PHOSPHATE ROCK

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Phosphate rock ore was mined by nine firms in four States, and upgraded to an estimated 34.2 million tons of marketable product valued at $855 million, f.o.b. mine. Florida and North Carolina accounted for 85% of total domestic output, with the remainder produced in Idaho and Utah. More than 90% of the U.S. phosphate rock ore mined was used to manufacture wet-process phosphoric acid and superphosphoric acid, which were used as intermediates in the manufacture of granular and liquid ammonium phosphate fertilizers and animal feed supplements. More than 50% of the wet-process phosphoric acid produced was exported in the form of upgraded granular diammonium and monoammonium phosphate fertilizer, triple superphosphate fertilizer, and merchant grade phosphoric acid. Phosphate rock mined by two companies in Idaho was consumed as feedstock for elemental phosphorus production at two wholly owned electric furnace facilities. Elemental phosphorus was used to produce high-purity phosphoric acid and phosphorus compounds, which were used in a variety of industrial and food-additive applications.

Salient Statistics—United States:	1997	1998	1999	2000	2001[e]
Production, marketable	45,900	44,200	40,600	38,600	34,200
Sold or used by producers	42,100	43,700	41,600	37,400	32,500
Imports for consumption	1,830	1,760	2,170	1,930	2,000
Exports	335	378	272	299	50
Consumption[1]	43,600	45,000	43,500	39,000	34,500
Price, average value, dollars per ton, f.o.b. mine[2]	24.40	25.46	30.56	24.14	25.00
Stocks, producer, yearend	7,910	7,920	6,920	8,170	9,400
Employment, mine and beneficiation plant, number[e]	7,500	7,700	7,200	6,300	6,000
Net import reliance[3] as a percentage of apparent consumption	—	3	7	1	2

Recycling: None.

Import Sources (1997-2000): Morocco, 99%; and other, 1%.

Tariff: Item	Number	Normal Trade Relations 12/31/01
Natural calcium phosphates:		
Unground	2510.10.0000	Free.
Ground	2510.20.0000	Free.

Depletion Allowance: 14% (Domestic), 14% (Foreign).

Government Stockpile: None.

Events, Trends, and Issues: With more than 90% of all phosphate rock mined the United States consumed for fertilizer and animal feed supplements, agricultural demand dictates the direction of the industry. Producers in Florida and North Carolina, which are heavily dependent on exports sales of fertilizers, continued to be affected by the downturn in the world phosphate market that began in 1999. Domestic consumption of phosphate fertilizer fell by 4.4% in 2001 owing to reduced acreage planted, lower application rates, low crop prices, and higher input costs. The combination of these factors caused estimated domestic production, sales, and use of phosphate rock to reach their lowest points since 1969 and estimated consumption was the lowest since 1986. Worldwide consumption of phosphate fertilizers was estimated to have fallen by more than 3% from 1999 to 2001. China and India have been the major destinations for U.S. exports of phosphate fertilizers in the past several years. However, since late-1999, exports to both countries have dropped substantially owing to reduced demand caused by poor weather during the planting season, high inventories, Indian Government subsidy programs, and to a lesser extent, foreign competition. In addition, new fertilizer plants that have opened in Australia and India have reduced import requirements in those countries. The weak market conditions resulted in the temporary closure of several phosphoric acid and fertilizer plants in Florida and Louisiana and reduced output from other mines and plants in the Florida and North Carolina region. U.S. Western producers were unaffected by the world problems because phosphate rock from the region was used for domestic fertilizers or elemental phosphorus for industrial applications.

A company that only produced phosphoric acid and fertilizers began permitting procedures to develop a new mine in Hardee County, FL. The proposed mine would produce about 2.7 million tons per year for 30 years, according to the

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company. The firm anticipated opening the mine in 2005, which is when its phosphate rock purchasing contract with another company in Florida expires.

One of two elemental phosphorus plants in the United States was closed at the end of 2001 to reduce operating expenditures. The company opened a new purified wet-process phosphoric acid plant in Idaho, which can manufacture high purity acid at a much lower cost than by using elemental phosphorus. Earlier in the year, three of four furnaces at the facility were closed because of the rising cost of electricity. Mine production in Idaho will not be affected, because the phosphate rock will be used at the purified acid plant. With the closure, there is only one elemental phosphorus plant in the United States. Elemental phosphorus production has decreased steadily worldwide in the past decade because of high production cost and environmental problems associated with operating the plants and increased competition from purified wet-process acid technology.

World demand for phosphate fertilizers will continue to expand in relation to increased world population and food requirements, with the largest growth occurring in developing nations. Projections by various analysts and international organizations indicate that consumption of phosphate in fertilizer could increase by nearly 5% in 2002 based upon encouraging signs in China, India, and North America. For the period 2001-05, phosphate consumption was forecasted to increase by 3.6% annually. Domestic fertilizer consumption was projected to increase by more than 3% in 2002 because of higher fertilizer application rates. The United States remains the world's largest producer of phosphate rock and processed phosphates and the leading supplier of diammonium phosphate. However, increased foreign competition has removed a significant portion of U.S. sales. Weak market conditions will likely prevail until the full impact of new plants in Asia is felt and how quickly domestic manufacturers can increase sales in other regions, especially China. Phosphate rock production is likely to remain below capacity in the Florida and North Carolina region, as companies adjust production to meet demand and prolong reserves. The several new mines that are planned to open in the next 5 years would primarily be replacements for existing mines and not have a significant impact on annual production capacity.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[4]	Reserve base[4]
	2000	2001[e]		
United States	38,600	34,200	1,000,000	4,000,000
Brazil	4,900	5,000	330,000	370,000
China	19,400	20,000	1,000,000	10,000,000
Israel	4,110	4,000	180,000	800,000
Jordan	5,510	5,500	900,000	1,700,000
Morocco and Western Sahara	21,600	22,000	5,700,000	21,000,000
Russia	11,100	10,500	200,000	1,000,000
Senegal	1,800	2,000	50,000	160,000
South Africa	2,800	2,800	1,500,000	2,500,000
Syria	2,170	2,100	100,000	800,000
Togo	1,370	800	30,000	60,000
Tunisia	8,340	8,100	100,000	600,000
Other countries	11,300	11,100	1,200,000	4,000,000
World total (rounded)	133,000	128,000	12,000,000	47,000,000

World Resources: Foreign reserve data were derived from information received from Government sources, individual companies, and independent sources. Reserve data for China were revised with data from a study prepared for a company that is developing a new mine in Hubei Province. Domestic reserve data were based on U.S. Geological Survey and individual company information. Phosphate rock resources occur principally as sedimentary marine phosphorites. The largest deposits are found in northern Africa, China, the Middle East, and the United States. Significant igneous occurrences are found in Brazil, Canada, Russia, and South Africa. Large phosphate resources have been identified on the continental shelves and on seamounts in the Atlantic Ocean and the Pacific Ocean, but cannot be recovered economically with current technology.

Substitutes: There are no substitutes for phosphorus in agriculture.

[e]Estimated. — Zero.

[1]Defined as sold or used plus imports minus exports.

[2]Marketable phosphate rock, weighted value, all grades, domestic and export.

[3]Defined as imports - exports + adjustments for Government and industry stock changes.

[4]See Appendix C for definitions.