NITROGEN

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In 2003, U.S. ammonia production was 8.77 million metric tons (Mt) of contained nitrogen, about a 14% decrease from production in 2002. Spikes in natural gas prices early in the year and reduced demand in the late summer led to the production decrease. Apparent consumption, however, declined only by about 2% from 2002. A significant increase in imports of ammonia helped to make up for the fall in domestic production. Imports of ammonia jumped by 22% from those in 2002, with most of the imports in 2003 coming from Canada, Russia, and Trinidad and Tobago. About 89% of the domestically produced ammonia consumed in the United States was used in fertilizer applications. Global ammonia production in 2003 of 109 Mt of contained nitrogen was about the same as that in 2002. China, India, Russia, and the United States were the leading producers, together accounting for about 53% of the total.

Legislation and Government Programs

Final determinations on imports of urea ammonium nitrate (UAN) solutions from Belarus, Russia, and Ukraine were announced in February and March. For Belarus and Ukraine, the U.S. Department of Commerce's (DOC) International Trade Administration (ITA) determined that UAN from these countries was likely to be sold at less than fair value. The antidumping duty established for Belarus was 226.82% ad valorem, and the duty for Ukraine was 193.57% ad valorem for the period from October 1, 2001, to March 31, 2002 (U.S. Department of Commerce, International Trade Administration, 2003a, b). For Russia, the ITA agreed to suspend the antidumping investigation. The basis for this action was a suspension agreement between the DOC and Russian firms JSC Nevinnomysskij Azot, JSC Kuybyshevazot/Togliatti, and S.P. Novolon/Novomoskovsk, which together accounted for substantially all imports of UAN from Russia. In the agreement, these companies agreed to stop exporting UAN from Russia until July 1, 2003, and after that, to revise prices to ensure that UAN is being sold at or above an agreed reference price. In addition, a quarterly maximum import level for UAN was established through 2007 (U.S. Department of Commerce, International Trade Administration, 2003d). Contrary to the ITA's finding, the U.S. International Trade Commission (ITC) subsequently determined that the United States was neither materially injured nor threatened by imports of UAN from Belarus, Russia, and Ukraine, so no antidumping duties were established, and the suspension agreement between the ITA and the Russian companies was terminated (U.S. Department of Commerce, International Trade Administration, 2003c; U.S. International Trade Commission, 2003). On June 13, the Nitrogen Solutions Fair Trade Committee, a group of U.S. UAN producers, filed a complaint in the U.S. Court of International Trade appealing the ITC's ruling. At yearend, no determination had been made (Green Markets, 2003m).

Responding to congressional concerns about the effects of high natural gas prices on U.S. nitrogen fertilizer producers and farmers, the U.S. General Accounting Office (GAO) undertook a study to determine the effects of natural gas prices on production and availability of nitrogen fertilizer and the role of the Federal Government in mitigating the impact of natural gas prices on the U.S. fertilizer market. The GAO concluded that although higher natural gas prices have contributed to higher nitrogen fertilizer prices, supplies generally have been adequate during periods of high natural gas prices because of increased imports, and that the Federal Government has a limited role in managing the effects of natural gas prices on the fertilizer market. Ammonia production in the United States generally consumes about 3% of the natural gas produced each year (U.S. General Accounting Office, 2003§[1]).

The United States granted market-economy status to Bulgaria, Estonia, Lithuania, and Romania in 2003. The change from nonmarket-economy status to market-economy status means that, in any future antidumping investigations, costs from these countries would be used in the determination rather than costs from similar surrogate countries as has been done in the past. Estonia, Lithuania, and Romania have been subject to antidumping duties on imports of solid urea into the United States since 1987.

Several free-trade agreements were signed by the President in 2003. On September 3, the President signed the United States-Chile Free Trade Agreement. Under terms of the agreement, more than three-quarters of U.S. farm goods by value exported to Chile will be duty free within 4 years of the agreement's implementation. Tariffs on other products will be phased out during the course of 8, 10, or 12 years. All the commodities in the 4-, 8-, and 10-year baskets will have their duties reduced in equal increments to zero during the transition period. The agreement handles other agricultural products in a number of ways, such as tariff-rate quotas, an agricultural safeguard provision, and 12-year nonlinear and linear phaseout periods (U.S. Department of Agriculture, 2003§). On May 6, the President signed the United States-Singapore Free Trade Agreement. At yearend, negotiations continued on the Central American Free Trade Agreement, which is a comprehensive trade agreement between Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the United States; the United States-Morocco Free Trade Agreement; and the United States-Australia Free Trade Agreement.

[1]References that include a section mark (§) are found in the Internet References Cited section.

Production

Industry statistics for anhydrous ammonia and derivative products were developed by the U.S. Census Bureau. A summary of the production of principal inorganic fertilizers by quarter was reported in the series MQ325B, and industrial gases (including nitrogen) were reported in the quarterly report MQ325C. In 2003, production of anhydrous ammonia (82.2% nitrogen) fell by 14% to 8.77 Mt of contained nitrogen compared with a revised figure of 10.1 Mt in 2002 (table 1). Of the total production, 89% was for use as a fertilizer; the remaining 11% was used in other chemical and industrial sectors (table 2).

The United States remained the world's second largest producer and consumer of elemental and fixed types of nitrogen following China. In declining order, urea, ammonium phosphates [diammonium phosphate (DAP), monoammonium phosphate (MAP), and other ammonium phosphates], ammonium nitrate, nitric acid, and ammonium sulfate were the major downstream products produced from ammonia in the United States. Their combined production was 9.12 Mt of contained nitrogen, with urea accounting for about 31% of the production (table 3). Of the urea produced in the United States in 2003, 44% was consumed in granular form, 37% was used for UAN production, 16% was consumed in prill form, and 3% was consumed in feedstock for other uses, such as melamine production.

Ammonia producers in the United States operated only at about 56% of design capacity; this percentage included capacities at plants that operated during any part of 2003. Of the plants that operated in 2003, almost 54% of total U.S. ammonia production capacity was concentrated in the States of Louisiana (32%), Oklahoma (15%), and Texas (7%), owing to large reserves of feedstock natural gas. Koch Nitrogen Co., Terra Industries Inc., PCS Nitrogen Inc., CF Industries Inc., Agrium Inc., and Mississippi Chemical Corp., in descending order, accounted for 82% of total U.S. ammonia capacity (table 4).

A sharp increase in natural gas prices in the beginning of 2003 resulted in the temporary closure of a significant portion of U.S. nitrogen production capacity. By the end of February, when the Henry Hub spot natural gas price had risen briefly to more than $18 per million British thermal units, about two-thirds of the U.S. ammonia production capacity was idled. By mid-March, the natural gas price had fallen to less than $6 per million British thermal units, and by the end of the month, some of the idled capacity had come back onstream. In June and July, more than 20% of the U.S. ammonia production capacity was idled again, responding to a seasonal drop in demand and increasing natural gas prices; natural gas prices were more than $6 per million British thermal units. Much of this capacity was brought back onstream in October as natural gas prices decreased and approached $4 per million British thermal units.

In March, Koch Nitrogen acquired most of Farmland Industries Inc.'s nitrogen assets in a bankruptcy auction. Koch Nitrogen acquired plants in Beatrice, NE, Dodge City, KS, Enid, OK, and Ft. Dodge, IA, with a total ammonia production capacity of 1.8 million metric tons per year (Mt/yr). Adding this to its 1.1-Mt/yr Sterlington, LA, ammonia plant brought Koch Nitrogen's total U.S. capacity to 2.9 Mt/yr, or 19% of total U.S. yearend 2003 capacity. This made Koch Nitrogen the largest U.S. ammonia producer. In addition to the plants in the United States, Koch Nitrogen acquired Farmland's 50% ownership of the Farmland-Mississippi Chemical joint-venture ammonia plant in Trinidad and Tobago. Farmland's 350,000-metric-ton-per-year (t/yr) Coffeyville, KS, petroleum-coke-to-ammonia plant was not included in the sale. According to press reports, Koch Nitrogen paid $171 million for the United States assets and $122 million for the Trinidad assets. In addition to the plants, Koch Nitrogen purchased 12 ammonia terminals in Illinois, Iowa, Kansas, Minnesota, Nebraska, and Texas (Green Markets, 2003g).

In July, Farmland signed a letter of intent to sell its Coffeyville assets to Pegasus Partners II LP. The letter of intent included the entire complex, including the petroleum refinery, nitrogen plant, and ancillary assets (Green Markets, 2003d). JAS Marketing Inc., a Houston, TX-based equipment broker acquired the major plant components of Farmland's shuttered Lawrence, KS, nitrogen complex for $725,000. Because this plant used an older generation of technology, it is expected that the plant will be dismantled and the equipment sold piecemeal. The complex consisted of ammonia, urea, and nitric acid plants (Green Markets, 2003b).

In April, Mississippi Chemical purchased Melamine Chemicals Inc. (a subsidiary of Borden Chemical Inc.). Mississippi Chemical had closed its nearby Donaldsonville, LA, urea facility in 2002 because Borden had closed the melamine plant, which was the principal purchaser of urea from Mississippi Chemical's plant. With its purchase of the melamine facility, Mississippi Chemical reopened the liquid urea portion of its facility (Mississippi Chemical Corp., 2003b§).

In May, Mississippi Chemical filed for reorganization under Chapter 11 of the U.S. Bankruptcy Code. The filing included the parent company as well as its nitrogen subsidiaries—MissChem Nitrogen LLC, Triad Nitrogen LLC, and Melamine Chemicals. The company cited depression in the agricultural sector and volatility in natural gas prices as the principal reasons for filing for bankruptcy (Green Markets, 2003i).

In December, Dyno Nobel ASA acquired the ammonia-ammonium nitrate assets of El Paso Corp. for about $57 million. The acquisition included ammonia-manufacturing capacity of 275,000 t/yr at Cheyenne, WY, and St. Helens, OR, and ammonium nitrate production capacity of 318,000 t/yr of low-density ammonium nitrate prill and 91,000 t/yr of ammonium nitrate solution at Cheyenne and Battle Mountain, NV (Green Markets, 2003c). El Paso had acquired the nitrogen plants in a 2001 merger with Coastal Corp.

Potash Corp. of Saskatchewan (PCS) indefinitely shut down its 372,000-t/yr Memphis (Woodstock), TN, ammonia plant and suspended production of ammonia and nitrogen solutions at its Geismar, LA, facility in the second quarter, citing high U.S. natural gas costs and low product margins. In the third quarter, management decided to close the unprofitable plants permanently. PCS took a charge of $118.8 million in connection with the shutdowns in its third quarter financial statement, which included a writedown of certain plant assets and costs associated with eliminating about 190 jobs by the end of 2003 (Potash Corp. of Saskatchewan, 2003§).

In July, Terra Industries mothballed its Blytheville, AR, nitrogen facility indefinitely and said that it would only operate the facility from time to time as conditions warrant. The plant

had the capacity to produce 381,000 t/yr of ammonia and 435,000 t/yr of urea. The plant had been closed since the end of June, and 60 employees had been laid off. The company cited a seasonal slowdown in demand and continued high natural gas costs as the principal reasons for the closure. Terra Industries decided that future market conditions might not justify an ongoing investment in maintenance and replacement capital necessary to extend operations for the rest of the plant's useful life (Green Markets, 2003n). The plant was permanently closed in 2004.

Nitram Inc., an ammonium nitrate producer, closed its Tampa, FL, plant in August after filing for bankruptcy earlier in the year. The company was investigating the sale of the plant, which had the capacity to produce 281,000 t/yr of ammonium nitrate (agricultural and industrial grades) and 204,000 t/yr of nitric acid (Green Markets, 2003l). In a November bankruptcy auction, LSB Industries Inc. acquired Nitram's equipment for $1.3 million, and Kinder Morgan Inc. acquired the real estate for $1.6 million (Green Markets, 2003a).

Unocal Corp. announced that it has made a natural gas discovery at its Happy Valley prospect located about 11 kilometers (km) southeast of Ninilchik on Alaska's Kenai Peninsula. First production from Happy Valley was planned for the fourth quarter of 2004. Average production from the field was expected to be 566,000 to 708,000 cubic meters per day during 2005. Unocal estimated that the field contains 2.1 billion to 2.8 billion cubic meters of recoverable natural gas, with finding and development costs averaging around $1.75 per million cubic meters. Unocal holds a 100% working interest in the property. This could provide additional natural gas resources for Agrium's Kenai ammonia plant, which has been operating below its rated capacity because of limited gas supplies (Green Markets, 2003o).

Environment

Hypoxia in the Gulf of Mexico recently has become a controversial environmental concern for the fertilizer industry and an issue that spawned significant research efforts to determine its cause. "Hypoxia in the Gulf of Mexico" refers to the phenomenon that happens in an area along the Louisiana-Texas coast where water near the bottom of the gulf contains less than 2 parts per million of dissolved oxygen. Hypoxia can cause stress or death in bottom-dwelling organisms that cannot move out of the hypoxic zone. Some studies postulated that nitrate runoff from fertilizers is the principal cause of hypoxia, while others cited other causes for the hypoxic zone.

After completing their annual mapping for 2003, researchers from the Louisiana Universities Marine Consortium concluded that two tropical storms in the last 2 weeks of July mixed up the coastal waters of the northern Gulf of Mexico and disrupted the usual widespread extent of summertime waters severely depleted in oxygen. The result was a significantly smaller dead zone in summer 2003 than what has been the average size for the past 10 years. The size of the dead zone mapped on a 6-day cruise was 8,560 square kilometers (Louisiana Universities Marine Consortium, 2003§). The U.S. Geological Survey (USGS) calculated nutrient flux estimates for July 2002 through June 2003. The 2003 flux of total nitrogen to the Gulf of Mexico was 1.08 Mt, the third smallest total nitrogen flux in the past 24 years (U.S. Geological Survey, 2003a§).

In addition, the USGS Midcontinent Agricultural Chemical Research Project has an ongoing research project to quantify the existence, movement, flux, fate, and effects of agricultural chemicals in parts of 25 States. Project researchers are identifying the sources of agricultural chemicals (insecticides, herbicides, fungicides, fertilizers, and others) to the environment and the factors that affect their dispersal from point of application to groundwater, small streams, large rivers, reservoirs, precipitation, and the atmosphere. The overall goal of this research is to collect and synthesize agricultural-chemical-related water-quality information to help resource managers, policymakers, and the public develop agricultural management practices that protect the region's water resources (U.S. Geological Survey, 2003b§).

Consumption

In 2003, apparent consumption of ammonia fell by about 2% to 14.2 Mt of contained nitrogen. Apparent consumption is calculated as the production plus imports minus exports, adjusted to reflect any changes in stocks. Consumption of nitrogen fertilizers in the United States for the 2003 crop year (ending June 30, 2003) is listed in table 5. Consumption of 12.8 Mt of contained nitrogen was about 17% higher than that of 2002. Anhydrous ammonia was the principal fertilizer product, representing 22% of fertilizer consumption.

Urea and UAN solutions constituted 38% of fertilizer consumption during the 2003 crop year. Urea is typically 45.9% nitrogen, and UAN solutions are typically 29.8% to 29.9% nitrogen. Ammonium nitrate containing 33.9% nitrogen constituted 4% of 2003 nitrogen fertilizer consumption, and fertilizer consumption of ammonium sulfate, based on nitrogen content, was 2% of the total U.S. nitrogen-based fertilizer market.

Stocks

Stocks of ammonia at yearend 2003 were 0.167 Mt, a decrease of 34% from comparable stocks at yearend 2002, according to data published by the U.S. Census Bureau (table 6). Stocks data collected by The Fertilizer Institute (TFI) have been withheld since April 2003; the USGS had begun reporting and using these data to calculate apparent consumption because they were more readily available and may have been more accurate. Apparent consumption for 2003 was calculated using the difference between stocks reported by the U.S. Census Bureau instead of using 2002 TFI data to minimize fluctuations caused by using different data series.

Transportation

Ammonia was transported by refrigerated barge, rail, pipeline, and truck. Three companies served 11 States with 4,950 km of pipelines and 4,800 km of river barge transport; rail and truck were used primarily for interstate or local delivery.

Kaneb Pipe Line Partners LP operated the Gulf Central ammonia pipeline. The 3,070-km pipeline originates in the

Louisiana Delta area and has access to three marine terminals. It moves north through Louisiana and Arkansas into Missouri, where it splits at Hermann, MO, one branch going east into Illinois and Indiana and the other branch continuing north into Iowa and then turning west into Nebraska. The capacity of this pipeline was about 2 Mt/yr, with a storage capacity of more than 1 Mt. CF Industries and Cargill Fertilizer Inc. jointly operated the 135-km Tampa Bay Pipeline (TBP) system. The TBP moved nitrogen compounds and ammonium phosphate for fertilizer producers in Hillsborough and Polk Counties, FL. Magellan Midstream Partners LP's 1,750-km ammonia pipeline that originates at production facilities in Borger, TX, Verdigris, OK, and Enid, OK, and terminates in Mankato, MN, has a maximum delivery capacity of about 820,000 t/yr. It transports ammonia to 13 delivery points along the pipeline system and has a storage capacity of about 500,000 metric tons (t).

Williams Energy Partners LP changed its name, effective September 1, to Magellan Midstream Partners LP. The name change was effective after Williams Co., which had been the principal owner in Williams Energy Partners, sold its 54.6% interest to an entity owned by Madison Dearborn Partners LLC and Carlyle/Riverstone Global Energy and Power Fund II LP (Green Markets, 2003k).

Prices

Midyear and yearend prices for nitrogen materials are listed in table 7. The spike in the natural gas price at the beginning of 2003 drove ammonia prices up significantly (figure 1). Between the end of January and mid-March, the average Gulf Coast ammonia price rose by about $130 per short ton ($143 per metric ton) to reach $305 per short ton ($336 per metric ton). The average ammonia price fell as the natural gas price fell and reached a low of $228 per short ton ($251 per metric ton) in mid-July where it stabilized until mid-September. The ammonia price then began to rise slowly and reached $290 per short ton ($320 per metric ton) by yearend (figure 2). Within the past 5 years, natural gas prices have risen by about $4.00 per million British thermal units, and average Gulf Coast ammonia prices have increased by about $200 per short ton ($220 per metric ton).

Urea and ammonium nitrate prices rose steadily throughout 2003 and were higher than prices in 2002 (figures 3, 4). Both prices spiked early in the year in response to the increased ammonia feedstock price. The average Gulf Coast granular urea price increased from $130 per short ton ($143 per metric ton) at the beginning of 2003 to $194 per short ton ($214 per metric ton) by yearend. The average ammonium nitrate price followed a similar pattern increasing from $125 per short ton ($138 per metric ton) to $193 per short ton ($213 per metric ton) by yearend.

Ammonium sulfate, however, did not show the same large increase in prices as other nitrogen compounds. This is because much of the ammonium sulfate in the United States is produced as a byproduct of caprolactam production and does not respond as directly to the changes in natural gas pricing. Average ammonium sulfate prices rose slightly during the 2003 from $125 per short ton ($138 per metric ton) to $138 per short ton ($152 per metric ton) (figure 5).

Foreign Trade

Ammonia exports were about 8% lower than those in 2002 (table 8). The Republic of Korea continued to be the leading destination for U.S. exports of ammonia, accounting for 85% of the total. Most of the material shipped to the Republic of Korea was produced at the Agrium plant in Alaska.

Ammonia imports were 22% higher than those in 2002 (table 9). Trinidad and Tobago (53%) continued to be the leading import source. Russia (21%) and Canada (16%) were the remaining significant import sources. The U.S. Census Bureau reclassified the country of origin of some of the ammonia imports in 2002. A significant quantity of material that was originally classified as imported from Ukraine actually originated in Russia. This is reflected in the data in table 9. Some of the confusion may have arisen because material from Russia and Ukraine is shipped from the same port in Ukraine.

Tables 10 and 11 list trade of other nitrogen materials and include information on principal source or destination countries. Exports of nitrogen materials declined in 2003, with the exception of MAP. Changes in imports of nitrogen materials were mixed compared with imports in 2002. The larger volume imports (ammonia, ammonium nitrate, nitrogen solutions, and urea) all increased significantly from the 2002 level. The increase in imports of these materials partially compensated for the drop in U.S. production.

World Review

Anhydrous ammonia and other nitrogen materials were produced in more than 80 countries. Global ammonia production in 2003 increased slightly from that of 2002 (table 12). In 2003, total ammonia production was 109 Mt of contained nitrogen, according to data reported to the USGS. China, with 28% of this total, was the largest world producer of ammonia. Asia contributed 46% of total world ammonia production, and the Commonwealth of Independent States (CIS), Estonia, and Lithuania produced 14% of the global total. North America represented 12% of the total; Western Europe, 9%; the Middle East, 7%; Central America and South America, 6%; and Africa, Eastern Europe, and Oceania contributed the remaining 6%.

In 2003, world ammonia exports of 13.8 Mt of contained nitrogen were about 8% higher than those in 2002. Trinidad and Tobago (24%), Russia (18%), Ukraine (11%), Indonesia (9%), and Canada (5%) accounted for 67% of the world export total. The United States imported 39% of global ammonia trade, followed by Asia (22%) and Western Europe (22%) (International Fertilizer Industry Association, 2004a).

In 2003, world urea production increased by 1.4% to 53.0 Mt of contained nitrogen. Urea exports increased by about 10% to 13.0 Mt of contained nitrogen. China and India, the two largest producing countries, accounted for 48% of world production; production in China increased by about 4%, and production in India increased by 3% compared with those of 2002. The United States and Canada produced about 8% of the total. The CIS, Estonia, and Lithuania exported the largest quantity of urea with 27% of the total. The Middle East accounted for 22% of

total exports; Asia, 19%; North America, 8%; Central America and South America, 7%; Africa, 6%; Eastern Europe, 6%; and Western Europe, 5%. North America and Asia each accounted for 25% of global urea imports; Central America and South America, 17%; Western Europe, 15%; and Africa and Oceania, 6% each (International Fertilizer Industry Association, 2004c). The above percentages for trade in ammonia and urea reflect material that is shipped intraregion as well as material that is shipped among regions; for example, material shipped from Canada to the United States is included in the North American trade shipments.

Commonwealth of Independent States.—On September 19, 2003, Belarus, Kazakhstan, Russia, and Ukraine signed a common economic space agreement called the CIS Common Economic Space (CES). The CES is a multiphase agreement, which asserts that each member state will be able to control the speed of integration although all phases were expected to be completed within 5 to 7 years. The treaty would create a free trade zone among the countries and would allow them to formulate policies to create a customs union and common electricity and gas tariffs. For example, fertilizer trade between Russia and Ukraine has been affected by high tariffs on transportation, and the new agreement could give fertilizer producers low-cost access to certain ports and increase trade between the countries. In addition, the agreement could allow Belarus, Kazakhstan, and Ukraine access to Russia's lower cost energy resources. There were concerns that the agreement would complicate Ukraine's attempt to join the European Union and would be reminiscent of the organization of the former Soviet Union (Fertilizer Week, 2003e; Warner, 2003§).

European Union.—The European Commission substituted a confidential minimum import price on imports of UAN from Lithuania, replacing the €3.98 per ton antidumping duty that was established in 2000. The minimum import price will be voided by May 2004 when Lithuania becomes a member of the European Union (Fertilizer Week, 2003i).

Australia.—Burrup Fertilisers Pty. Ltd. (a wholly owned subsidiary of India's Oswal Group) signed a long-term offtake agreement with Hygro Agri (now Yara International ASA) in February for ammonia from its proposed 750,000-t/yr plant near Karratha, Western Australia. A fixed-price A$300 million contract was signed with Canada's SNC-Lavalin Group Inc. to cover the engineering and procurement for the plant. Plant construction began in late 2003, and it was scheduled to be completed by early 2005 (Fertilizer International, 2003). Burrup Fertilisers also completed a prefeasibility study for a proposed ammonia-urea plant with capacities of 860,000 t/yr of ammonia and 1.6 Mt/yr of urea at the same site as its ammonia plant under construction. A full feasibility study is scheduled to be completed by mid-2004, and if construction is approved, then the new plants would be completed by the beginning of 2008 (Asia Fertilizer & Agronomic Bulletin, 2003b).

Following an 8-week extension, the Dampier Nitrogen Project development agreement among Agrium, Plenty River Corp., Theiss Pty., and Uhde GmbH expired on July 31. The consortium had planned to construct an ammonia-urea complex on the Burrup Peninsula, but the parent companies could not sign a joint-venture agreement because they were still negotiating the price on an engineering, procurement, and construction contract (Fertilizer Week, 2003d). In October, Agrium decided to proceed independently with a feasibility study for an ammonia-urea project on the Burrup Peninsula and was competing with the Plenty River-Thiess-Uhde consortium for the site that was formerly allocated for the Dampier Nitrogen Project. The West Australia Department of Mineral and Petroleum Resources decided to allow the two groups to submit expressions of interest addressing specific criteria, and the department would allocate the land to the winner for 3 months initially, with quarterly options for up to 1 year, depending on the progress made on the land (Fertilizer Week, 2003m).

Bulgaria.—Agropolychim JSC closed its ammonium nitrate plant from May through September and invested $3 million to improve the plant's energy efficiency and environmental performance (Fertilizer Week, 2003a).

Canada.—In July, Methanex Corp. acquired Pacific Ammonia Inc.'s 225,000-t/yr ammonia plant in Kitimat, British Columbia, for $20 million, to be paid in installments through to the end of 2005. Under the previous ownership structure, Methanex was obligated to supply byproduct hydrogen from its nearby methanol plant to Pacific Ammonia for the manufacture of ammonia. This obligation was scheduled to expire in 2011. As part of the new transaction, Methanex entered into an agreement to supply Mitsui & Co. Ltd. (the parent company of Pacific Ammonia) with 100% of the ammonia produced through to the end of 2005. Pacific Ammonia had purchased the ammonia plant from Methanex in 1995 (Green Markets, 2003h).

In June, Saskferco Products Inc. announced that it would build a new UAN facility at its manufacturing plant near Belle Plaine, Saskatchewan. Construction of the new facility was planned to start immediately, with the first product expected in spring 2004. When fully operational, Saskferco will produce 230,000 t/yr of UAN for shipment via truck and rail. The company produced ammonia and granular urea at the Belle Plaine facility (Fertilizer Week America, 2003b).

Chile.—On November 20, Sociedad Quimica y Minera de Chile S.A. (SQM) signed an agreement to purchase all the shares of PCS Yumbes S.C.M. from PCS for $35 million. PCS Yumbes, which was acquired by PCS in 1999, held mining concessions on certain sodium nitrate reserves in the Atacama Desert in northern Chile and was a producer of potassium nitrate, sodium nitrate, and iodine. The purchase agreement included all the mining concessions, water rights, and all other assets of PCS Yumbes, excluding its contractual obligations and liabilities. The companies expected to close the deal by the end of 2004 (Fertilizer Week, 2003w). PCS held approximately 20% of the issued and outstanding equity of SQM.

By the end of 2003, Atacama Minerals Corp. completed construction of the pilot mechanical leach plant at its Aguas Blancas operation that it will use to produce sodium sulfate and sodium and potassium nitrates. Design and development of a full-scale commercial plant was scheduled to be completed by September 2004. At full production, the plant will produce 300,000 t/yr of sodium sulfate, 100,000 t/yr of nitrates, and 1,500 t/yr of iodine (Atacama Minerals Corp., 2003§).

China.—The State Economic and Trade Commission allocated 1.8 Mt of urea import quotas for 2003, 1.63 Mt of which was for state-owned companies.

The first long-distance onshore pipeline to carry natural gas to south China's island province of Hainan was completed in August. The $48 million trunkline runs 247 km and links the Dongfang 1-1 field with eight counties in western Hainan and the provincial capital, Haikou. CNOOC Gas and Power Co. Ltd. (a subsidiary of China National Offshore Oil Corp.) owned 70% of the pipeline, and Hainan Fuel Chemical Corp. owned the remaining 30%. The pipeline initially was expected to deliver 800 million cubic meters per year of natural gas to supply powerplants and industrial users, including the second phase of Hainan Fudao Fertilizer Co. Ltd.'s fertilizer plant (China Daily, 2003§). Hainan Fudao began trial production at its new 800,000-t/yr urea plant in June; this was part of a new complex that included a 450,000-t/yr ammonia plant. The new complex would increase Hainan Fudao's capacity to 750,000 t/yr of ammonia and 1.32 Mt/yr of urea (Fertilizer Week, 2003c).

Jilin Petrochemical Co. started up a new 300,000-t/yr ammonia plant at its calcium carbide plant in Jilin. Liuzhou Chemical Industrial Co. Ltd. began a $63 million revamp of its ammonia plant in Guangxi Province. The revamp was expected to increase capacity by 30% to 260,000 t/yr and reduce production costs by 20% (Asia Fertilizer & Agronomic Bulletin, 2003f).

Several companies in China were retrofitting ammonia plants to convert from naptha feedstock to coal using coal gasification technology supplied by Shell Corp. Hubei Chemical Fertilizer Co. and Baling Co. [subsidiaries of China Petroleum and Chemical (Petrochemical) Corp. (Sinopec)] were the most recent companies to announce the technology change. The conversion of Hubei Chemical's existing plant in Zhijiang, Hubei Province, was expected to be completed by the end of 2005. Ammonia capacity will be increased to 390,000 t/yr from 320,000 t/yr, and urea capacity will be increased to 570,000 t/yr from 560,000 t/yr. Baling's ammonia capacity at its plant in Yueyang, Hunan Province, will be increased to 380,000 t/yr from 330,000 t/yr, and urea capacity will be increased to 650,000 t/yr from 600,000 t/yr by 2004. Two other Sinopec subsidiaries, Jinling Co. and Anqing Co., will also convert to Shell's coal gasification technology, but capacities will not be increased. These plants were due to come onstream in 2004 (Asian Chemical News, 2003; Zuideveld and de Graaf, 2003§).

Plants belonging to Irish Fertilizer Industries Ltd. (IFI) were sold to an unidentified Chinese company by KPMG International, which was selling the bankrupt company's assets. IFI ceased operation in October 2002. The sale consisted of a 530,000-t/yr ammonia plant, a 400,000-t/yr urea plant, two 230,000-t/yr calcium ammonium nitrate plants, and a 460,000-t/yr calcium ammonium nitrate granulation unit (Asia Fertilizer & Agronomic Bulletin, 2003c).

The Chinese Government reclassified ammonium nitrate as a nonmilitary explosive, which essentially removed it from use as a fertilizer and made it subject to much more stringent safety requirements. About 54 companies in China manufactured ammonium nitrate, and a significant portion of these firms planned to switch to production of nitrogen-phosphorous-potassium (NPK) fertilizers (Asia Fertilizer & Agronomic Bulletin, 2003a).

Egypt.—Egypt Kuwait Holding Co. S.A.E. signed an agreement to form a new fertilizer company with state-owned Abu Qir Fertilizers and Chemical Industries Co. to oversee the construction of the Abu Qir IV 660,000-t/yr ammonia-urea project. The plant, which was scheduled to be completed in 2005, was supposed to produce ammonia and ammonium nitrate. Because of the devaluation of the Egyptian pound and increasing restrictions on ammonium nitrate production, transport, and storage, the Government decided to produce urea instead. Feedstock gas for the plant was expected to be supplied by Fayoum Gas Co. (a joint venture between Shell Chemical and Egypt Kuwait Holding) (Fertilizer Week, 2003f).

Estonia.—After being closed since April 2002, Nitrofert JSC, the country's only fertilizer producer, restarted production at its ammonia-urea complex in Kohtla-Järve in July 2003 only to have its equipment flooded by heavy rainfall at the beginning of August. The plant was able to restart operation again by the end of August. The country's gas producer Mezregiongaz had pulled out of a long-term natural gas supply contract in April 2002, but Nitrofert was able to secure a long-term power contract with Eural Trans Gas Kft., a company that traded gas in Ukraine, Turkmenistan, and Western Europe (Fertilizer Week, 2003q).

India.—In July, India's Ministry of Finance instituted interim antidumping duties on imports of ammonium nitrate from Russia and Iran, but there was a dispute between Indian officials and Russian ammonium nitrate producers on the type of data used in the assessment. The dispute arose mainly because India did not recognize Russia as a market economy country. At yearend, the duties were not finalized. In addition, in response to a petition filed by Indian ammonium nitrate producers, the country began a dumping investigation on imports of ammonium nitrate from Ukraine in November (Fertilizer Week, 2003n).

Indonesia.—PT Pupuk Kalimantan Timur Tbk. started up its Kaltim IV 330,000-t/yr ammonia plant in May. This will provide feedstock for the urea plant at the same site that was started up in 2002. A gas price of $1.90 per million British thermal units was negotiated for the first 10 years of the plant's operation, rising to $2.40 per million British thermal units for the second 10 years (Asia Fertilizer & Agronomic Bulletin, 2003e).

Iran.—Shiraz Petrochemical Co. (SPC) (a subsidiary of National Petrochemical Co.) planned to expand its urea output by 20%. It awarded an engineering, procurement, and construction contract to Czech Republic-based Chemoprojekt a.s. to increase SPC's urea output to 594,000 t/yr from 495,000 t/yr. The project will take 24 months to complete and was expected to be completed in 2005 (National Petrochemical Co., 2003§).

Iraq.—Poland's Zakłady Chemiczne Police SA was expected to help restart Iraq's ammonia and urea capacity that was damaged in the 1991 Gulf War. The ammonia plant in al-Qaim has a capacity of 50,000 t/yr and was originally constructed by Polish engineering company Krakow Chemadex in the 1980s; Police was familiar with the plant because its engineers had assisted with the original startup (Asia Fertilizer & Agronomic Bulletin, 2003g).

Italy.—After EniChem S.p.A. closed its caprolactam and byproduct ammonium sulfate plant in Porto Marghera in early 2003, the company began producing synthetic ammonium sulfate in March 2004. No specific capacity figures were given for the synthetic ammonium sulfate plant, but the company said it was producing significantly less compared with the byproduct,

for which it had a production capacity of 350,000 t/yr (Fertilizer Week, 2003h).

Japan.—Showa Denko K.K. was constructing a 65,000-t/yr ammonia plant in Kawasaki to gasify municipal waste as a feedstock. In addition to ammonia, the plant will recycle sulfur, metallic impurities, and chlorine. The plant was scheduled to be completed in the first half of 2004 (Asia Fertilizer & Agronomic Bulletin, 2003d).

Mexico.—In April, Mexico imposed antidumping duties on imports of ammonium nitrate from Ukraine. The duty was the result of an investigation that began in 1997 and was calculated based on a cost-plus-freight price of $175.25 per metric ton; the duty would be the difference between the sale and cost-plus-freight prices (Fertilizer Week America, 2003a). Mexico's urea industry has been idle since 1999 because of high natural gas and ammonia prices.

Mexico's state oil company Petróleos Mexicanos (Pemex) announced that it would mothball its 150,000-t/yr ammonia complex at Petroquimica Camargo because of high electricity and raw material costs. In addition, the complex also was too small to compete with world-scale units. Pemex also had 2 Mt/yr of ammonia capacity at Cosoleacaque (Sissell, 2003).

Grupo Acerero del Norte S.A. de C.V. (GAN) was considering relocating one of its Mexian urea plants to Peru to take advantage of potentially less expensive gas supplies from Peru's Camisea gasfield, which was under development. GAN also was considering producing ammonia feedstock in Peru, but it would have to build a new unit or purchase a secondhand plant because it had no ammonia production capacity (Fertilizer Week, 2003o).

Nigeria.—The Government sold its 51% share of National Fertilizer Co. of Nigeria (Nafcon) to South African phosphate producer Foskor Ltd. in July. Nafcon has the capacity to produce 1,000 metric tons per day (t/d) of ammonia, 1,500 t/d of urea, and blended fertilizers at its facility in Onne, Rivers State, but the facilities needed extensive renovation (Fertilizer Week, 2003l).

Oman.—Engro Chemical Pakistan Ltd. and Oman Oil decided not to construct an ammonia-urea complex at Sohar because the capital cost for the proposed urea plant was too high for the plant to be operated economically. As part of the joint venture, the firms had an option to purchase Kemira Agro Oyj's mothballed ammonia plant at Rozenburg, Netherlands, which was closed in 2000, but the option was allowed to expire at the end of September 2003 (Fertilizer Week, 2003g).

Poland.—The Ministry of Treasury approved restructuring plans for the country's fertilizer industry that it hoped would allow the industry to be privatized before Poland's entry into the European Union in May 2004. The plan involved the creation of one melamine- and fertilizer-producing company by merging Zakłady Azotowe "Kędzierzyn" S.A., Zakłady Azotowe "Police" S.A., Zakłady Azotowe "Pulawy" S.A., and Zakłady Azotowe w Tarnowie-Mościcach S.A., which were the four companies that are available to be privatized. There was some dissention about the restructuring plan among the four companies, and no final plan was determined by yearend (Fertilizer Week, 2003p).

Qatar.—Qatar Fertiliser Co. (Qafco) planned to increase ammonia and urea capacity at its Qafco III fertilizer complex in Messaieed by the third quarter of 2005. Ammonia capacity will be increased by 400 t/d to 1,900 t/d, and urea capacity will be increased by 800 t/d to 3,000 t/d. Germany's Uhde was awarded the engineering contract for the expansion. In addition to the Qafco III expansion, the company's Qafco IV plant, with capacities of 2,000 t/d of ammonia and 3,500 t/d of urea, was expected to be completed by 2005 (Fertilizer Week, 2003s).

Romania.—In March, Fletcher Group LLC purchased the Government's 79.05% share in S.C. Nitramonia S.A. The buyer had committed to keep all the company's workers for the next 5 years and to continue to produce the same products. Nitramonia produced ammonia, ammonium nitrate, explosives, and other nitrogen-base chemicals (Fertilizer Week, 2003k). The Government's ownership in fertilizer producer S.C. Turnu S.A. (95.68%) and oil and gas producer SNP Petrom S.A. (51%) were also offered for privatization. S.C. Turnu has the capacity to produce 600,000 t/yr of ammonia and 500,000 t/yr of urea in addition to other fertilizer products, and Petrom's subsidiary Doljchim has the capacity to produce 600,000 t/yr of ammonia and 400,000 t/yr of urea as well as other fertilizer products.

Russia.—EuroChem (part of Russia's MDM Group) announced that it would construct a $40 million multipurpose terminal at Tuapse on the Black Sea that would allow the company to ship its fertilizer products without relying on foreign seaports, such as Yuzhnyy, Ukraine, or Kotka, Finland. The new terminal was expected to have a shipping capacity of 3 Mt/yr and ship primarily ammonium nitrate, urea, and phosphates, although it would have some ammonia shipping ability. Construction of the terminal, which was fully funded, was scheduled to start in mid-2003 (Fertilizer Week, 2003j).

In July, Russia's Federal Property Fund sold its 41.01% share of Cherepovets Azot to investment bank TRUST, (a member of the Menatep Group) for $9.33 million. As a result, Menatep controlled more than 67% of Cherepovets, which had the capacity to produce 495,000 t/yr of ammonia, 450,000 t/yr of urea, and 450,000 t/yr of ammonium nitrate (Fertilizer Week, 2003b).

Saudi Arabia.—Saudi Arabian Fertilizer Co. (Safco) (a subsidiary of Saudia Arabia Basic Industries Co.) awarded a $520 million contract to Germany's Uhde to construct the Safco IV ammonia-urea complex in Jubail. Ammonia and urea capacities at the complex would be 3,300 t/d and 3,250 t/d, respectively. Construction began in the fourth quarter of 2003, and the complex was expected to be completed by late 2005 (Fertilizer Week, 2003u). The board of directors of Safco also approved expansion of the company's Dammam plant that would increase capacities by 1 Mt/yr of ammonia and 1.1 Mt/yr of urea. The expansion was scheduled to come onstream in early 2006 (Green Markets, 2003p).

Trinidad and Tobago.—In addition to buying Farmland's U.S. nitrogen assets, Koch Nitrogen purchased Farmland's 50% share of Point Lisas Nitrogen Ltd. (formerly Farmland MissChem Ltd.) at a cost of $122 million in May (Green Markets, 2003e). In October, Mississippi Chemical, which owned the remaining 50% of Point Lisas Nitrogen, signed an agreement with Koch Nitrogen for the remaining 50% of the plant's ownership (Green Markets, 2003f). In December, however, Mississippi Chemical announced that the U.S. Bankruptcy Court approved its entry into a $96.7 million supplemental postpetition credit agreement,

a term loan that will be managed by Delaware Street Capital and DDJ Capital Management LLC to refinance a portion of the company's existing secured bank debt. The term loan will be used to reduce prepetition secured bank debt by $90 million and to pay transaction-related fees and expenses of approximately $6.7 million. This loan would allow the company to retain its 50% equity interest in Point Lisas Nitrogen. The term loan facility would mature on October 31, 2004 (Mississippi Chemical Corp., 2003a§). Point Lisas Nitrogen was completed in 1998 and can produce 1,850 t/d of ammonia.

Turkey.—In August, the Turkish Privatization Agency offered three of the four fertilizer subsidiaries of Türkiye Gübre Sanayii (Tügsas)—Gemlik Gübre Sanayi A.Ş., Samsun Gübre Sanayi A.Ş., and İGSAŞ-İstanbul Gübre Sanyi A.Ş.—for privatization. Bids were expected to be submitted by October 17. The fourth subsidiary of Tügsas, Kütahya Gübre Sanayi A.Ş., produced fertilizer primarily for the Ministry of Defense, and the Privatization Agency said it would be offered for privatization at a later date. By yearend, no buyer was announced (Fertilizer Week, 2003y).

Ukraine.—Azot Severodonetsk modernized one of its two ammonia lines at its plant in Luhansk in the third quarter. The modernization did not increase the company's capacity but included the replacement of outdated equipment that would allow the company to operate one line at its full capacity of 495,000 t/yr. The second line also had the capacity to produce 495,000 t/yr of ammonia (Fertilizer Week, 2003v). JSC Stirol increased its urea production capacity to 1,500 t/d from 1,350 t/d at Gorlovka after Swiss firm Casale Chemicals S.A. completed a revamp of the company's plant (Fertilizer Week, 2003x).

In September, the State Property Fund sold its 53.86% ownership of RivneAzot to Austria's Raiffeisenbank Investment AG (RIAG) for $9.3 million. RIAG will pay RivneAzot's wage arrears and debts to the company's pension fund and will invest $7.75 million during 1 year to upgrade the company's facilities in Rivne. The company had the capacity to produce 600,000 t/yr of ammonia and 520,000 t/yr of ammonium nitrate in addition to other fertilizer commodities, but production had been significantly below capacity in recent years (Fertilizer Week, 2003t).

Beginning on May 16, Ukraine began monitoring imports of ammonium nitrate into the country; Russia was the only import source of ammonium nitrate in 2003. Ukraine's Ministry of Economy conducted an investigation of ammonium nitrate imports during the first 5 months of 2003 and determined that imports of ammonium nitrate cost about $4 to $6 per metric ton less than locally produced material. As a result importers will be required to have a 90-day permit and a certificate of origin for all ammonium nitrate imports into Ukraine (Fertilizer Week, 2003z).

Vietnam.—Vietnam National Chemical Corp. (Vinachem) delayed plans to construct a 330,000-t/yr coal-based ammonia plant at Ha Bac. The company cited problems in finding a technology licensor and securing funds as the reasons for the delay. Vinachem continued talks with ChevronTexaco Corp. and Shell Chemical about their coal gasification technologies and with Snamprogetti S.p.A. and Stamicarbon (a unit of Koninklijke DSM N.V.) about technology for a proposed 570,000-t/yr urea plant planned for the same location (Asia Fertilizer & Agronomic Bulletin, 2003h). Vinachem announced that it was building the country's first ammonium sulfate plant near its proposed DAP plant in Dinh Vu Economic Zone. Completion of the 150,000-t/yr plant was scheduled for early 2006. Ammonia and sulfuric acid feed material for the plant was expected to be imported, but the plant's output would be for the domestic market (Fertilizer Week, 2003aa).

Vietnam Oil and Gas Corporation (PetroVietnam) had a shortfall of $250 million for its proposed power and fertilizer complex in Ca Mau because of the depreciation of the U.S. dollar against the euro and additional expenses for soil improvement at the site. The cost of the urea project was increased to $560 million from the original estimate of $492 million. Although the company had raised $1.05 billion from various sources, PetroVietnam was awaiting the Government's permission to borrow from foreign banks or by export credit (Fertilizer Week, 2003r).

Current Research and Technology

A memorandum of understanding between the U.S. Department of Agriculture (USDA) and the National Aeronautics and Space Administration (NASA) will give the USDA access to NASA's mapping, monitoring, and systems engineering technology. The idea behind the partnership was to improve farmers' yields and provide NASA with information for an initiative to study the Earth's response to farming. The USDA began a $1 million 3-year program to establish geospatial extension programs at land-grant universities. According to the USDA, several new technologies will be available to farmers under this agreement, including monitors and maps to detect and record changes in yields, soil properties, and crop conditions; the use of sensors to vary the application rate and timing for seeds, fertilizers, pesticides, and irrigation water; and vehicle guidance systems to provide sensing for weed and pest populations and detect crop properties, such as protein content, during harvest (Green Markets, 2003j).

Outlook

According to the USDA's National Agricultural Statistical Service, farmers' planting intentions for the 2004 crop year were estimated to be 100.8 million hectares (Mha) for the eight major field crops, slightly lower than the 101.0 Mha planted in 2003 (U.S. Department of Agriculture, National Agricultural Statistical Service, 2004§). Corn growers intended to plant 32.0 Mha of corn, slightly higher than the 31.9 Mha planted in 2003. Corn acreage was projected to be higher throughout much of the Corn Belt as growers were hoping to take advantage of higher corn prices. However, most States in the Southeast and southern Great Plains are intending to decrease their corn plantings with producers switching to soybeans and cotton because of more favorable prices relative to corn. With these 2004 projections, nitrogen demand by the fertilizer industry should be about the same as that in 2003.

Long-term projections by the USDA's Economic Research Service indicated that projected plantings for eight major field crops in the United States were expected to remain relatively stable at about 101 Mha through the 10-year forecast period (U.S. Department of Agriculture, Economic Research Service,

2004§). Corn, soybeans, and wheat account for about 86% of this acreage. The USDA expected that corn acreage would rise gradually as increasing domestic and export demands lead to rising prices. Feed and residual use of corn is initially unchanged with fewer cattle on feed and lower pork production offsetting increases in poultry output. Feed use then rises through the remainder of the projections as meat production increases. Significant growth is expected for ethanol use during the next several years as many States ban methyl tertiary butyl ether as a fuel oxygenate. U.S. corn exports are expected to rise faster than global trade, with the United States increasing its market share.

Natural gas prices in the United States will continue to be the principal influence on ammonia production. If they continue to be high, some high-cost ammonia plants in the United States will close because they can not compete with lower priced, imported ammonia. At the end of 2003, natural gas prices were nearly $6 per million British thermal units; prices continued to be high in 2004, ranging between $5 and $7 per million British thermal units for the first half of the year. Many countries produced natural gas for less than $1.50 per million British thermal units and, as a result, could produce ammonia for substantially less than U.S. producers. One possibility for continued U.S. ammonia production is to switch feedstock from natural gas to gasified coal, but this would require additional investment in coal gasification plants. Another possibility would be to use imported liquefied natural gas (LNG) as a feedstock. This would help ease U.S. natural gas price volatility but would still lead to ammonia production costs that are higher than those at plants that are supplied by low-cost natural gas feedstock. Industry analysts estimated that LNG would be priced at about $4 per million British thermal units (Nitrogen & Methanol, 2004).

If natural gas prices remain high in the United States, ammonia imports through the U.S. Gulf Coast likely will become more economical than domestically produced material. U.S. ammonia imports have increased significantly during the past 5 years to 5.7 Mt of nitrogen content. Imports from Trinidad and Tobago increased by 50% since 1999, and by 2003, accounted for more than one-half of total U.S. ammonia imports. This increase resulted from the addition of more than 2 Mt/yr of production capacity in Trinidad and Tobago since 1998; an additional 640,000 t/yr of capacity was scheduled to be completed in 2005. The CIS, Estonia, and Lithuania group remains a large supplier, as does Canada. With U.S. ammonia capacity shrinking, ammonia imports were expected to continue to increase.

World ammonia production capacity increased incrementally in 2003, by expansion of current production facilities or a few new plants coming onstream. By 2009, however, significant additional capacity was expected, much of which would be concentrated in the Middle East and Asia. By 2009, the International Fertilizer Industry Association (2004b) estimated that world capacity would increase by about 11% and that Asia would have about 42% of the total, with about one-half of that capacity in China, about the same as in 2003. The Middle East, however, was expected to increase its share of world capacity to 11% in 2009 compared with 7% in 2003.

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TABLE 1
SALIENT AMMONIA STATISTICS[1, 2]

(Thousand metric tons of contained nitrogen unless otherwise specified)

	1999	2000	2001	2002	2003
United States:					
Production	12,900	11,800	9,120 r	10,100 r	8,770 p
Exports	562	662	647	437	400
Imports for consumption	3,890	3,880	4,550	4,670	5,720
Consumption, apparent[3]	16,300	14,900	13,200 r	14,500 r	14,200 p
Stocks, December 31, producers'	996 [4]	1,120 [4]	916 [4]	771 [4]	167
Average annual price, free on board Gulf Coast[5] dollars per short ton	109	169	183	137	245
Net import reliance as a percentage of apparent consumption[6]	21	21	31	30 r	42 p
Natural gas price, wellhead, average price[7] dollars per thousand cubic feet	2.19	3.69	4.12	2.95	4.98 e
World:					
Production	107,000	108,000	105,000	108,000 r	109,000 p
Trade[8]	12,000	12,700	12,600 r	12,800 r	13,800 p

eEstimated. pPreliminary. rRevised.
[1]Data are rounded to no more than three significant digits.
[2]Synthetic anhydrous ammonia, excluding coke oven byproduct; data are for calendar year and are from the U.S. Census Bureau.
[3]Calculated from production plus imports minus exports and industry stock changes.
[4]Source: The Fertilizer Institute.
[5]Source: Green Markets.
[6]Defined as imports minus exports; adjusted for industry stock changes.
[7]Source: Monthly Energy Review, U.S. Department of Energy.
[8]Source: International Fertilizer Industry Association Statistics, World Anhydrous Ammonia Trade.

TABLE 2
ANHYDROUS AMMONIA SUPPLY AND DEMAND IN THE UNITED STATES[1]

(Thousand metric tons of contained nitrogen)

	2001	2002	2003[p]
Production:			
Fertilizer:			
January-June	3,850 [r]	4,540 [r]	3,880
July-December	4,340 [r]	4,570 [r]	3,930
Total	8,190 [r]	9,110 [r]	7,810
Nonfertilizer:			
January-June	403	540 [r]	525
July-December	526	495 [r]	433
Total	929	1,040 [r]	958
Grand total	9,120 [r]	10,100 [r]	8,770
Imports for consumption:			
January-June	2,550	2,090	2,890
July-December	2,010	2,570	2,820
Total	4,550	4,670	5,720
Exports:			
January-June	392	242	234
July-December	255	195	166
Total	647	437	400
Stocks, end of period:			
January-June	972 [2]	783 [2]	217
July-December	916 [2]	771 [2]	167
Apparent consumption:[3]			
January-June	6,550 [r]	7,070 [r]	7,100
July-December	6,670 [r]	7,450 [r]	7,070
Total	13,200 [r]	14,500 [r]	14,200

[p]Preliminary. [r]Revised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Source: Green Markets.
[3]Calculated from production plus imports minus exports and industry stock changes.

Source: U.S. Census Bureau.

TABLE 3
MAJOR DOWNSTREAM NITROGEN COMPOUNDS PRODUCED IN THE UNITED STATES[1, 2]

(Thousand metric tons)

Compound	2002	2003[p]
Urea:		
January-June:		
Gross weight	3,450 [r]	3,080
Nitrogen content	1,590 [r]	1,410
July-December:		
Gross weight	3,580 [r]	3,070
Nitrogen content	1,650 [r]	1,410
Total:		
Gross weight	7,040 [r]	6,140
Nitrogen content	3,230 [r]	2,820
Ammonium phosphates:[e, 3]		
January-June:		
Gross weight	7,810 [r]	8,060
Nitrogen content	1,230 [r]	1,190
July-December:		
Gross weight	7,700 [r]	8,220
Nitrogen content	1,260 [r]	1,240
Total:		
Gross weight	15,500	16,300
Nitrogen content	2,490 [r]	2,440
Ammonium nitrate:		
January-June:		
Gross weight	3,140 [r]	2,750
Nitrogen content	1,060 [r]	931
July-December:		
Gross weight	3,190 [r]	2,940
Nitrogen content	1,080 [r]	998
Total:		
Gross weight	6,330 [r]	5,690
Nitrogen content	2,140 [r]	1,930
Nitric acid:		
January-June:		
Gross weight	3,410 [r]	3,070
Nitrogen content	749 [r]	675
July-December:		
Gross weight	3,540 [r]	3,320
Nitrogen content	778 [r]	730
Total:		
Gross weight	6,940 [r]	6,390
Nitrogen content	1,530 [r]	1,410
Ammonium sulfate:[4]		
January-June:		
Gross weight	1,240 [r]	1,270
Nitrogen content	263 [r]	270
July-December:		
Gross weight	1,340	1,240
Nitrogen content	284	264
Total:		
Gross weight	2,580 [r]	2,520
Nitrogen content	547 [r]	534

[e]Estimated. [p]Preliminary. [r]Revised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Ranked in relative order of importance by nitrogen content.

[3]Diammonium phosphate, monoammonium phosphate, and other ammonium phosphates.

[4]Excludes coke plant ammonium sulfate.

Source: U.S. Census Bureau, Current Industrial Reports MQ325B.

TABLE 4
DOMESTIC PRODUCERS OF ANHYDROUS AMMONIA IN 2003[1]

(Thousand metric tons per year of ammonia)

Company	Location	Capacity[2]
Agrium Inc.	Borger, TX	490
Do.	Finley, WA[3]	180
Do.	Kenai, AK	1,250
Air Products and Chemicals Inc.	Pace Junction, FL	78
CF Industries Inc.	Donaldsonville, LA	2,000
Cherokee Nitrogen Div. of LSB Industries Inc.	Cherokee, AL	175
Coastal Oyster Creek Chemical	Freeport, TX[4]	204
Dyno Nobel ASA	Cheyenne, WY[5]	174
Do.	St. Helens, OR[5]	101
Dakota Gasification Co.	Beulah, ND	363
Farmland Industries Inc.	Coffeyville, KS[6]	350
Green Valley Chemical Corp.	Creston, IA	32
Honeywell International Inc.	Hopewell, VA	409
IMC-Agrico Co.	Faustina (Donaldsonville), LA	508
Koch Nitrogen Co.	Beatrice, NE[7]	272
Do.	Dodge City, KS[7]	281
Do.	Enid, OK[7]	907
Do.	Fort Dodge, IA[7]	339
Do.	Sterlington, LA	1,110
MissChem Nitrogen LLC[8]	Yazoo City, MS	621
Nitromite Fertilizer	Dumas, TX	128
PCS Nitrogen Inc.	Augusta, GA	680
Do.	Geismar, LA	491
Do.	Lima, OH	525
Do.	Woodstock, TN[4]	372
Royster-Clark Inc.	East Dubuque, IL	278
Shoreline Chemical	Gordon, GA	31
Terra Industries Inc.	Beaumont, TX	231
Do.	Blytheville, AR	381
Do.	Port Neal, IA	336
Do.	Verdigris, OK	953
Do.	Woodward, OK	399
Triad Nitrogen LLC[8]	Donaldsonville (Ampro), LA	478
Do.	Donaldsonville (Triad), LA	422
Total		15,500

[1]Data are rounded to no more than three significant digits; may not add to total shown.
[2]Engineering design capacity adjusted for 340 days per year of effective production capability.
[3]Idle since January 2001.
[4]Closed in 2003.
[5]Purchased from El Paso Corp. in December 2003.
[6]At yearend 2003, sale was pending to Pegasus Partners II LP.
[7]Purchased from Farmland Industries Inc. in May 2003.
[8]Wholly owned subsidiary of Mississippi Chemical Corp.

TABLE 5
U.S. NITROGEN FERTILIZER CONSUMPTION, BY PRODUCT TYPE[1, 2]

(Thousand metric tons of nitrogen)

Fertilizer material[3]	2002	2003[p]
Single-nutrient:		
Anhydrous ammonia	2,880	2,840
Nitrogen solutions[4]	2,530	2,590
Urea	2,210	2,230
Ammonium nitrate	483	469
Ammonium sulfate	200	214
Aqua ammonia	51	73
Other[5]	343	389
Total	8,690	8,810
Multiple-nutrient[6]	2,270	3,970
Grand total	11,000	12,800

[p]Preliminary.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Fertilizer years ending June 30.
[3]Ranked in relative order of importance by product type.
[4]Principally urea-ammonium nitrate solutions, 29.9% nitrogen.
[5]Includes other single-nutrient nitrogen materials, all natural organics, and statistical discrepencies.
[6]Various combinations of nitrogen (N), phosphate (P), and potassium (K): N-P-K, N-P, and N-K.

Source: Commercial Fertilizers 2003. Prepared as a cooperative effort by The Fertilizer Institute and the Association of American Plant Food Control Officials.

TABLE 6
U.S. PRODUCER STOCKS OF FIXED NITROGEN COMPOUNDS AT END OF PERIOD[1]

(Thousand metric tons of nitrogen)

Material[2]	2002	2003[p]
Ammonia:		
January-June	783 [3]	218
July-December	771 [3]	167
Nitrogen solutions:[4]		
January-June	98 [r]	83
July-December	116 [r]	84
Urea:		
January-June	60 [r]	78
July-December	68 [r]	56
Ammonium phosphates:[5]		
January-June	42 [r]	79
July-December	75 [r]	47
Ammonium nitrate:		
January-June	44 [r]	44
July-December	66 [r]	55
Ammonium sulfate:		
January-June	30	20
July-December	43 [r]	25
Yearend total[6]	1,140 [r]	434

See footnotes at end of table.

TABLE 6--Continued
U.S. PRODUCER STOCKS OF FIXED NITROGEN
COMPOUNDS AT END OF PERIOD[1]

[p]Preliminary. [r]Revised.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Ranked in relative order of importance.
[3]Source: The Fertilizer Institute.
[4]Urea-ammonium nitrate and ammoniacal solutions.
[5]Diammonium and monoammonium phosphates.
[6]Calendar year ending December 31.

Source: U.S. Census Bureau, Current Industrial Reports MQ325B.

TABLE 7
PRICE QUOTATIONS FOR MAJOR NITROGEN COMPOUNDS AT END OF PERIOD

(Dollars per short ton)

Compound	2002		2003	
	June	December	June	December
Ammonium nitrate, free on board (f.o.b.) Corn Belt[1]	125-135	120-130	170-180	190-195
Ammonium sulfate, f.o.b. Corn Belt[1]	130-135	120-130	137-145	135-140
Anhydrous ammonia:				
F.o.b. Corn Belt[1]	181-190	233-245	275-290	315-330
F.o.b. Gulf Coast[2]	140	170-175	250	290
Diammonium phosphate, f.o.b. central Florida	141-143	134-138	158-160	185-195
Urea:				
F.o.b. Corn Belt[1], prilled and granular	130-140	150-160	180-195	215-225
F.o.b. Gulf Coast, granular[2]	124-125	128-132	162-167	192-195
F.o.b. Gulf Coast, prilled[2]	121	125	NA	NA

NA Not available.
[1]Illinois, Indiana, Iowa, Missouri, Nebraska, and Ohio.
[2]Barge, New Orleans.

Source: Green Markets.

TABLE 8
U.S. EXPORTS OF ANHYDROUS AMMONIA, BY COUNTRY[1]

(Thousand metric tons of ammonia)

Country	2002	2003
Canada	7	18
Korea, Republic of	468	416
Mexico	3	37
Philippines	23	--
Taiwan	24	11
Other	7	5
Total	532	487

-- Zero.
[1]Value data suppressed by U.S. Census Bureau.

Source: U.S. Census Bureau.

TABLE 9
U.S. IMPORTS OF ANHYDROUS AMMONIA, BY COUNTRY[1]

(Thousand metric tons of ammonia and thousand dollars)

Country	2002		2003	
	Gross weight	Value[2]	Gross weight	Value[2]
Argentina	31	4,100	52	12,800
Brazil	81	9,720	52	10,200
Canada	1,070	163,000	1,120	249,000
Colombia	42	5,270	6	1,000
France	--	--	5	969
Indonesia	13	1,560	21	5,510
Italy	--	--	(3)	15
Japan	1	102	--	--
Latvia	25	3,240	87	20,200
Mexico	73	9,240	--	--
Netherlands	--	--	6	1,170
Qatar	--	--	35	7,220
Russia	856 r	114,000 r	1,450	309,000
Saudi Arabia	--	--	88	22,200
Trinidad and Tobago	2,950	380,000	3,680	777,000
Ukraine	117 r	16,600 r	109	21,000
United Kingdom	--	--	(3)	11
Venezuela	419	55,000	240	53,100
Total	5,680	763,000	6,950	1,490,000

rRevised. -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, and freight value.
[3]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF MAJOR NITROGEN COMPOUNDS[1]

(Thousand metric tons)

Compound	2002		2003		Principal destinations, 2003
	Gross weight	Nitrogen content	Gross weight	Nitrogen content	
Ammonium nitrate[2]	98	33	52	18	Mexico, 83%; Canada, 13%.
Ammonium sulfate[2]	874	236	868	234	Brazil, 65%.
Anhydrous ammonia	532	437	487	400	Republic of Korea, 85%.
Diammonium phosphate	6,820	1,230	6,210	1,120	China, 42%; India, 10%.
Monoammonium phosphate	2,210	243	2,920	322	Brazil, 29%; Australia, 22%; Canada, 22%.
Urea	963	442	876	402	Mexico, 41%; Republic of Korea, 30%; Canada, 11%.
Mixed chemical fertilizers[3]	285	34	260	31	Colombia, 29%; Mexico, 16%, Canada, 12%.
Other nitrogenous fertilizers[4]	337	100	149	44	Mexico, 26%; Japan, 10%; Canada, 9%.
Total	12,100	2,750	11,800	2,570	

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes industrial chemical products.
[3]Harmonized Tariff Schedule of the United States (HTS) codes 3105.10.0000, 3105.20.0000, and 3105.51.0000.
[4]HTS codes 3101.00.0000, 3102.29.0000, 3102.60.0000, and 3102.90.0000.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS OF MAJOR NITROGEN COMPOUNDS[1]

(Thousand metric tons and thousand dollars)

Compound	2002 Gross weight	2002 Nitrogen content	2002 Value[2]	2003 Gross weight	2003 Nitrogen content	2003 Value[2]	Principal sources, 2003
Ammonium nitrate[3]	990	336	115,000	1,200	408	166,000	Canada, 38%; Netherlands, 17%; Romania, 13%.
Ammonium nitrate-limestone mixtures	1	(4)	141	4	1	341	Japan, 78%; Netherlands, 11%.
Ammonium sulfate[3]	347	74	27,400	283	60	28,500	Canada, 88%.
Anhydrous ammonia[5]	5,680	4,670	763,000	6,950	5,720	1,490,000	Trinidad and Tobago, 53%; Russia, 21%; Canada, 16%.
Calcium nitrate	99	17	9,070	91	15	8,900	Norway, 96%.
Diammonium phosphate	156	28	32,800	142	26	30,700	Russia, 91%.
Monoammonium phosphate	229	25	46,700	164	18	41,000	Russia, 66%; Canada, 15%.
Nitrogen solutions	997	298	98,400	1,740	521	225,000	Poland, 18%; Canada, 15%; Romania, 13%; Russia, 10%.
Potassium nitrate	101	14	31,800	79	11	23,900	Chile, 79%; Denmark, 9%; Israel, 8%.
Potassium nitrate-sodium nitrate mixtures	16	2	4,820	50	8	18,000	Israel, 55%; Chile, 44%.
Sodium nitrate	77	13	12,600	88	15	17,100	Chile, 96%.
Urea	3,840	1,760	556,000	4,970	2,280	866,000	Canada, 30%; Saudi Arabia, 10%; Kuwait, 9%.
Mixed chemical fertilizers[6]	234	28	58,800	213	26	66,700	Canada, 30%; Norway, 20%; Poland, 12%.
Other nitrogenous fertilizers[7]	252	75	40,400	348	103	64,300	Norway, 68%; Bahrain, 8%.
Total	13,000	7,340	1,800,000	16,300	9,210	3,050,000	

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, and freight value.
[3]Includes industrial chemical products.
[4]Less than 1/2 unit.
[5]Includes industrial ammonia.
[6]Harmonized Tariff Schedule of the United States (HTS) codes 3105.10.0000, 3105.20.0000, 3105.51.0000, and 3105.90.0050.
[7]HTS codes 3101.00.0000, 3102.29.0000, 3102.60.0000, and 3102.90.0000.

Source: U.S. Census Bureau.

TABLE 12
AMMONIA: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons of contained nitrogen)

Country	1999	2000	2001	2002	2003
Afghanistan[e]	5	20	20	20	20
Albania[e]	10	10	10	10	10
Algeria	455	458	469	563	578
Argentina	88	199	597	617	724
Australia	431	576	762	686	787
Austria[e]	450	450	440	440	440
Bahrain	370	350	372	377	312
Bangladesh[3]	1,240	1,255	1,273	1,289	1,389
Belarus	765	730	725	760	765 [e]
Belgium	840	863	788	842	874
Bosnia and Herzegovina[e]	1	1	1	1	1
Brazil	1,084	925	769	1,021	939
Bulgaria	315	533	477	328	321
Burma	66	78	28	21	63
Canada	4,135	4,130	3,439	3,594	3,646
China	28,300	27,700	28,200	30,100 [e]	30,200
Colombia	75	93	95	111 [r]	111 [e]
Croatia	318	325	259	235	264
Cuba[e]	135	135	135	135	135
Czech Republic	223	246	206	215	235 [e]
Denmark[e]	2	2	2	2	2
Egypt	1,407	1,511	1,801	1,839	1,790

See footnotes at end of table.

TABLE 12--Continued
AMMONIA: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons of contained nitrogen)

Country	1999	2000	2001	2002	2003
Estonia	164	145	151	39	81 e
Finland[e]	60 r	75 r, 4	80 r	60 r	60
France[e]	1,580	1,620	1,380	1,172 r, 4	1,153
Germany	2,406	2,599	2,522	2,560	2,803
Georgia	104	135	60	90	125
Greece	160	121	57	66	123
Hungary	261	352	324	238	232
Iceland	7 e	7 e	3	--	--
India[5]	10,376	10,148	10,081	9,827	9,708
Indonesia	3,450	3,620	3,655	4,200	4,250
Iran	865	965	1,087	1,119	1,115
Iraq[e]	220	200	280 r	532 r	--
Ireland	405	410	443	400 e	--
Italy	367	408	434	391	475
Japan	1,385	1,410	1,318	1,188	1,054
Korea, North[e]	100	100	100	100	100
Korea, Republic of	489	369	368	153	119
Kuwait	397	410	400	414	444 e
Libya	552	552	495	533	577 e
Lithuania	401	420	440	467	461
Malaysia	432	605	726	848	910
Mexico	1,003	701	548	537	440
Netherlands[e]	2,430	2,540	1,990 r	2,050 r	1,750
New Zealand	110	105	117	109	128
Nigeria[e]	148	--	--	--	--
Norway	122	334	323	330	354
Pakistan	1,999	1,884	2,228 r	2,214 r	2,357
Peru[e]	--	--	5	5	5
Poland	1,474	1,862	1,735	1,311	1,906
Portugal	223	246	202	190	245
Qatar	1,130	1,097	1,159	1,195 r	1,195
Romania	686	1,016	949	930	1,180
Russia	7,633	8,735	8,690	8,600 e	9,100 e
Saudi Arabia	1,402	1,743	1,774	1,737	1,743
Serbia and Montenegro	57	60 e	66	115	62
Slovakia	247	271	215	226	230
South Africa	785	560	506	492	493
Spain	437	442	436	415	432
Switzerland	32	33	31	33	29
Syria	112	91	138	143	161
Taiwan	146	11	--	--	--
Tajikistan[e]	10	15	5	15	20
Trinidad and Tobago	2,720	2,680	3,036	3,296 r	3,574
Turkey	82	53	67	301	289
Turkmenistan[e]	75	75	75	85 r	85
Ukraine	3,711	3,577	3,700	3,700	3,900 e
United Arab Emirates	380	348	358	364	421 e
United Kingdom	902	814	850	837	1,044
United States[6]	12,900	11,800	9,120 r	10,100 r	8,770 p
Uzbekistan	790	810	670	740	815 e
Venezuela	522	423	808	606 r	732 e
Vietnam	33 e	42	53	58	80 e
Zimbabwe[e]	61	58	58	61	55
Total	107,000	108,000	105,000	108,000 r	109,000

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data have been rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through June 18, 2004.

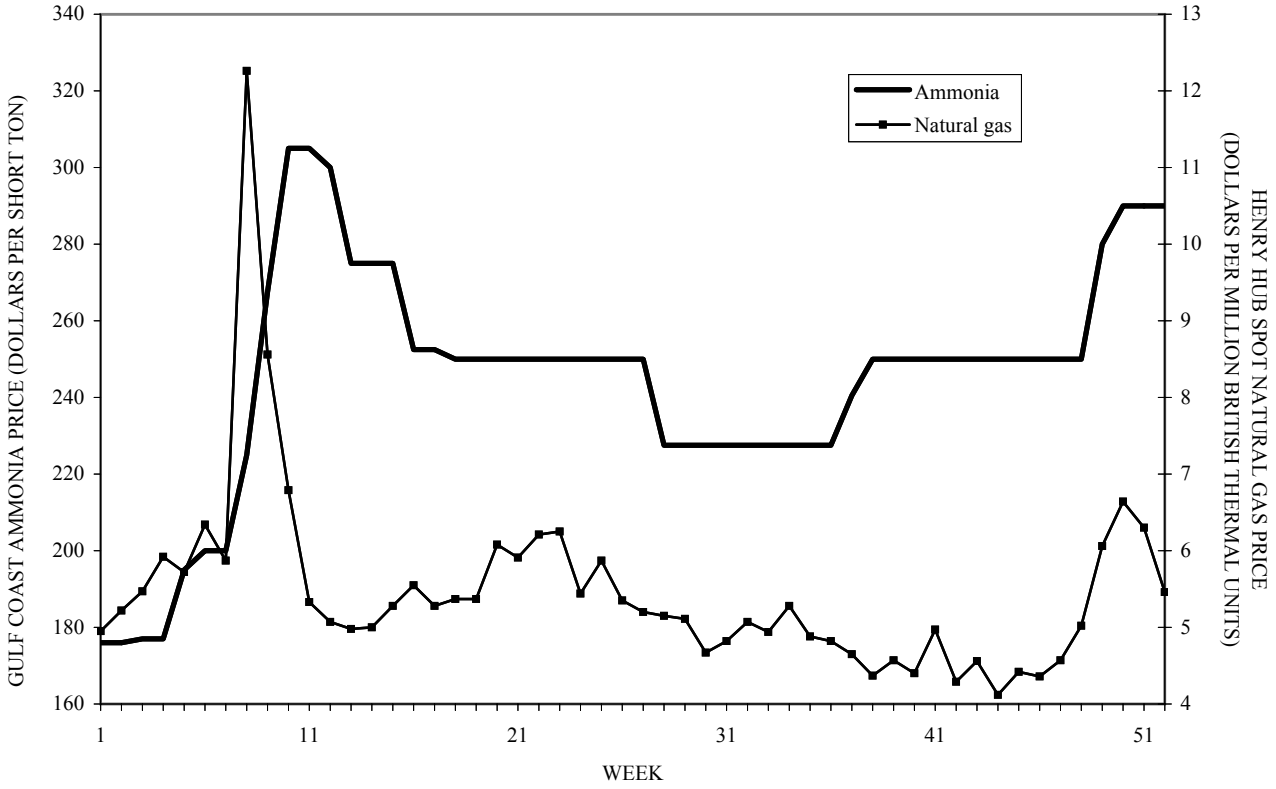
[3]May include nitrogen content of urea.

[4]Reported figure.

[5]Data are for years beginning April 1 of that stated.

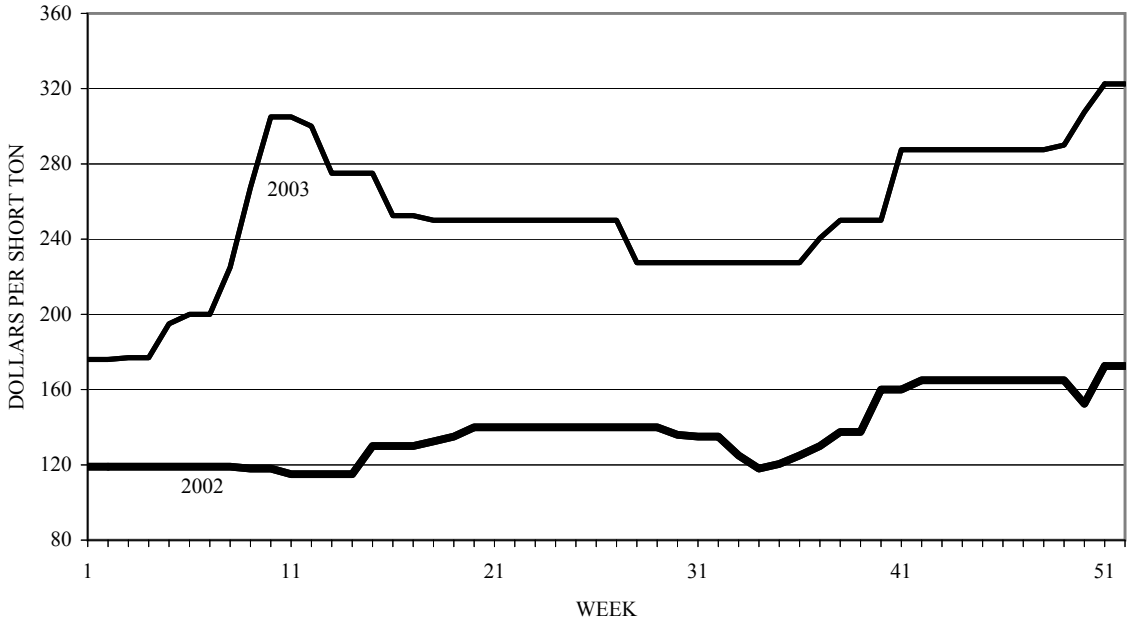
[6]Synthetic anhydrous ammonia; excludes coke oven byproduct ammonia.

FIGURE 1
AMMONIA AND NATURAL GAS PRICES IN 2003



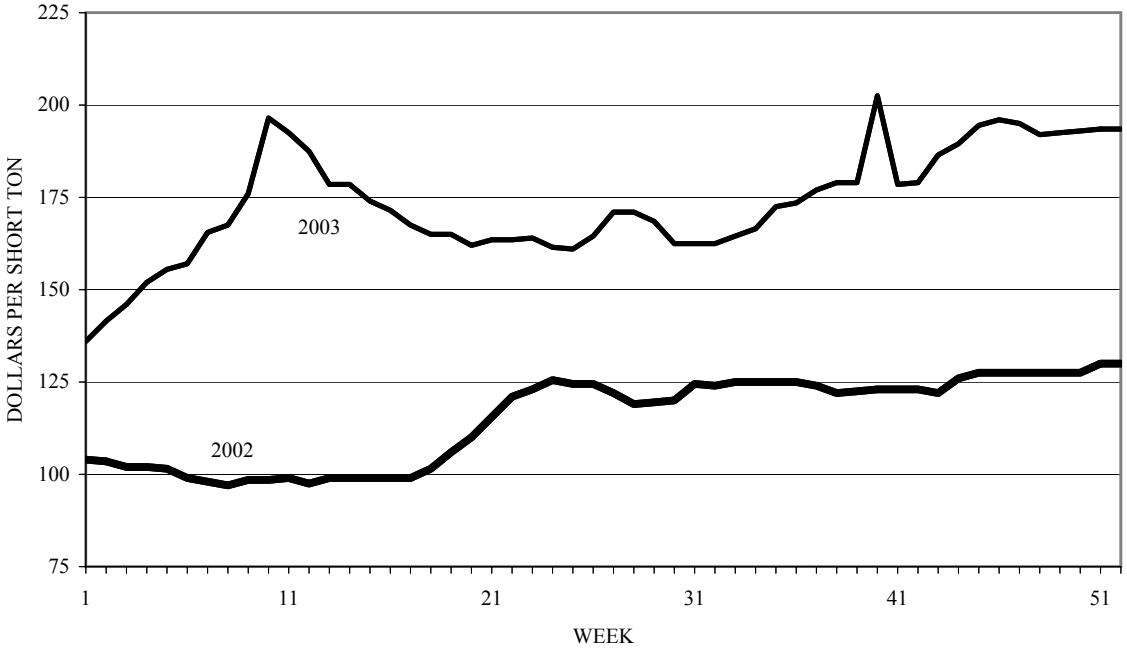
Sources: Green Markets and Natural Gas Weekly.

FIGURE 2
AVERAGE GULF COAST AMMONIA PRICES



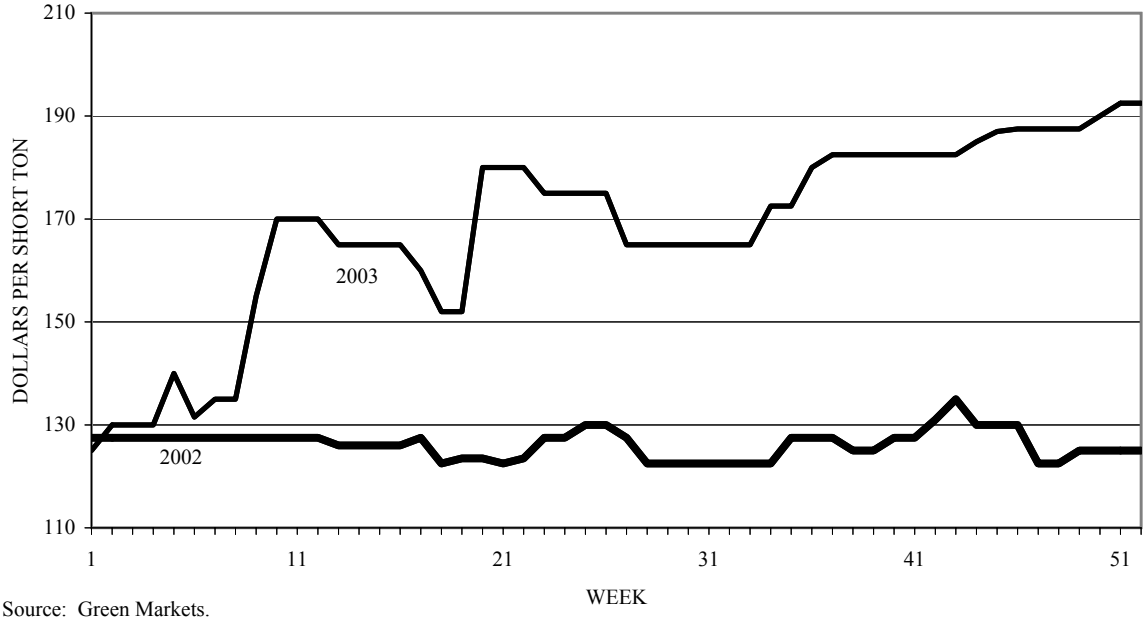
Source: Green Markets.

FIGURE 3
AVERAGE GULF COAST GRANULAR UREA PRICES



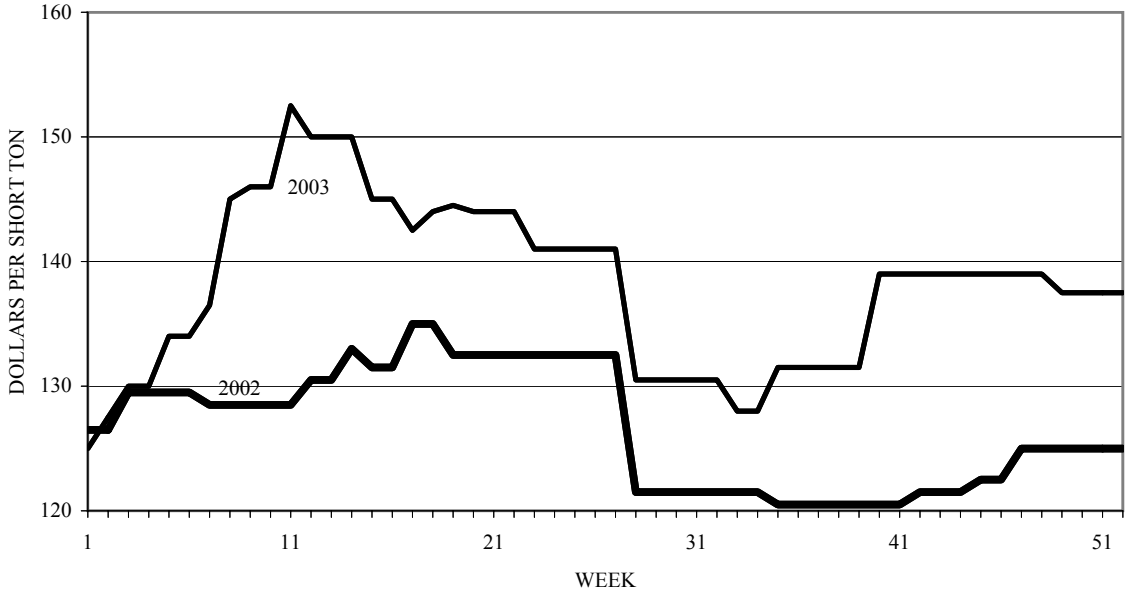
Source: Green Markets.

FIGURE 4
AVERAGE AMMONIUM NITRATE PRICES



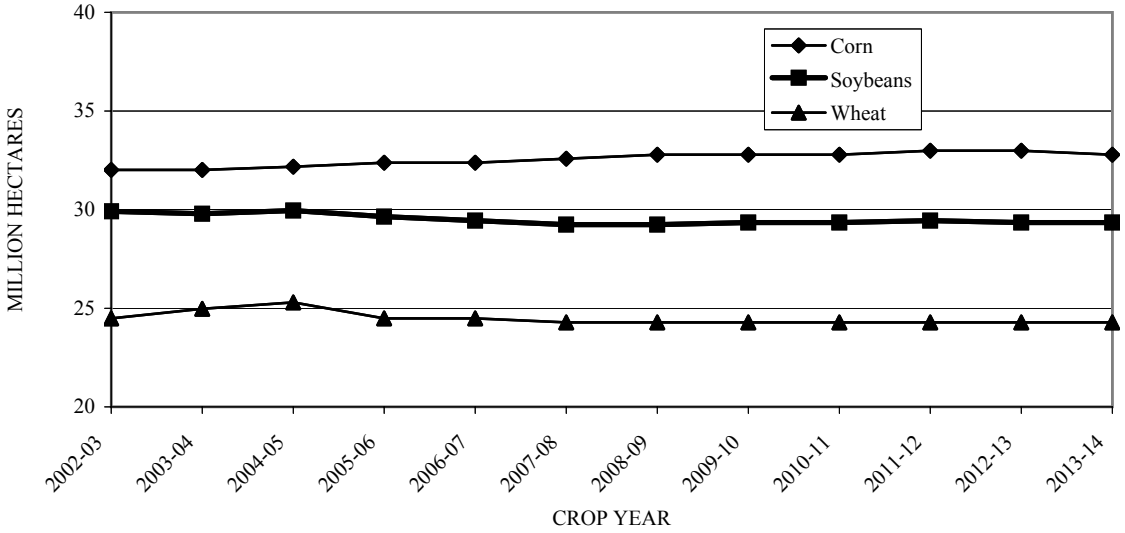
Source: Green Markets.

FIGURE 5
AVERAGE AMMONIUM SULFATE PRICES



Source: Green Markets.

FIGURE 6
PROJECTED PLANTED ACREAGE



Source: U.S. Department of Agriculture.