

PHOSPHATE ROCK

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: Phosphate rock ore was mined by 6 firms at 12 mines in 4 States, and upgraded to an estimated 30.7 million tons of marketable product valued at \$852 million, f.o.b. mine. Florida and North Carolina accounted for more than 85% of total domestic output; the remainder was produced in Idaho and Utah. Marketable product refers to beneficiated phosphate rock with a phosphorus pentoxide (P₂O₅) content suitable for phosphoric acid or elemental phosphorus production. More than 95% of the U.S. phosphate rock mined was used to manufacture wet-process phosphoric acid and superphosphoric acid, which were used as intermediate feedstocks in the manufacture of granular and liquid ammonium phosphate fertilizers and animal feed supplements. Approximately 45% of the wet-process phosphoric acid produced was exported in the form of upgraded granular diammonium and monoammonium phosphate (DAP and MAP, respectively) fertilizer, merchant-grade phosphoric acid, and triple superphosphate fertilizer. The balance of the phosphate rock mined was for the manufacture of elemental phosphorus, which was used to produce phosphorus compounds for a variety of food-additive and industrial applications.

Salient Statistics—United States:	2002	2003	2004	2005	2006^e
Production, marketable	36,100	35,000	35,800	36,300	30,700
Sold or used by producers	34,700	36,400	36,500	36,000	29,900
Imports for consumption	2,700	2,400	2,500	2,630	2,300
Exports	62	64	—	—	—
Consumption ¹	37,400	37,400	39,000	38,600	32,200
Price, average value, dollars per ton, f.o.b. mine ²	27.47	27.01	27.79	27.34	27.78
Stocks, producer, yearend	8,860	7,540	7,220	6,970	7,400
Employment, mine and beneficiation plant, number ^e	2,800	2,900	2,700	2,700	2,500
Net import reliance ³ as a percentage of apparent consumption	3	9	7	7	6

Recycling: None.

Import Sources (2002-05): Morocco, 99%; and other, 1%.

Tariff: Item	Number	Normal Trade Relations 12-31-06
Natural calcium phosphates:		
Unground	2510.10.0000	Free.
Ground	2510.20.0000	Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: U.S. phosphate rock production and use dropped to 40-year lows in 2006 owing to a combination of mine and fertilizer plant closures and lower export sales of phosphate fertilizers. China has surpassed the United States as the largest phosphate rock producer. Since late 2005, two phosphate rock mines and four fertilizer plants were closed permanently and one mine was temporarily closed. Additionally, the leading U.S. producer closed its four active mines for 1 month in 2006 to reduce inventories of phosphate rock. Because of the decreased level of phosphoric acid production in 2006, consumption of phosphate rock fell to a 30-year low.

Domestic phosphate rock annual production capacity fell to under 35 million tons in 2006, the lowest level since 1969. It is likely that production capacity will continue to decline gradually owing to depletion of reserves in Florida and increased global competition in the fertilizer industry, which may result in lower domestic phosphoric acid production. Three new mines are planned to open in the next decade in Florida, but only as replacements for existing mines.

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The United States remained the world's leading consumer, producer, and supplier of phosphate fertilizers; however, its share of the world market has been shrinking. Phosphate fertilizer production increasingly is being located in the large consuming regions of Asia and South America, reducing the need for imported fertilizers to these regions. U.S. exports of phosphate fertilizer to China and India, the two largest consumers of phosphate fertilizers, have dropped significantly since 2000. Exports of DAP to India have rebounded slightly over the past 2 years owing to temporary plant closures in India and increased consumption, but have not returned to the record level of 1999. Exports of MAP to Brazil have increased over the past several years, but declined in 2005-06 owing to lower demand. Domestic consumption of phosphate fertilizers was expected to remain around 4 million tons P_2O_5 .

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁴	Reserve base ⁴
	2005	2006 ^e		
United States	36,300	30,700	1,200,000	3,400,000
Australia	2,050	2,050	77,000	1,200,000
Brazil	6,100	5,500	260,000	370,000
Canada	1,000	1,000	25,000	200,000
China	30,400	32,000	6,600,000	13,000,000
Egypt	2,730	2,740	100,000	760,000
Israel	2,900	3,000	180,000	800,000
Jordan	6,230	6,400	900,000	1,700,000
Morocco and Western Sahara	25,200	25,300	5,700,000	21,000,000
Russia	11,000	11,000	200,000	1,000,000
Senegal	1,520	1,500	50,000	160,000
South Africa	2,580	2,600	1,500,000	2,500,000
Syria	3,500	3,600	100,000	800,000
Togo	1,220	1,200	30,000	60,000
Tunisia	8,000	8,400	100,000	600,000
Other countries	6,500	6,700	890,000	2,200,000
World total (rounded)	147,000	145,000	18,000,000	50,000,000

World Resources: Foreign reserve data were derived from information received from Government sources, individual companies, and independent sources. Reserve data for China were based on official government data and included deposits of low-grade ore. Production data for China does not include small "artisanal" mines. 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 sedimentary 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.

^eEstimated. — Zero.

¹Defined as sold or used + imports – exports.

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

³Defined as imports – exports + adjustments for Government and industry stock changes.

⁴See Appendix C for definitions.