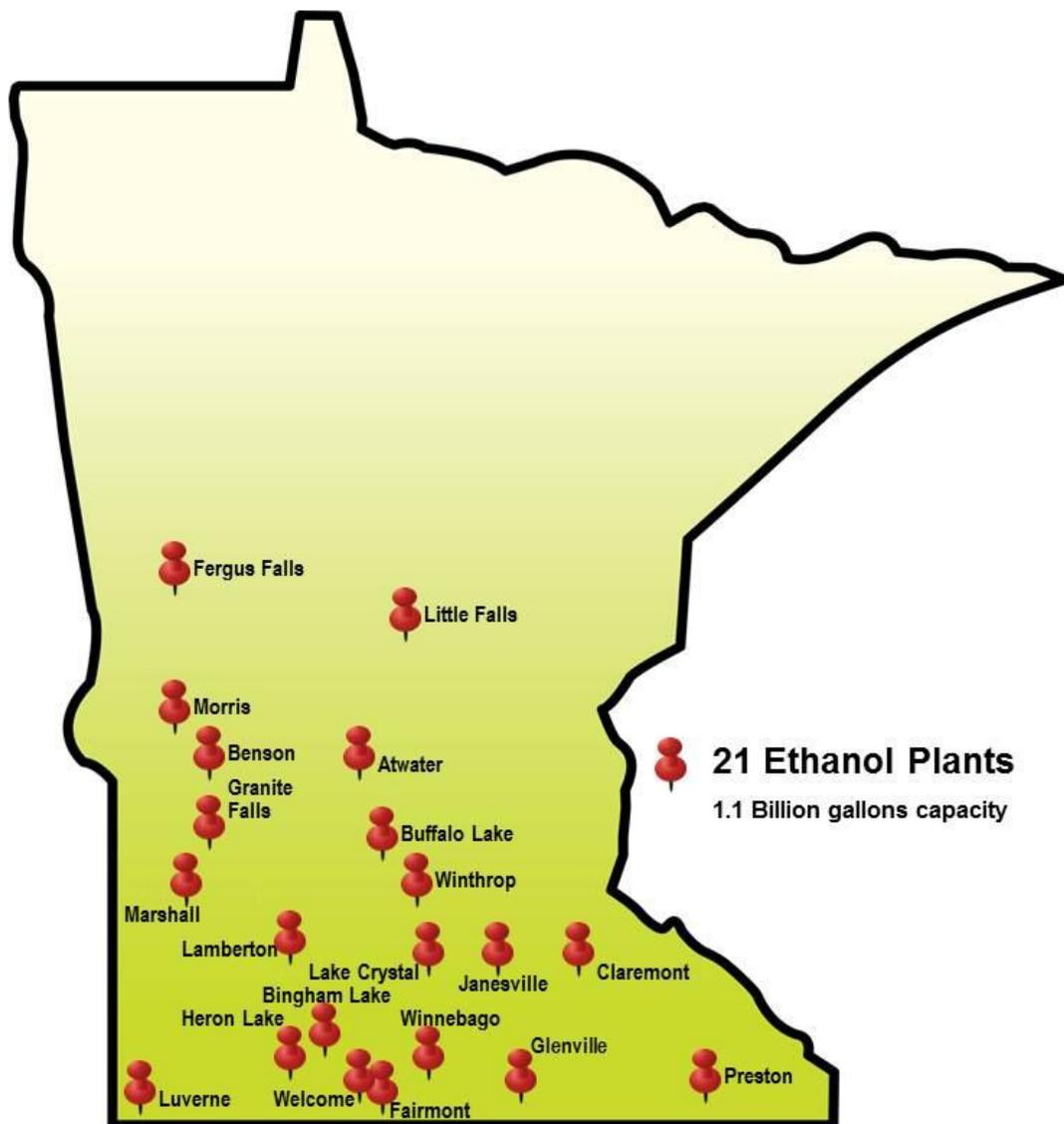


Minnesota Ethanol Industry

Ethanol Plants in Minnesota

2012



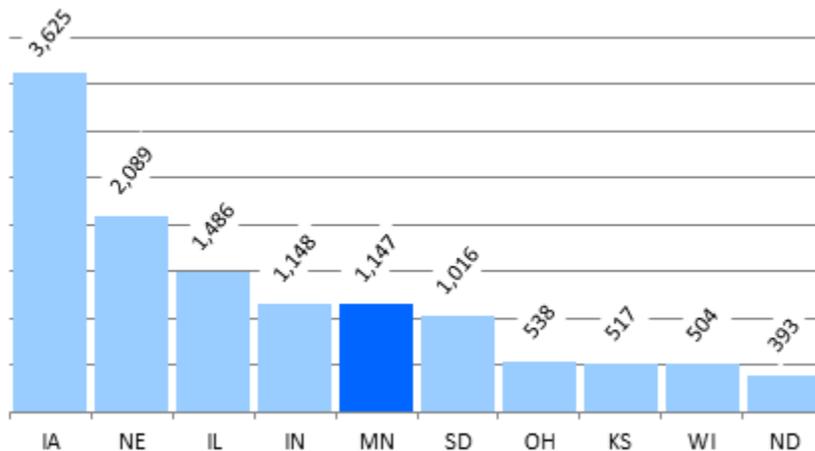
www.mda.state.mn.us/renewable

Minnesota Ethanol Industry

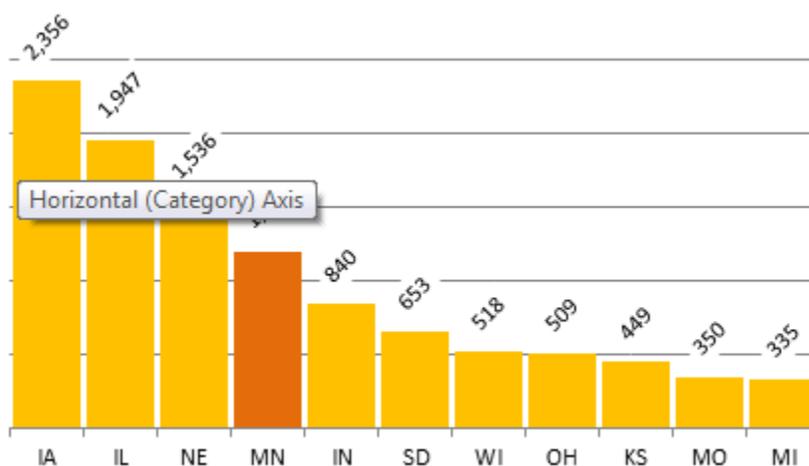
Minnesota Ethanol Industry Overview

- Minnesota ranks No. 5 in the nation in ethanol production.
- The Minnesota ethanol industry adds value to the state's largest agricultural crop – corn – by processing it into feed and fuel rather than it being sold just as a raw commodity.
- In 2011, ethanol added \$912 million to the value of corn, a second record high. For every bushel of corn processed into ethanol, \$2.07 was generated in additional revenue.
- The Minnesota ethanol industry's return on investment (ROI) from 1990 to 2011 was 813%. For every dollar invested in building the ethanol plants, more than eight dollars were generated for the state economy.
- Minnesota's ethanol industry has 21 plants and over 11,000 corn farmers who supply it with feedstock. Were it organized or combined as one corporation, it would rank No. 5 among the largest manufacturing companies in the state.

Minnesota Ethanol Production: National Ranking (Million gallons)



Minnesota Corn Production: National Ranking (Million bushels)



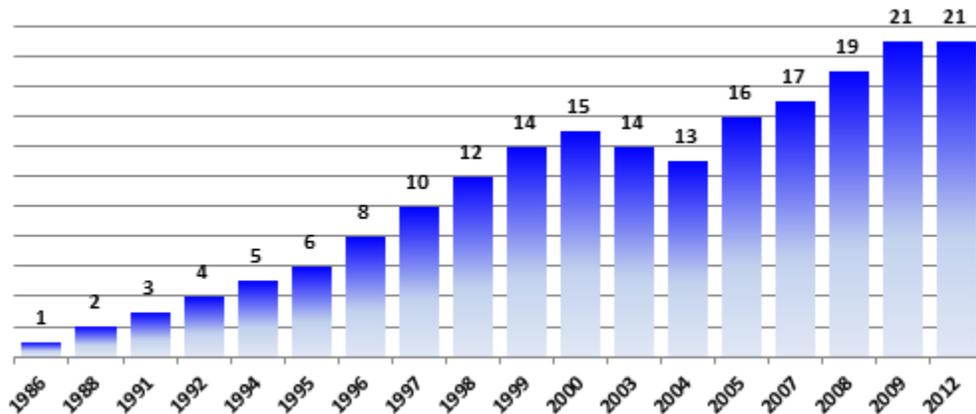
Source: MDA, USDA, RFA

Minnesota Ethanol Industry

Minnesota Ethanol Plants

- Minnesota has 21 ethanol plants with a total annual production capacity of 1.1 billion gallons.
- Ten of the 21 ethanol plants are farmer-owned co-operatives, bringing direct economic returns to farmers and rural communities.
- Among the ethanol plants, the annual production capacity ranges from 22 to 110 million gallons per plant, or 8 to 40 million bushels of corn processed.

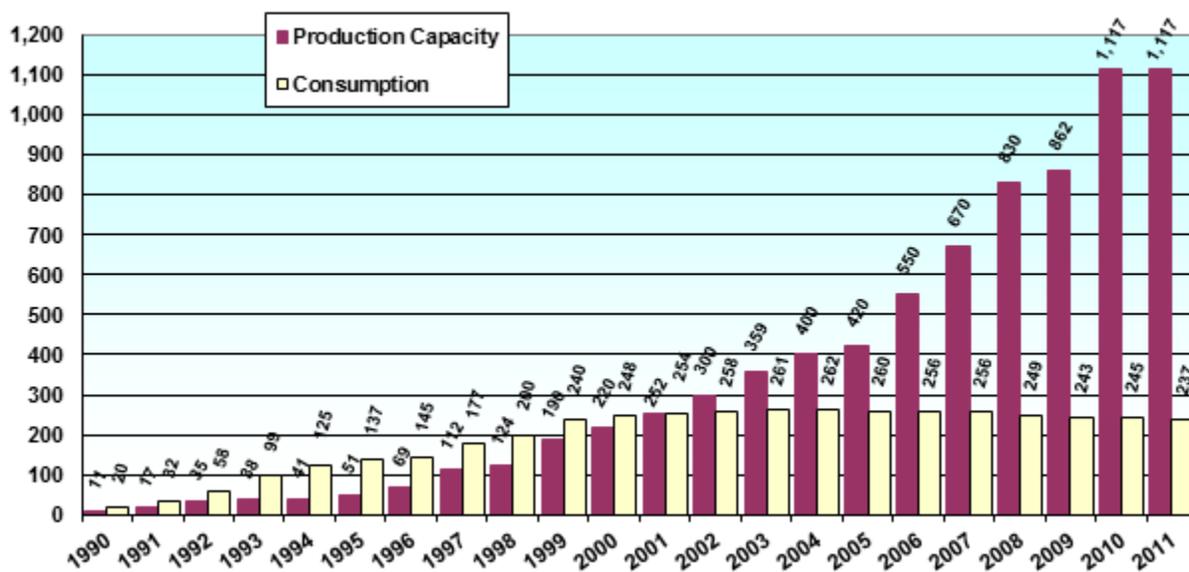
Minnesota Ethanol Plants (Number of Plants)



Minnesota Ethanol Production and Consumption

- The 2011 Minnesota ethanol production capacity was 1.1 billion gallons, while the ethanol consumption was 237 million gallons.
- Ethanol consumption in Minnesota accounted for 21% of the total ethanol production.
- The state's net ethanol exports were 880 million gallons or 79% of the production.

Minnesota Ethanol Production and Consumption (Million Gallons)



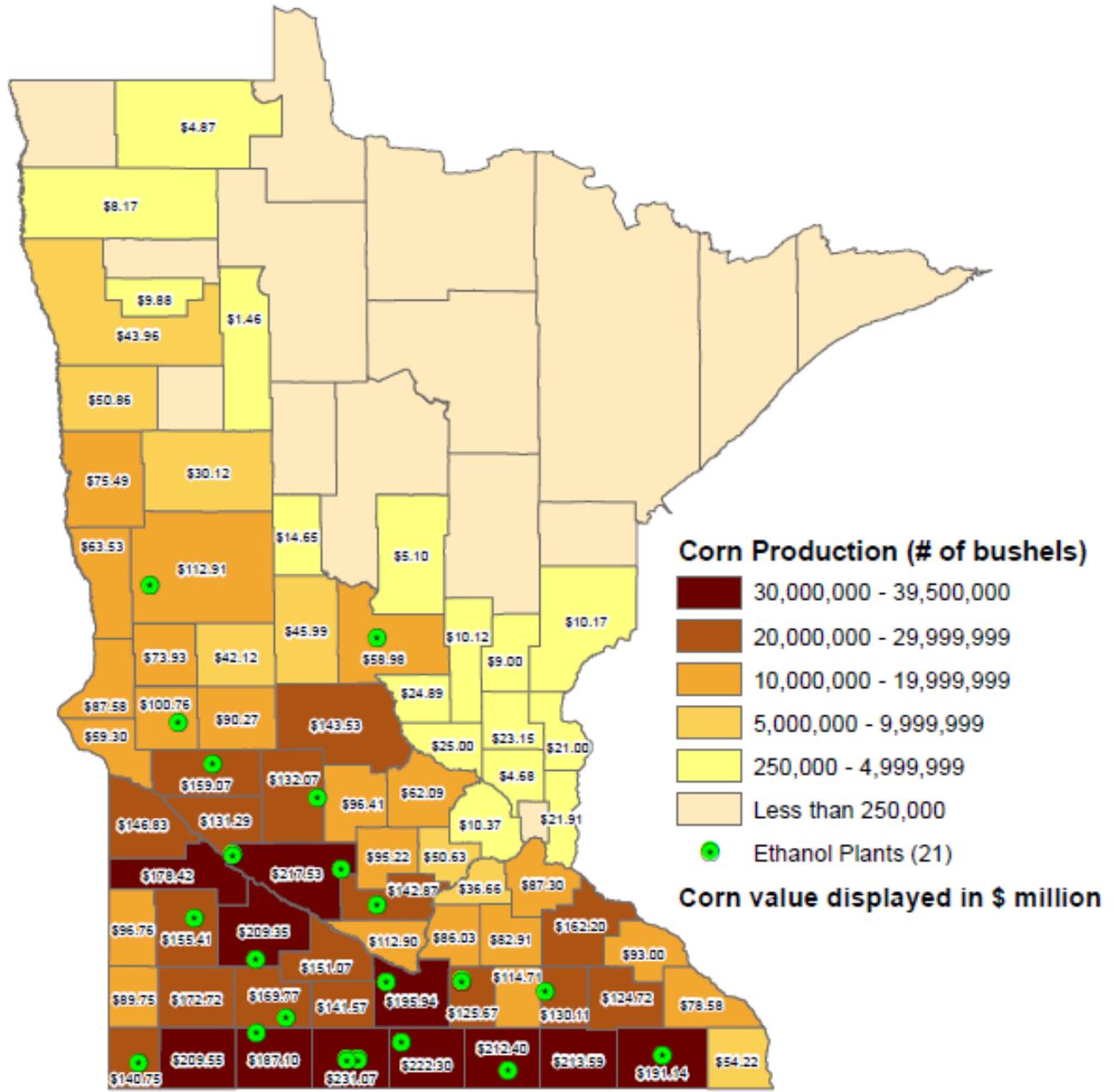
Source: MDA

Minnesota Ethanol Industry

Minnesota Corn Production

- In 2011, Minnesota farmers harvested more than 1.2 billion bushels of corn with a value of over \$7 billion.
- There are more than 11,000 Minnesota corn farmers who grow and supply corn for the ethanol industry.

2011 Minnesota Corn Production by County and Ethanol Plants Location



Source: USDA, MDA

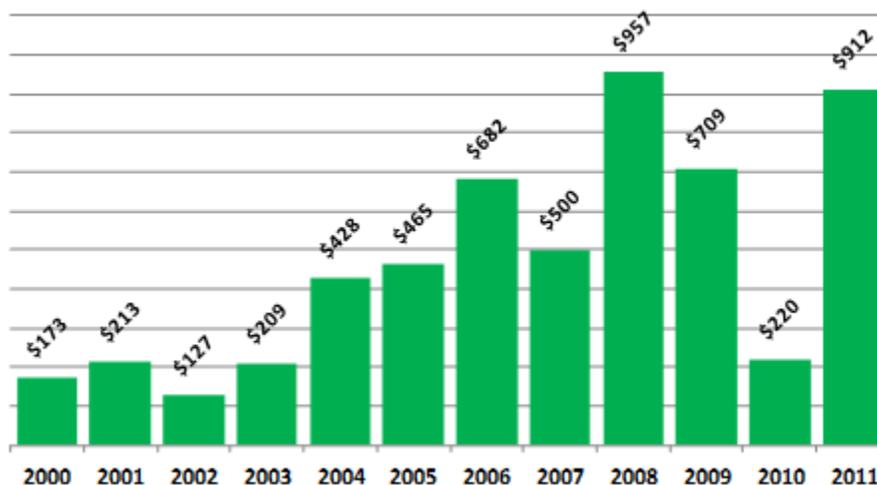
Minnesota Ethanol Industry

Ethanol Production Adds Value to Minnesota Corn

- In 2000, Minnesota's ethanol industry added a total of \$173 million to the state's corn crop, averaging \$2.13/bushel for corn processed into ethanol.
- A record high \$957 million in total value-added was reached in 2008, or an average of \$2.73/bushel.
- From 2000 to 2011, the average value-added per bushel was \$2.10, validating the ethanol industry's critical role in bringing increased returns to the state's largest agricultural crop.

Year	Corn Use for Ethanol & DDG Production (Million bu.)	Value of Corn – Raw Commodity (Million dollars)	Value of Corn – Processed into Ethanol & Co-products (Million dollars)	Added Value (\$/bu.)	Total Value-added Due to Ethanol Production (Million dollars)
2000	81.48	\$139.33	\$312.79	\$2.13	\$173.45
2001	93.33	\$177.33	\$390.63	\$2.29	\$213.30
2002	111.11	\$238.89	\$365.85	\$1.14	\$126.96
2003	132.96	\$312.46	\$521.48	\$1.57	\$209.02
2004	148.15	\$287.41	\$715.29	\$2.89	\$427.89
2005	155.56	\$289.33	\$754.47	\$2.99	\$465.14
2006	187.00	\$540.43	\$1,222.29	\$3.65	\$681.86
2007	301.00	\$1,243.13	\$1,742.74	\$1.66	\$499.61
2008	350.00	\$1,372.00	\$2,328.56	\$2.73	\$956.56
2009	436.00	\$1,512.92	\$2,221.71	\$1.63	\$708.79
2010	451.00	\$2,259.51	\$2,479.35	\$0.49	\$219.84
2011	440.00	\$2,574.00	\$3,486.35	\$2.07	\$912.35
Average				\$2.10	\$466.23

Minnesota Ethanol: Value-Added to Corn Crop (Million dollars)



Source: MDA, USDA, PRX

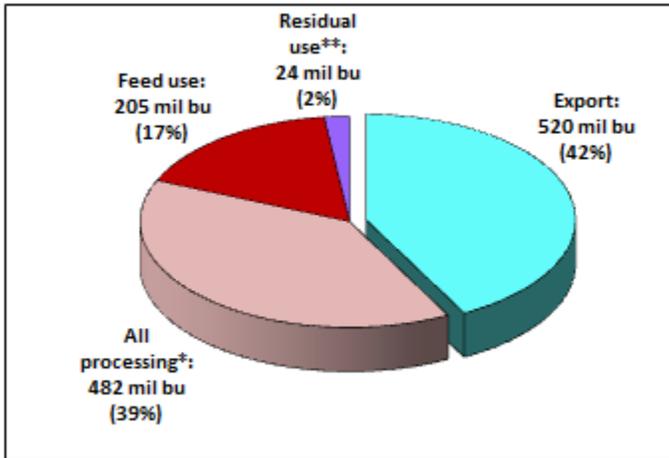
Minnesota Ethanol Industry

Minnesota Corn Utilization

- In 2011, Minnesota's corn exports took the largest share of the state's corn crop, at 42%, followed by corn processing (39%) and feed use (17%).
- By comparison, Iowa, the largest corn processing state, exported 17% of its corn crop, processed 68%, and fed 13% to livestock.

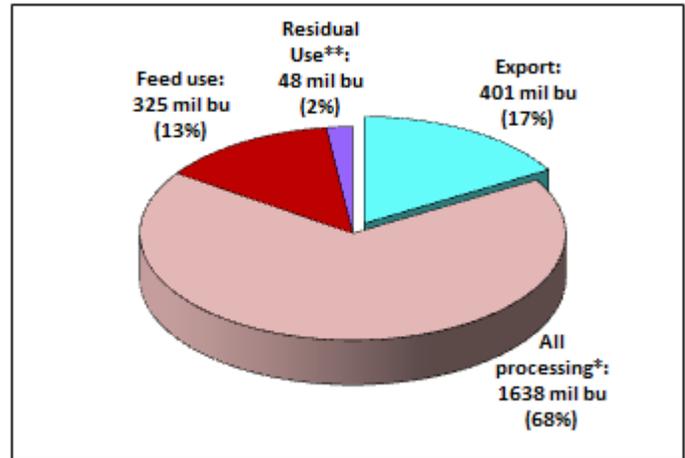
Minnesota Corn Utilization (2011)

Corn production: 1.2 billion bushels



Iowa Corn Utilization (2011)

Corn production: 2.4 billion bushels



*All processing – including both ethanol and other corn processing. **Residual use – all other uses. Source: PRX

Ethanol's Co-product: DDG Replacing Corn as Feed

- Minnesota is the 3rd largest DDG producer in the U.S., with 2.95 million metric tons produced in 2011.
- Minnesota's DDG displaced 60 million bushels of corn in the state's feed supply, or about 30% of Minnesota's total feed use, in 2011.
- In the U.S., DDG displaced 1.2 billion bushels of corn in domestic feed rations in 2011.

MN Corn Displaced by DDG

Year	Million Bushels	% Added to Corn Feed Use
2002	46	20%
2003	45	19%
2004	41	18%
2005	43	19%
2006	30	14%
2007	49	24%
2008	45	22%
2009	52	25%
2010	60	29%
2011	60	29%

U.S. Corn Displaced by DDG

Year	Million Bushels	% Added to Corn Feed Use
2002	189	4%
2003	253	5%
2004	329	7%
2005	342	7%
2006	569	11%
2007	914	19%
2008	927	21%
2009	1,086	25%
2010	1,212	28%
2011	1,203	27%

Source: PRX & MDA

Minnesota Ethanol Industry

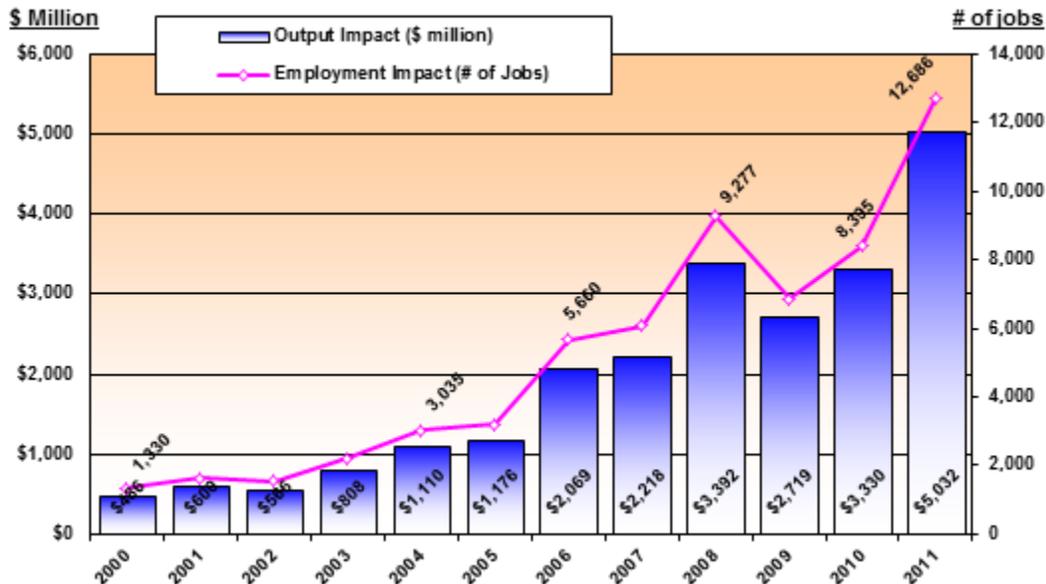
Economic Impact

- Minnesota’s ethanol industry has a “multiplier effect” that benefits many economic sectors across the state, including agriculture, manufacturing, transportation, services, construction, and trade.
- At the 1.1 billion-gallon production level in 2011, Minnesota’s ethanol industry generated an estimated \$5 billion in total economic output and more than 12,600 jobs.
- From 2000 to 2011, Minnesota ethanol production grew by 439%, while the total output impact grew by 935% and the employment impact grew by 854%.

Minnesota Ethanol Production and Economic Impact

Year	Production (Million Gallons)	Output Impact (\$ million)	Employment Impact (# of Jobs)
2000	204	\$486.12	1,330
2001	233	\$600.32	1,642
2002	278	\$566.17	1,549
2003	332	\$807.73	2,209
2004	370	\$1,109.76	3,035
2005	389	\$1,175.73	3,214
2006	468	\$2,069.29	5,660
2007	753	\$2,217.84	6,066
2008	875	\$3,391.90	9,277
2009	1,090	\$2,718.80	6,854
2010	1,128	\$3,330.04	8,395
2011	1,100	\$5,031.86	12,686
2000-2011 growth	439%	935%	854%

Minnesota Ethanol: Output Impact & Employment Impact



Source: MDA

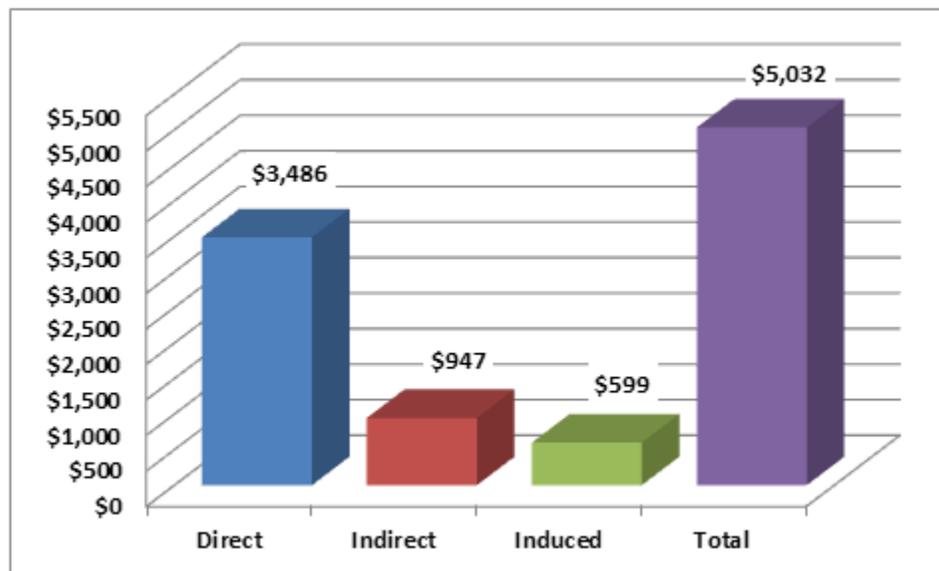
Minnesota Ethanol Industry

Economic Impacts: Direct, Indirect, Induced, and Total

- The economic impacts are measured to include the direct, indirect, and induced impacts.
 - **Direct impact** represents the effect of the ethanol industry's production output.
 - **Indirect Impact** represents the effect on all other economic sectors due to purchases by the ethanol industry to generate the above-mentioned production output.
 - **Induced impact** represents the effect on all economic sectors due to the expenditures of new income generated by the direct and indirect impacts.
 - **Total impact** is the sum of direct, indirect and induced impacts.

Minnesota Ethanol Industry Economic Impact

(Output – Million dollars)



Source: MDA



Prepared by: Su Ye
Program Director of Market Research
Minnesota Department of Agriculture
625 Robert Street North, St. Paul, MN 55155
www.mda.state.mn.us
(2012)