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Tight Supply and Strong Demand May Raise U.S. Nitrogen Fertilizer Prices

Nitrogen accounted for 56.6 percent of the 21.3 million tons of chemical fertilizer nutrients (nitrogen, phosphate, and potash) used by U.S. agriculture in 2006. The composite fertilizer price increased 113 percent between 2000 and 2007, led by gains in nitrogen prices. During this 7-year period, the price of ammonia, the main source of nitrogen in fertilizer production, increased 130 percent from $227 to $523 per ton. The price of urea, the primary solid nitrogen fertilizer used in the U.S., rose 127 percent from $200 to $453 per ton.

Increased nitrogen prices affect all crop producers, but especially corn and wheat growers, for whom nitrogen costs are the largest single operating expense. Nitrogen applications accounted for 18 percent of the operating costs for corn producers and about 30 percent for wheat producers. Total nitrogen costs for U.S. corn production were $2.98 billion in 2005 and $0.9 billion for wheat in 2004.

Corn accounted for the largest share of nitrogen use among all crops. Planted acres of corn were relatively unchanged from 2000 through 2006, but jumped 19 percent from 78 million acres in 2006 to 93 million acres in 2007. Expanded planting of corn acres is due to high corn prices, driven by growing ethanol demand and strong export sales. Farmers are expected to apply an additional 1 million nutrient tons of nitrogen to the 2007 corn crop. Furthermore, increasing world demand for nitrogen is expected to continue in the near term. Overall, global nitrogen demand grew 14 percent from 2000 to 2006. Greater nitrogen demand from other countries could make U.S. imports of nitrogen fertilizers more costly.

At the same time, the U.S. supply of ammonia for nitrogen fertilizers has been declining. Because natural gas is the primary raw material used to produce ammonia, the volatile and upward trend in U.S. natural gas prices led to a 35-percent decline in U.S. ammonia production capacity and a 44-percent decrease in output between 2000 and 2006. Meanwhile, U.S. ammonia imports increased 115 percent. The share of U.S.-produced ammonia in the U.S. aggregate supply dropped from 80 to 55 percent, while the import share increased from 15 to 42 percent. The annual U.S. aggregate ammonia supply declined 17 percent, while the inventory level dropped 71 percent.

Further expansion of ethanol production and continued strong export sales of corn could boost U.S. demand for nitrogen fertilizers. Further increases in natural gas prices may limit U.S. production capacity to produce ammonia. The additional supply of nitrogen needed to meet the increasing demand may have to come from imports and thus make U.S. crop producers more vulnerable to changes in global nitrogen and natural gas markets.

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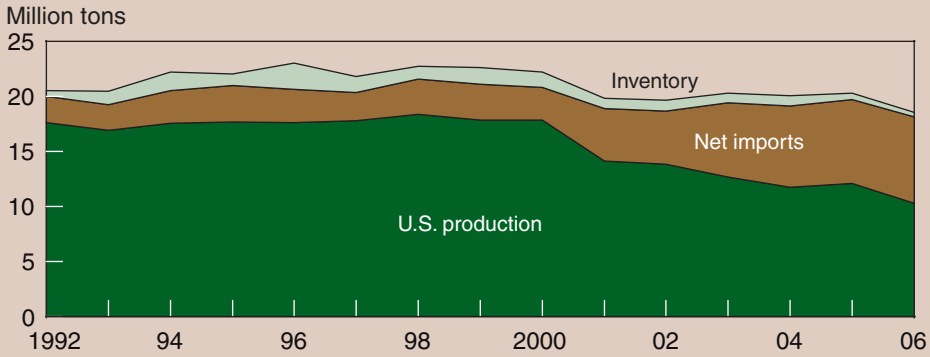
This finding is drawn from . . .

Impact of Rising Natural Gas Prices on U.S. Ammonia Supply, by Wen-yuan Huang, WRS-0702, USDA, Economic Research Service, August 2007, available at: www.ers.usda.gov/publications/wrs0702/

U.S. ammonia supply more dependent on imports since 2000



Note: Fertilizer year starts from July of the preceding year to June of the year indicated in the chart.

Source: USDA, Economic Research Service, using production and inventory data from the U.S. Department of Commerce and The Fertilizer Institute, and net import data from ERS.