walnut Grove (Minn.) High School that produces and market Prairie Smoke Bar-B-Que Sauce.
- Minnesota Soybean Processors, a group of 2,400 farmers who own a soybean crushing facility in Brewster, S.D.
- Mississippi Topsoil, a Cold Spring, Minn., company that makes products such as compost and potting soil from waste from the Gold N' Plump chicken processing plant in Cold Spring.

Source: Agricultural Utilization and Research Institute

AURI names associate director for its energy center

The Agricultural Utilization Research Institute's Center for Producer-Owned Energy has hired Thomas Melin as its associate director.



Melin

Melin will work on renewable energy projects for the center at its Crookston headquarters. The center, an independently governed entity affiliated with AURI, was created by a grant from USDA to support producer-owned energy.

Melin, a former University of Minnesota regional extension educator, sees great potential for renewable energy.

The state, with its wood production industry and production of commodities such as soybeans and corn, is at the forefront of renewable energy production, he says.

His goal is to help make the renewable energy products available as well as affordable. Developing successful products not only will benefit the public who uses the energy, but also the farmers who produce the commodities.

"Given the times we're in, with the high cost of fuel, we need to be proactive in supporting opportunities that can benefit producers. Renewable energy is on the forefront and research is going to play a part in developing those opportunities." □

— Ann Bailey

AURI's budget is going to energy projects.

AURI in Crookston is taking a hard look at alternative uses for its equipment, which is geared toward vegetable processing. It now appears commercial vegetable production, once believed to be a potential economic boon to northwest Minnesota farmers, is not well-suited for production on the region's heavy, clay soils, Olson says.

As AURI increases its focus on energy projects, the nonprofit organization also will continue to expand the number of its partnerships with agricultural organizations such as commodity groups. The partnerships are a way that AURI can reach the greatest number of entrepreneurs, Olson says. The projects of most individuals aren't large enough to launch as a business and AURI no longer has staff available to do processing in-house.

Getting leaner

Staff positions also were a casualty of the reduction in funding and the number of employ-

ees at AURI's facilities in Crookston, Waseca and Marshall dropped from a total of 37 to 18 this year.

Those staff reductions combined with the budget cuts means that "the center can't be everything to everybody," Olson says. "We have to focus on the area where we have the largest impact."

Still, Olson says, AURI has not turned any individuals away and still offers them technical assistance.

"We don't want to leave the cottage industry behind," Olson says. "There are a lot of people we help." Sometimes that means providing people with technical assistance to develop their product. Other times it may mean telling people their projects don't have market potential.

"Our job is to kind of determine if they are feasible, both from a financial and technical perspective," Olson says.

A marketing group made up of students at Southwest Minnesota Technical College in Marshall researches peoples' ideas to

■ AURI: See Page 35

AGRICULTURAL UTILIZATION RESEARCH INSTITUTE FACTS

■ AURI was created in 1988 under the umbrella of the Greater Minnesota Corp. and was spun off as a separate nonprofit corporation in 1989. AURI's northern office and state headquarters are in Crookston. The southeast office is in Waseca, while the southwest office is in Marshall.

■ AURI's goal is to foster long-term economic benefits and employment opportunities for rural Minnesota through: 1) The identification and expansion of existing markets for new or existing commodities and products. 2) The development of new uses or value improvements for Minnesota agricultural commodities. 3) The development of more energy efficient natural resource saving production practices.

■ AURI staff provides assistance for development of agricultural-based products in Minnesota. Assistance includes technical assistance, product feasibility testing, process evaluation and access to laboratory facilities.

■ The three AURI facilities have laboratories that focus on development of different products.

■ AURI's fats and oils laboratory focuses on value-added products and its meat lab is used for formulation and analytical assessment of animal products. The Marshall facility also includes equipment for developing new

products and assists meat and poultry processors with meeting federal regulation and provides Hazard Analysis Critical Control point training.

■ The co-products utilization lab, used for the development of new uses for plants and animals is in Waseca.

■ The Crookston AURI facility houses the commodity and industrial ingredients laboratory where staff provide assistance to Minnesota businesses in an effort to increase the utilization of agricultural commodities. □

Source: Agricultural Utilization Institute 2004 Resource Guide

AURI

Continued from Page 34

determine marketability.

"You have to turn over every rock you could possibly find so there's not someone down the road who's producing and selling it for half the cost," Olson says. "A lot of the successes we have are probably the ones where we prevent someone from making a mistake and losing all of their life savings."

New philosophy

That philosophy is a change from the days when AURI lent individuals money,

no matter their project's potential marketability.

"We were kind of the borrowers of last resort," Olson says, adding that practice wasn't a wise use of taxpayers' money.

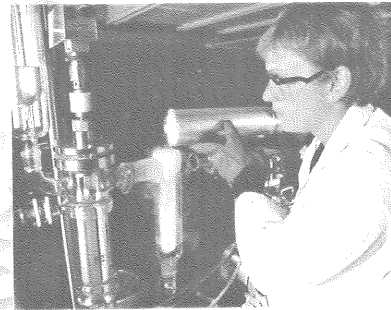
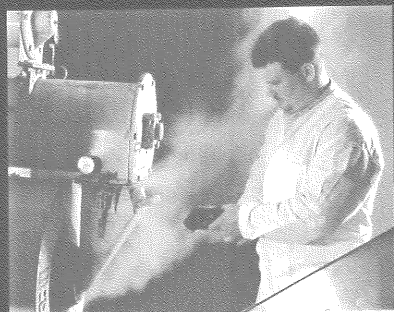
Besides energy projects that use Minnesota commodities, AURI also is looking at helping people identify a specific ingredient in their projects that might have some kind of health food benefit that would increase their marketability. Meanwhile, the nonprofit organization is considering conducting research with nutraceuticals, foods that contain medicinal properties.

"We're looking at every avenue possible," Olson says. □

2005 AURI Profile



Agricultural Utilization Research Institute



**AGRICULTURAL UTILIZATION RESEARCH INSTITUTE
2005**



message from

THE EXECUTIVE DIRECTOR

More than 15 years ago, a broad-based group of Minnesotans came together with a single mission: to create a unique and innovative organization with the express purpose of developing new uses for agricultural commodities.

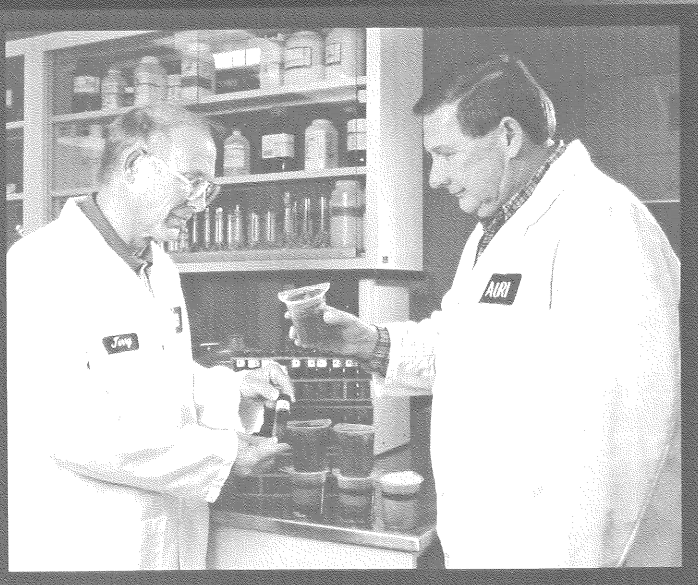
The group included agricultural leaders, commodity groups, business leaders and lawmakers. This planning resulted in the formation of the Agricultural Utilization Research Institute.

Since it began operating as a state-supported nonprofit corporation in 1989, AURI has impacted hundreds of businesses, tens of thousands of Minnesota producers, and essentially every person in the state. AURI serves as the research and development arm for Minnesota agriculture. Value-added agriculture generates millions of dollars in revenue every year, stimulating vital economic activity from Roseau to Rochester. That activity impacts businesses, schools and communities, not just those who are involved in farming.

AURI provides unique services to spur the development of new uses for agricultural projects in an effort to open new markets for the state's farm commodities. Value-added uses that offer new opportunities for growers help to keep their operations profitable and competitive. AURI's feasibility testing and product development assistance is designed to increase the likelihood a product or process will be commercially successful.

Minnesota is a different state in 2005 than it was in 1989, but the demand for AURI services and the need to continue spurring economic activity has not changed. Neither has AURI's commitment to providing needed support and leadership of emerging value-added opportunities.





AURI mission

AND PROFILE

AURI was created to improve the economy of rural Minnesota through the development of new uses and new markets for the state's agricultural commodities.

The Agricultural Utilization Research Institute (AURI) was created by the legislature in M.S. 1160.09. AURI efforts are focused on developing and increasing value added opportunities to ag processors, cooperatives, existing businesses and rural start-ups. This is accomplished by providing:

- project development services
- applied research assistance
- new product development
- feasibility assistance

Assistance is generally provided at the very early stages of product or process development, with a strong emphasis placed on determining technical and market feasibility. AURI services assist producers and processors in making informed decisions about allocating scarce resources.





AURI

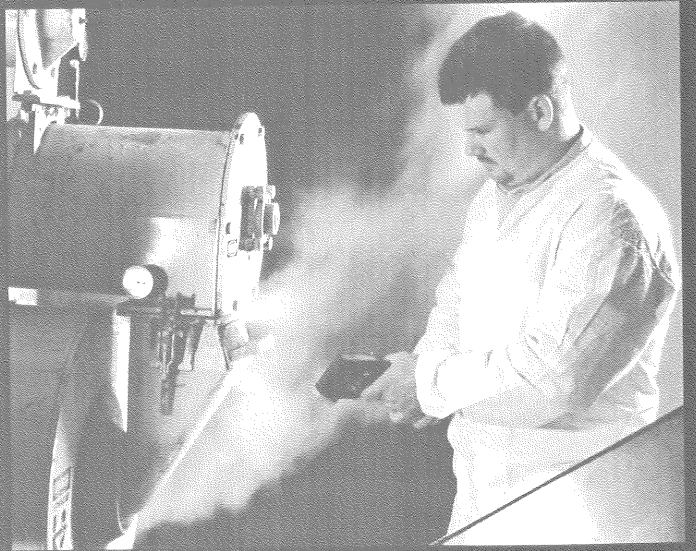
CORE FUNCTIONS

The Agricultural Utilization Research Institute provides technical and applied scientific services to individuals and organizations that are developing value added businesses across Minnesota.

Core functions include:

- * Providing technical and feasibility assistance, laboratory and pilot plant services in support of the development of value-added processing in Minnesota;
- * Acting as the applied research and development service for small and medium-sized commodity processors; and
- * Promoting, educating and informing agricultural stakeholders about the rewards and risks of participating in value added processing; and
- * Due diligence assistance to determine if further time and resources should be put into a project.





AURI

OPERATIONS

AURI serves a variety of clients including producers, producer groups, cooperatives, small and medium-sized commodity processors and entrepreneurs.

AURI field staff assists with project development activities, while laboratory and pilot plant staff support the technical elements of project development. Pilot plant and lab activities assist clients with feasibility, testing, analysis and product scale-up activities.

AURI's facilities are strategically located throughout the state to enhance service delivery and client access:

- * Crookston: product development lab; state headquarters
- * Marshall: Center for Producer-Owned and Renewable Energy; fats and oils lab; analytical and process labs; meat lab
- * Waseca: co-products utilization lab and pilot plant

Program Areas

Client services include project development services, laboratory operations such as analytical, process, meats, fats and oils labs, as well as limited pilot plant operations and development grants for projects.

Industry initiatives focus on broad impact areas and include biodiesel research, ethanol co-products projects, agricultural energy & side stream research, and other feasibility projects that have the potential to impact a large number of producers.



AURI

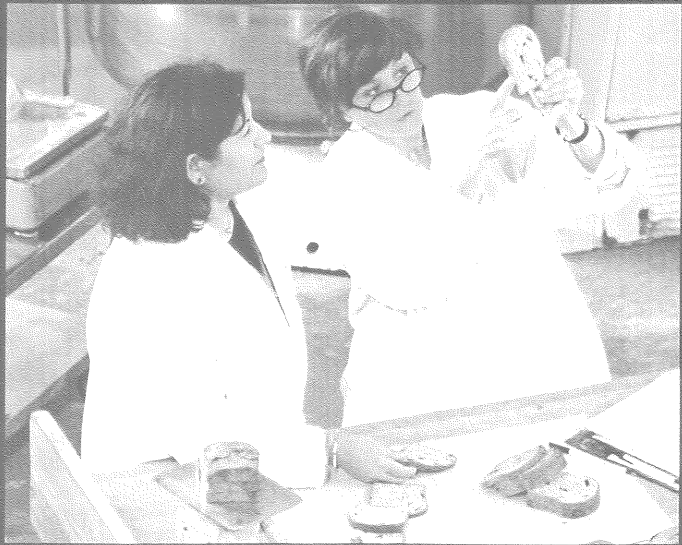
IMPACTS

URI works with Minnesota companies in an effort to create new markets for agricultural products grown here in the state.

Our main goal is to impact the economy of the state and assist the producers who raise the crops by moving ag-based, value-added products into the marketplace.

- * Over 20,000 producers impacted through assistance with project feasibility assessment and information;
- * Early-stage project feasibility and assessment services resulting in a combined infrastructure investment potential of \$40 - 100 million;
- * Over \$8.33 million of outside investment dollars were leveraged by AURI project expenditures for applied research and market development over the past biennium;
- * Over 1000 new value-added processing jobs from AURI project development and technical services activities, as reported directly from clients.





client

FEEDBACK

URI proudly works with some of Minnesota's most innovative companies.

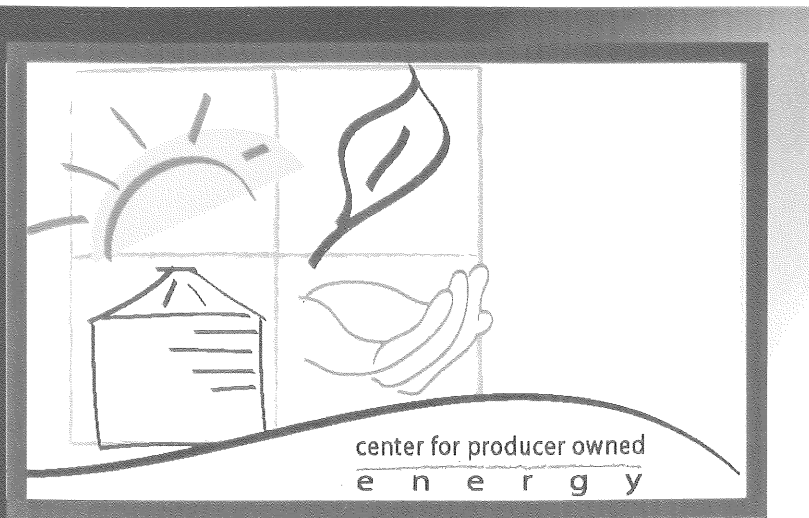
These are businesses that are working to add value to farm commodities by identifying new market opportunities. In many cases, these opportunities are the result of changing technology and market conditions.

Most of our clients will tell you they are where they are today because of the assistance provided by AURI. Nearly all agree that continued support of AURI is important for keeping rural Minnesota strong.

Here is what several of our clients said about AURI in a recent customer satisfaction questionnaire.

- *"AURI provides the agricultural business base in Minnesota access to personnel, production improvements and testing that other states do not provide."*
- *"They have been the 'one stop shop' to get answers, samples made and to recommend or refer us to other people we should be talking to. Without AURI's help, I know we would not be anywhere close to where we are now."*
- *"AURI's help in the beginning is responsible in a significant way for the successful development of our company. Being there with all the answers made the significant difference between success and failure of this company."*
- *"There are ideas out there that are not funded by large corporations. Without AURI, the ideas will not become reality and the public will not benefit from them."*
- *"If the state of Minnesota does not continue to help small businesses and entrepreneurs, then the Wal-Marts and other big corporations will gain total control of the sector of the economy that small businesses now have."*





center for

PRODUCER- OWNED ENERGY

URI operates a
USDA-funded
innovation center to
further ag-based
energy in Minnesota

AURI was selected as one of only ten recipients from across the country to be awarded USDA funding for the establishment of an Agricultural Innovation Center. These \$1 million competitive grants were awarded to help develop value-added opportunities for the nation's farmers.

The mission of the Center is to support the creation and development of producer-owned value-added businesses related to the production of renewable energy and the utilization and marketing of related co-products and byproducts. Funded through the USDA, the Center enhances the ability of producers to successfully capitalize on emerging markets for renewable energy. The Center focuses on the development of renewable forms of energy, particularly liquid transportation fuels such as biodiesel and ethanol, and electricity generated from biomass and manure digestion.

