09 - 1029

University of Minnesota:
Partners with Minnesota Agriculture

February 4, 2009
Agriculture, Rural Economies and Veterans Affairs Finance Division Committee

UNIVERSITY OF MINNESOTA
Driven to Discover℠

Agriculture is Vital to Minnesota's Economy

- $9.3 billion crop and livestock sales
- 20% of all MN exports
- $55 billion of economic activity *
- 367,000 jobs *

Source: Minnesota Department of Agriculture

*** With multiplier effect**

We Listen to our Agricultural Partners

- Agricultural Organizations
- State and Federal Agencies
- Minnesota Legislature
- Producers

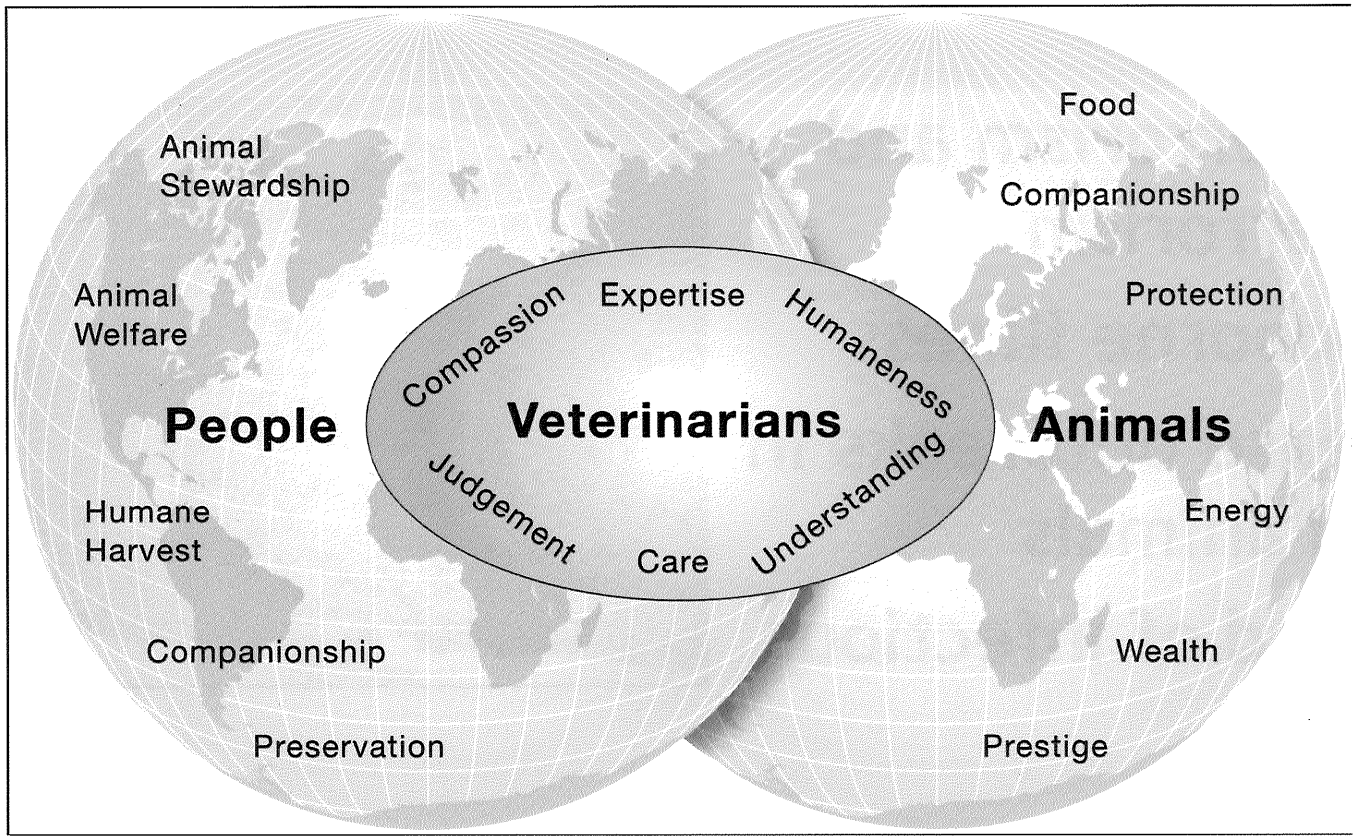
Responding to the Needs of Minnesota Agriculture

Trevor Ames - Dean of the College of Veterinary Medicine

Al Levine - Dean of the College of Food, Agricultural and Natural Resource Sciences

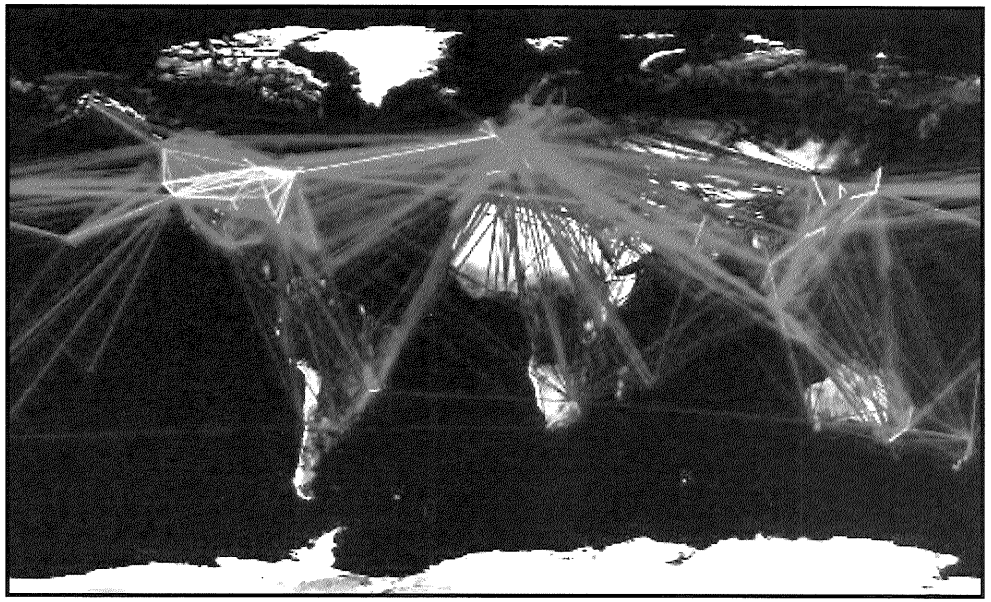
Bev Durgan - Dean of UM Extension & Director of MN Agricultural Experiment Station

Today's Veterinary Medicine



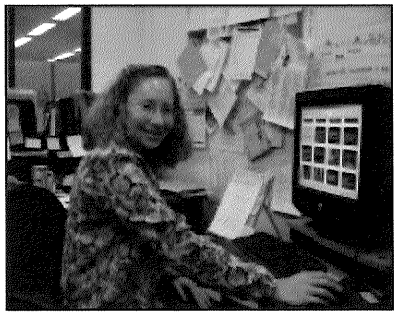
Responding to Animal and Human Health Threats

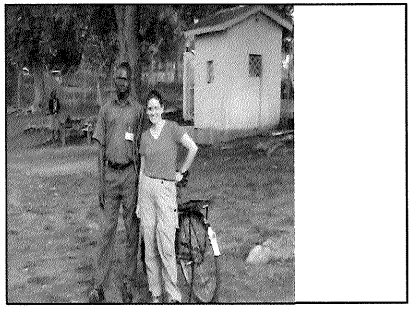
- Agroterrorism and bioterrorism
- Foodborne illness
- Disease outbreaks in food animals
- Spread of infectious disease

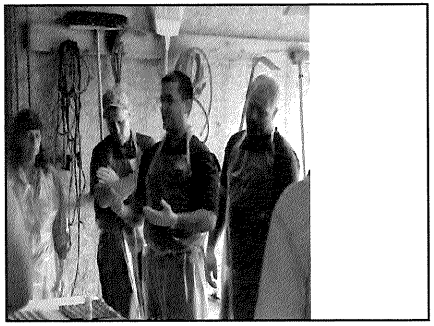


Critical Role of Public Health Veterinarians

- Vital role in control of food borne and animal diseases transmitted to people
- Valued for their understanding of new/unusual disease agents (i.e., West Nile virus and influenza)
- Needed to prepare and respond to disasters
- UM has largest DVM/MPH program in the nation







College of Veterinary Medicine Research Focus

Emerging infectious and zoonotic disease

- Food borne
- Economically important diseases of food animals

Population Systems

- Livestock health
- Food Systems
- Ecosystem Health

Comparative Medicine

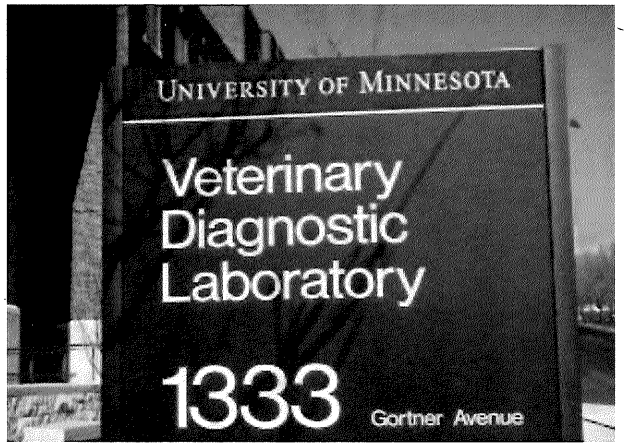
- Animal Models of Human Disease

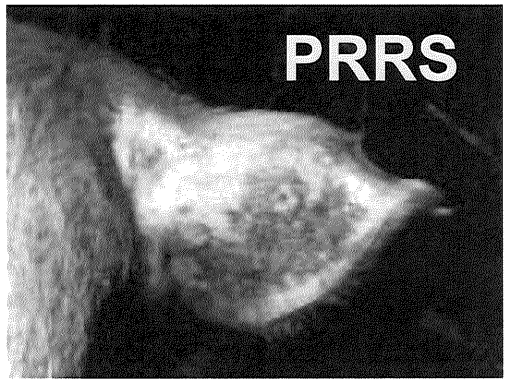
University Role in Bovine TB

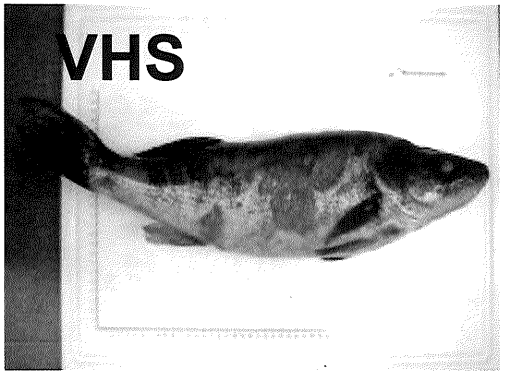
University partners with state to find solutions and educate producers and public

- Provides research and extension expertise
- Part of Bovine TB Multi Agency Coordination with USDA, MDA, DNR, BAH
- Finding answers with additional funding
- Mobilize state, regional and local team of Extension and research faculty
- Provides research and extension information through website, meetings, publications, interviews

Veterinary Diagnostic Lab: Surveillance Capacity







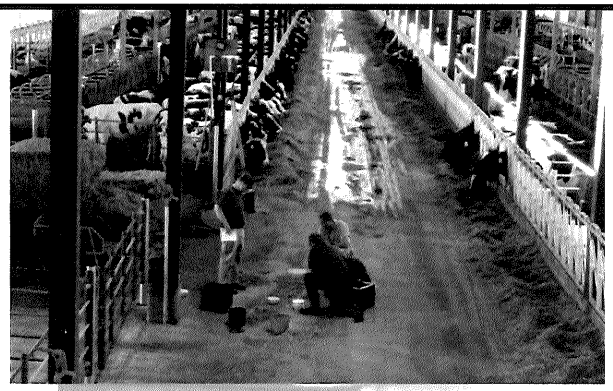
Veterinary Diagnostic Lab: A Critical State Asset

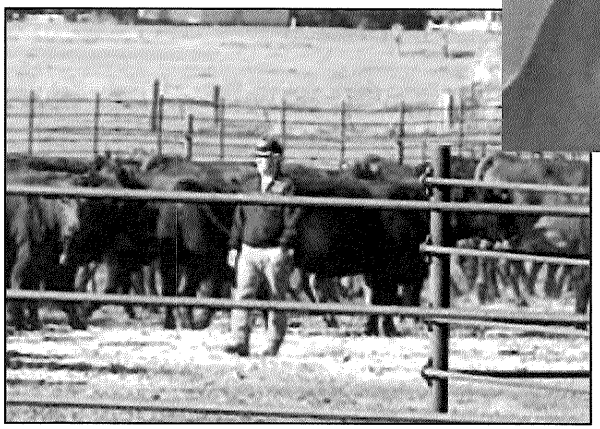
$900,000 in state support funded:

- **TB eradication efforts**
- **Avian influenza emergency preparedness**
  (including operating expenses of a biosafety level 3 necropsy laboratory)
- **Quality assurance program enhancements**
  (mandated by the American Association of Veterinary Laboratory Diagnosticians Accreditation Committee)

Strengthening MN Livestock CVM Federal Requests

National Veterinary Dairy Education Center





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MICHIGAN STATE UNIVERSITY

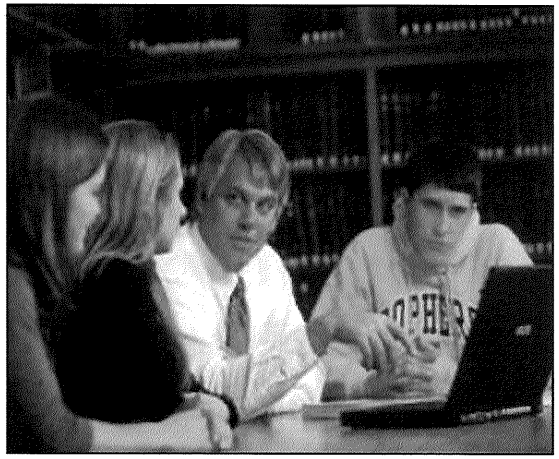
Bovine Tuberculosis

Solving the Food Animal Veterinarian Shortage

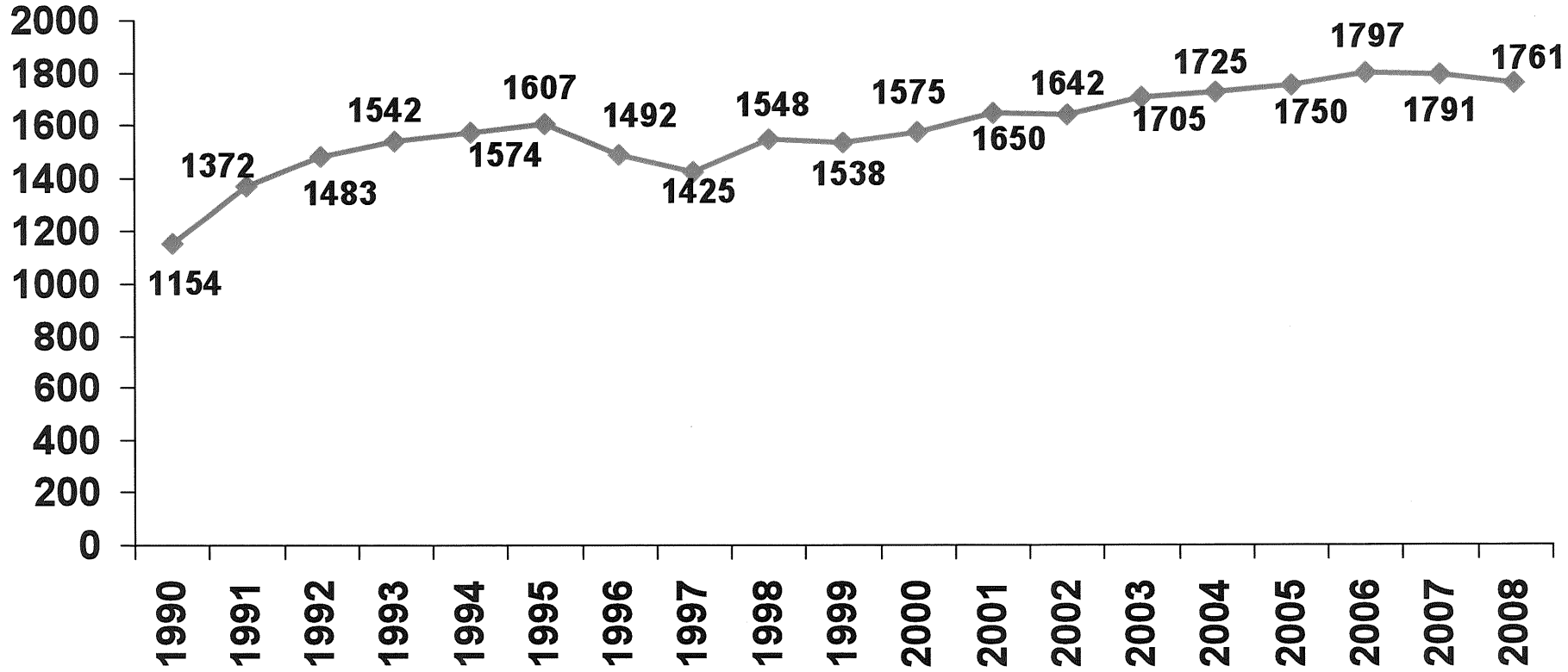
- **VetFAST** - Recruit and retain students with food animal interests
- **Admissions** - Selection process that considers multiple success factors, not just academics
- **Leadership Training** - Prepare future veterinarians for leadership roles (student mentoring/professional skills)
- **Experiential Education** - Get students out of the classroom and into the "real world"
- **Loan Forgiveness** - Meet the needs of MN's underserved areas to provide food animal veterinary care

Student Enrollment - CFANS

- 1,761 undergraduates
- 14 majors & 22 minors
- 700 graduate students
- 13 graduate programs



Undergraduate Enrollment 1990-2008



Students Compete Nationally

- Livestock judging teams
- Food product development team
- Dairy judging team
- Turf Club
- Alpha Tau Alpha (Ag Ed professional society)
- FFA - 4 of 6 state officers are CFANS students

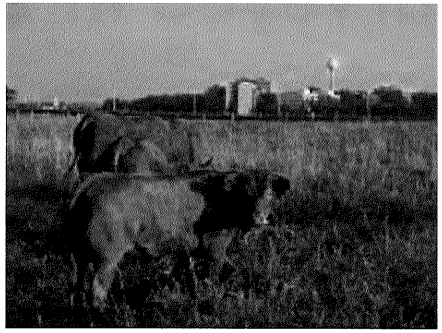
Educating the Next Generation of Agricultural Leaders

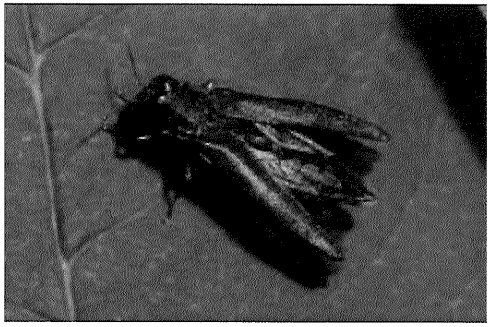
CFANS Students surveyed in 2007:

- *94% of students found a job within 6 months of graduating*
- *46% offered jobs prior to graduation*
- *61% of the jobs related to their majors*
- *Salary mean - $39,340*

Recent & Future Investments in Agriculture, Food & Health

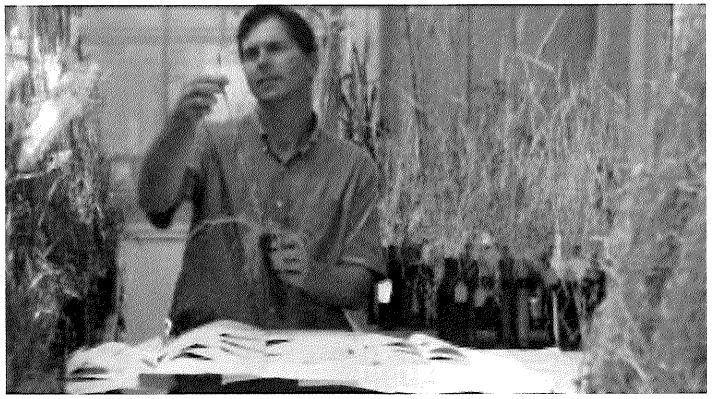
- Cropping systems
- Livestock
- Renewable Energy
- Food Safety
- Beef Reproduction
- Organic & alternative agriculture
- Invasive species
- Forest Entomology



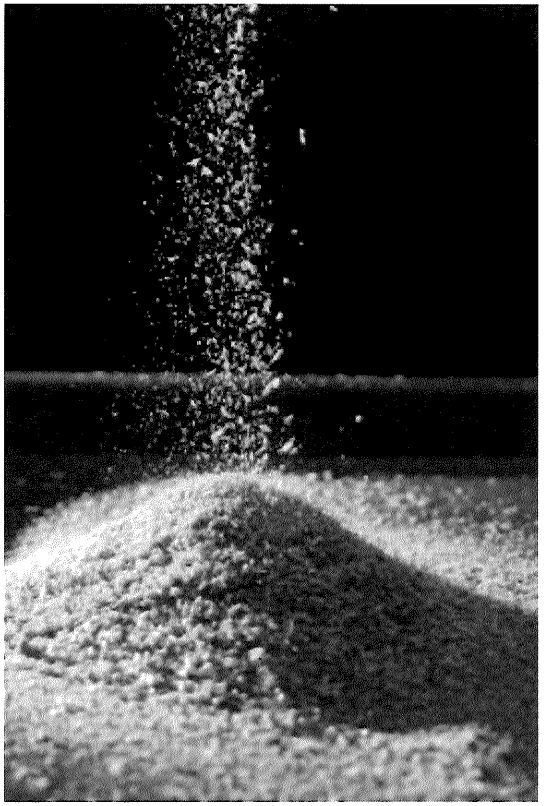


Providing Plant Varieties for Minnesota

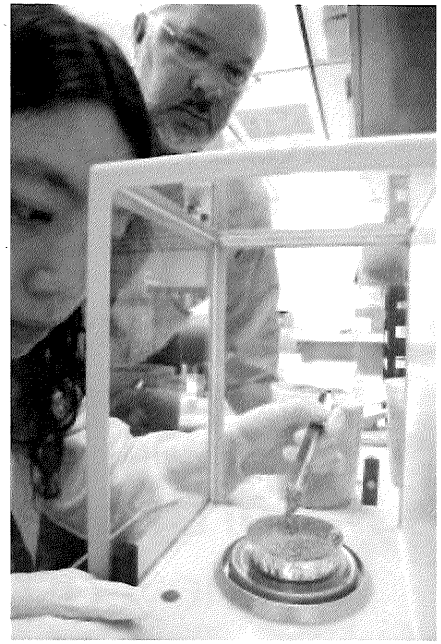
- **Tom Wheat** - moderately resistant to Ug99, deadly strain of wheat stem rust
- **RB07 Wheat** - high yield and protein
- **Rasmusson Barley** - high malt extract and yield
- **Horticultural Varieties** - Honeycrisp apple



Producing Energy with MN Agriculture



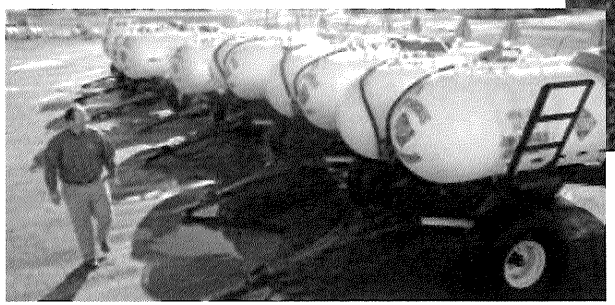
- Ethanol and biodiesel byproducts
- Biomass systems
- Economics
- Building conservation
- Carbon credits
- Wind systems



Putting Wind to Work

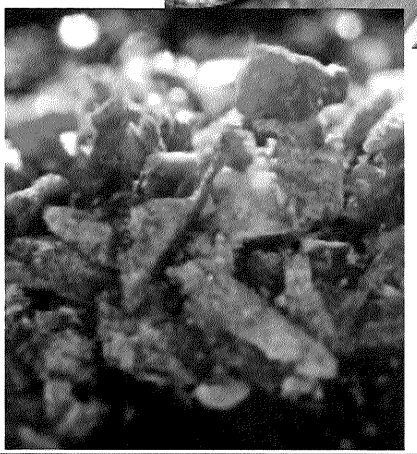
Researching techniques and economics of using wind to produce hydrogen

Goal: produce anhydrous ammonia fertilizer



Solving the Honey Bee Shortage

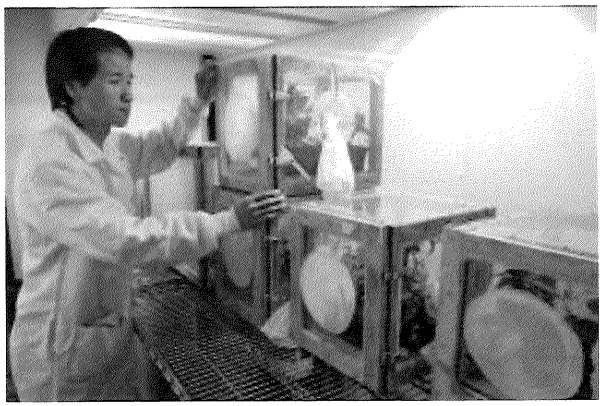
- 1/3 of our food depends on pollinating honey bees
- Honey bee propolis might have life-saving properties
- U of MN has one of the few remaining bee research labs in the country

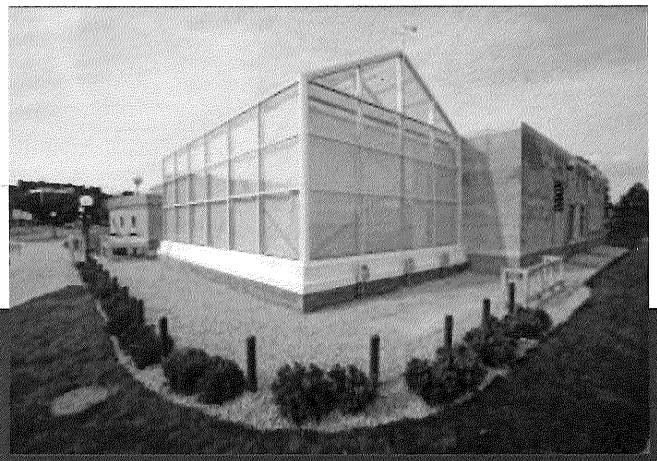


Protecting the State

University of Minnesota - only land-grant university with:

- **Insect Quarantine Facility**
  Beneficial insects to control soybean aphids, buckthorn, garlic mustard
- **Plant Pathogen Quarantine Facility**
  Ug99 Wheat Stem Rust, Asian Soybean Rust and Sudden Oak Death





In partnership with:

Minnesota Department of Agriculture

Taking UM Research to the Field

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Reducing Soybean Aphid Damage

Research based information to solve problems:

- Better control decisions today
- Long term control through beneficial insects

Economic Impact:

- $200 M annual crop losses
- Potential to generate $1.3 billion over 15 years

(Michigan state study)

In partnership with

Minnesota Soybean Research and Promotion Council

Providing Financial Expertise

- 200 Minnesota banks, 700 producers,
  90 MnSCU farm advisors use FINPACK software

- 5,000 Minnesota producers improved marketing skills through Winning the Game

  Offered in partnership with: Banks, cooperatives, crop insurance agencies, etc

- 2,000 new Farmer-Lender Mediation cases

  13% increase over the average of last six years

Cow Comfort yields more milk

Dairy contributes $1.2 billion to MN economy

- **Cow comfort affects health, milk production and profits**
- **Research/Extension on facilities, nutrition, manure management, and more**

Organic and Sustainable Farming

Organic is the fastest growing food segment

- Research and Extension answers emerging questions
- West Central Research and Outreach Center at Morris converting to organic dairy
- UM Crop varieties make Minnesota number one in organic soybean production (20% market share)
- Minnesota Institute for Sustainable Agriculture (MISA)

Keeping Our Food Safe

76 M US foodborne illnesses each year

- **325,000 hospitalizations**
- **5,000 deaths** (*Centers for Disease Control)*

University response:

- **Team of scientists working to prevent E. coli in foods**
- **Team of scientists experimenting with a water based electrochemical activation system to disinfect food.**
- **Extension Educational Programs train food workers throughout Minnesota**
- **National Center for Food Protection and Defense**

Building Leaders for Today and Tomorrow

- Minnesota Agriculture and Rural Leadership (MARL)
- Red River Valley Emerging Leaders
- Soil & Water Conservation District leadership programs
- U Lead Academy
- Horizons
- 4-H Youth Development

Next Generation of Scientists

Graduate fellowships from 2007 Ag State Special:

- Renewable energy
- Livestock production
- Agronomic crops
- Alternative and organic agriculture
- Extending Minnesota's growing season

Hiring New Extension and Research Faculty

- Renewable energy
- Agronomic crops
- Livestock Production
- Organic and alternative agriculture

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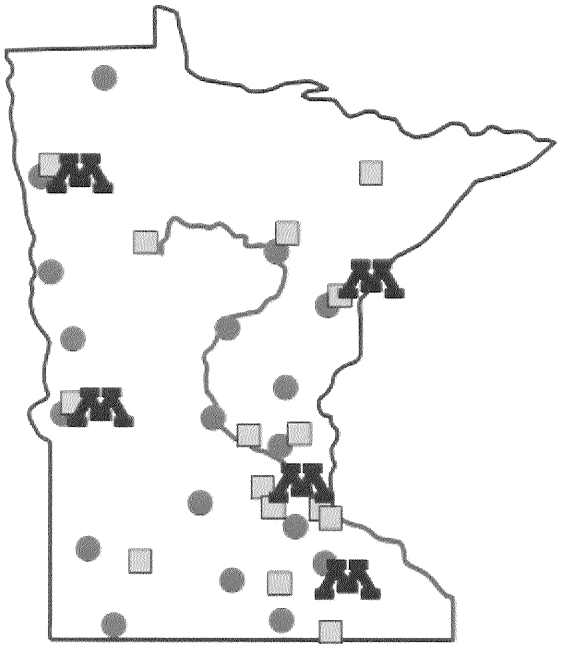
Rapid Agricultural Response Fund

- Bovine TB Research and Extension
- Biofuel byproducts
- Swine and turkey diseases
- Dairy housing
- Improving crop production

Minnesota Agriculture: Built on Partnerships



- Agricultural Organizations
- State, County and Federal
- Minnesota Legislature
- Producers

University of Minnesota Graduate Student Research funded through increased investment in 2007 Agriculture State Special

Educating graduate students multiplies the impact of faculty researchers while helping create the intellectual infrastructure to drive agriculture in the future. The fellowships listed below include those only made possible specifically by the increased investment in the 2007 Agricultural State Special. These fellowships are in addition to the approximately 500 University of Minnesota graduate students currently conducting research important to agriculture.

Renewable energy

- Thermochemical conversion of biomass to biofuels and biomaterials: Kevin Hennessy, PhD student, Department of Bioproducts and Biosystems Engineering.
- Producing renewable fuels, growing biomass crops and alternative bioenergy crops: Margaret Mangan, PhD student, Department of Agronomy and Plant Genetics.

Livestock production

- Determining the effect on embryo growth and development from altering the concentration of progesterone during the culture of in vitro produced (IVP) beef embryos: Jamie Larson, PhD student, Department of Animal Science.
- Increasing the understanding of swine, sheep and cattle diseases by using comparative genomics and functions of DNA editing enzymes: Rebecca LaRue, PhD student, College of Veterinary Medicine.
- Nutritional management of equine Polysaccharide Storage Myopathy (PSSM), a muscle disease in horses: Lisa Borgia, College of Veterinary Medicine.

Agronomic crops

- Proper management of nitrogen, phosphorous and other nutrients with precision agriculture: Michael Pinney, Department of Agronomy and Plant Genetics.
- Developing wheat and barley varieties resistant to Ug99, a virulent stem rust race that could arrive in Minnesota in future years. Chai Yun, Department of Plant Pathology.
- Economically and environmentally sound solutions for managing pyrethroid- resistant corn earworm in Minnesota sweet corn: Amy Morey, Department of Entomology.

Alternative and organic agriculture

- Improving the production and quality of organic vegetables and organic cropping systems: Adria Fernandez, Department of Agronomy and Plant Genetics.
- Alternative and pasture-based livestock options: Jolene Kelzer, Department of Animal Science.

Extending the Minnesota growing season

- Using high tunnels to extend growing season of crops such as greens interplanted with raspberries: Chris Pogliana, PhD student, Department of Horticultural Sciences

Other planned fellowships

- A graduate student being recruited will investigate antimicrobial, antioxidant and anti-inflammatory compounds from native and naturalized plants.
- A graduate student is being recruited to study the economics of organic agriculture and sustainable food systems.
- Three fellowships to be awarded will jumpstart the research programs of new faculty being recruited to join the College of Food, Agricultural and Natural Resource Sciences' faculty.

University of Minnesota Research and Extension positions funded through increased investment in 2007 Agriculture State Special

Renewable energy

- Extension Educator, renewable energy. A search is currently underway for a position focused on understanding energy markets and their linkages to agricultural commodity markets, energy policy alternatives, renewable energy technologies, community-based energy systems, and the role of renewable energy initiatives in addressing concerns about climate change.
- Assistant Professor Biocatalysis. A search has been launched for a faculty position with a research focus on the effective and sustainable conversion of bio-renewable resources and bio-based materials using biocatalysis. Bio-renewable resources include wood, agricultural crop residues and other lignocellulosic biomass.
- Assistant Professor Bioprocess Engineering. A search is currently underway for a faculty position with a research focus on the effective and sustainable conversion of bio-renewable resources and bio-based materials using bioprocesses.
- Extension Educator, biomass cropping systems. A search is currently underway for this position based at the West Central Research and Outreach Center, Morris

Agronomic crops

- Jeff Coulter, Assistant Professor, Extension agronomist. His research and Extension program focuses on helping corn producers increase productivity and profitability while protecting our natural resources.
- Robert Stupar, Assistant Professor, Legume Molecular Genetics. His research focuses on soybean molecular genetics and he also teaches a class in plant molecular biology and chromosome biology.

Livestock production

- Ryan Cox, Assistant Professor, Meat Science. His research and Extension program focuses on value-added animal product processing and food safety.
- Noah Litherland, Assistant Professor, Dairy Cattle Nutrition. His research and Extension work focuses on dairy cattle nutrition, dry period nutrition, lipid metabolism, dairy calf health and growth, use of by-products in ruminant diets, and regulation of feed intake.
- Krishona Martinson, Extension Equine Specialist. She is an expert in equine forage utilization and leads the Extension Horse Team in their efforts to increase the knowledge of horse owners and improve the quality of care of horses and their habitat in Minnesota.
- Beef Reproduction Extension and Research Faculty. A search is currently underway for this position based at the North Central Research and Outreach Center, Grand Rapids

Organic and alternative agriculture

- Rob King, Professor, Applied Economics. His research and extension work focuses on the economic aspects of growing and marketing organic and alternative food.
- Wayne Martin, Associate Director, Alternative Livestock Systems Program. His work focuses on providing research-based advice to farmers growing small ruminants (sheep and goats) and alternative swine.
- Organic Dairy Extension and Research Faculty. A search is planned underway for this position based at the West Central Research and Outreach Center, Morris
- Organic Cropping Extension and Research. A search is planned for this position based at the Southwest Research and Outreach Center, Lamberton.
- Extension educator, small farms. A search is currently underway for an Extension educator to provide research-based information about business, marketing and production on small farms.