

# Growing Your Bottom Line

By Michael Salassi, PhD.  
LSU AgCenter



## Economic Aspects of Nitrogen Fertilization

**N**itrogen is a major plant nutrient necessary for optimal sugarcane production in Louisiana. Given the recent dramatic rise in the price of nitrogen fertilizer, it is also a major component of sugarcane production cost. With its significant impact on farm income, through its influence on sugarcane yields, and its impact on farm production costs, the economically efficient use of nitrogen fertilizer is a critical factor in maximizing sugarcane farm net returns. This article briefly highlights some current economic aspects of nitrogen fertilization including use, timing, cost and price volatility.

As have been discussed at recent grower meetings this year, recommended nitrogen fertilization rates for sugarcane production in Louisiana have been reduced. Current recommendations call for 60-100 lbs. of nitrogen on plant cane (60-80 lbs. on light soils and 80-100 lbs. on heavy soils) and 80-120 lbs. on stubble cane (80-100 lbs. on light soils and 100-120 lbs. on heavy soils). These rates are based on research conducted to determine the optimal fertilization rate to maximize sugar per acre.

Since farm income is ultimately based on sales of raw sugar, optimal nitrogen fertilization should be based on maximizing sugar, not cane, production per acre. Increased nitrogen application rates above recommended levels may increase tons of cane per acre, but also decreases sugar per ton. The economic implication of higher than recommended nitrogen application rates is higher fertilization costs per acre in return for an equal or reduced sugar income per acre, thereby reducing net farm returns to the grower.

To maximize dollar of return per dollar invested in nitrogen fertilization, timing of nitrogen application is also very important. Research has shown that optimal nitrogen utilization for sugarcane in Louisiana occurs when it is applied between April 1 and April 30. Nitrogen fertilizer applications prior to April 1 can result in nutrient loss due to leaching and denitrification. Recent research has indicated that nitrogen applications can be made as late as the first part of May with no major impacts on sugar yield. The point here is to apply nitrogen when the sugarcane

plant can most efficiently utilize it. This is true both from an agronomic as well as an economic perspective.

In terms of fertilizer cost, the USDA prices paid index for nitrogen fertilizer in February was down 16.7% from January and 13.6% below prices a year ago. In Louisiana, projected fertilizer prices in January were \$0.53 per pound of nitrogen. Current (March) price quotes for nitrogen fertilizers are in the \$0.55 per pound of nitrogen range. At these prices, projected nitrogen costs for the 2009 sugarcane crop would be in the \$33 to \$55 per acre range for plant cane and in the \$44 to \$66 per acre range for stubble cane.

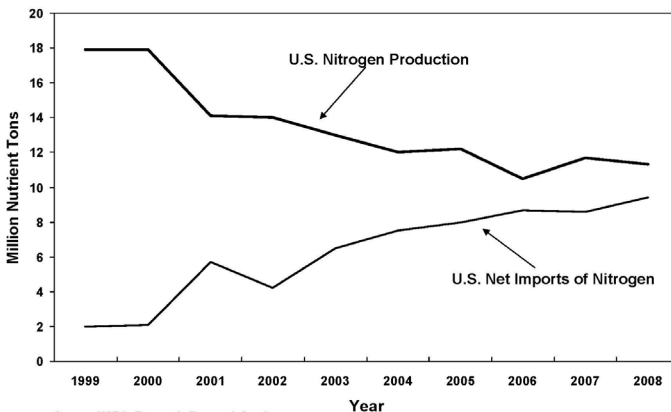
During 2007 and 2008, prices of nitrogen and other fertilizers increased dramatically, before tailing off slightly at the end of 2008. This price volatility is the result of several factors which are affecting both the supply and demand of nitrogen fertilizer in the United States.

As illustrated in the chart below, approximately half of U.S. nitrogen fertilizer is now imported from foreign countries. As a commodity traded in the world market, many factors can have an influence on nitrogen fertilizer prices. Factors which have had a significant impact

on prices over the past year include (1) the rising cost of natural gas, which increases the cost of producing ammonia used to make nitrogen fertilizer, (2) increased overseas transportation costs, which increases the cost of imported fertilizer, (3) the falling U.S. dollar, which makes imported fertilizer more expensive, (4) increasing global population, which increases the world demand for fertilizer, and (5) foreign trade policies, which might limit fertilizer exports to the U.S. to ensure adequate domestic supplies in foreign countries of production.

Fertilizer prices in 2009 are expected to hold at current levels, or rise slightly, in response to reduced supplies, increased demand and lags in supply availability. Over the long run, nitrogen fertilizer prices will still be correlated closely with energy prices. There is optimism, however, for the prospect of increased domestic nitrogen fertilizer production in the U.S. Recent advances in using coal to produce ammonia (through coal gasification) are improving the economic feasibility of this technology. The U.S. has the world's largest coal reserve. Domestic production of ammonia based on coal could play a larger role in U.S. nitrogen supply, potentially lowering and stabilizing the price of nitrogen fertilizer in the years to come.

U.S. Nitrogen Fertilizer Production and Imports, 1999-2008



Source: USDA, Economic Research Service.