Minnesota's Bioscience Industry

A FACT SHEET FOR BUSINESSES

Agricultural and Industrial Biotechnology:

Minnesota is well positioned with abundant agricultural resources and top industrial biotechnology firms.

- Minnesota's Agricultural and Industrial Biotechnology industries supply a diverse range of products that include:
  - ➤ Agricultural chemicals **(Cargill Inc., Cenex Harvest States)**
  - ➤ Specialty cleaning and sanitation preparations **(Ecolab)**
  - ➤ Sanitary products **(H.B. Fuller)**
  - ➤ Prepared feed and feed ingredients **(Land O'Lakes Agricultural Services, Archer Daniels Midland, Cargill Inc.)**
  - ➤ Crop services **(Land O'Lakes Agricultural Services, Syngenta Seeds, Cenex Harvest States)**
  - ➤ Biofuels **(Cargill Dow LLC, Minnesota Corn Producers – ADM)**
  - ➤ Biopesticides **(Syngenta)**
  - ➤ Soybean processing **(ADM, Cenex Harvest States, Ag Processing Inc.)**
  - ➤ Plant biopolymers/fibers **(Cargill Dow)**
  - ➤ Industrial lubricants **(Cargill Inc.)**

Top Agricultural and Industrial Biotechnology Companies in Minnesota

Company	Annual Sales* (millions)
Cargill	$59,894
Cenex Harvest States Oilseed Processing	4,500
Ecolab	3,404
Land O'Lakes Agricultural Services	2,853
H. B. Fuller	1,256

* Sales for Minnesota headquarters or Minnesota-based operations
Source: Corporate Report Factbook 2003
Dun & Bradstreet, company annual reports.

- In Minnesota there are:
  - ➤ About 1,300 agricultural and food scientists and technicians, and 2,500 chemist and chemical technicians.
  - ➤ About 375 chemistry and more than 200 chemical engineering degrees were awarded in Minnesota in 2000.
- Minneapolis-St. Paul is considered the fifth most knowledge competitive region in the world, according Robert Huggins Associates, a British research firm. Rankings take into account indicators such as the number of IT, biotechnology and engineering employees per 1,000 inhabitants, and the number of patents registered per million people.
- According to research done at the University of Minnesota in 2003, Minnesota farmers are producing **engineered seed crops** valued at $2.2 billion annually.
- Examples of **seed research** include wheat and potato fungal resistance at the University of Minnesota and sugar beet herbicide tolerance at BetaSeed of Shakopee, Minnesota.
- **Cargill Dow LLC** manufactures biodegradable packaging and fibers using corn starch and a special fermentation process that requires 20 to 50 percent less fossil resources. CEO Randy Howard was named to the 2002 *Scientific American* 50, a list of visionary contributors to science and technology.
- **Minnesota Corn Processors** is the second largest domestic producer of ethanol, and merged with Archer Daniels Midland in 2002.
- **Land O'Lakes** provides farmers with:
  - ➤ Genetically engineered seeds through its seed company **Croplan Genetics** that produce higher yields through crop inputs and agricultural services.
  - ➤ Specialty corn products for animal feeds and consumer food markets developed in conjunction with **Novartis Seeds**.
- Using a solvent process, **Cenex Harvest States** manufactures soy products including edible refined oil, ink, flour, soy meal, fatty acids and lecithin. In 2003, Cenex Harvest States opened its second soybean crushing facility in Fairmont, Minnesota.
- **Ecolab** operates in 40 countries worldwide and manufactures products such as cleaners and hand sanitizers.
- **H.B. Fuller** has developed water-based adhesives and non-woven hygienic technology used in the fabrication of diapers, adult incontinence devices, feminine and disposable medical products.
- In 2003, **Minnesota Soybean Processors** built a new soybean processing plant in Brewster, Minnesota and announced the addition of a biodiesel refinery.
- A project of Positively Minnesota, the Department of Agriculture and the University of Minnesota's Department of Wood and Paper Science, the **Minnesota Biofiber Consortium** brings together leaders of industry, research and agriculture to promote agricultural crops and residues as industrial feedstocks.

University of Minnesota: *Exceptional Chemistry, Agricultural and Veterinary Studies*	➤ The University's **College of Agricultural, Food and Environmental Science**, one of the top five colleges of agriculture in the world, enhances agricultural systems through plant genetics and biocontrol of weeds. ➤ Studies at the University's Colleges of **Veterinary Medicine and Molecular Veterinary Bioscience**, include genomics, molecular biology, and comparative medicine. ➤ The **Chemical Engineering** program is ranked number one by the National Research Council and each year confers about 210 graduate and undergraduate degrees. ➤ The $20 million **Cargill Building for Microbial and Plant Genomics** provides a hub for 175 researchers in the genomics of microbes and crop plants. The building opened in 2003.