

PHOSPHATE ROCK

(Data in thousand metric tons, unless otherwise noted)

Domestic Production and Use: Phosphate rock ore was mined by 10 firms in 4 States, and upgraded into an estimated 46.5 million metric tons of marketable product valued at about \$1,100 million f.o.b. mine. Florida and North Carolina accounted for about 85% of total domestic output, with the remainder produced in southeastern Idaho and northwestern Utah. Approximately 90% of U.S. phosphate rock demand was for conversion into wet-process phosphoric acid and superphosphoric acid, which are used principally as intermediates in the manufacture of granular and liquid ammonium phosphate fertilizers for domestic consumption and export. The remainder of the phosphate rock was used in industrial applications or was exported. About 50% of U.S. wet-process phosphoric acid production was consumed for exports in the form of upgraded granular diammonium and monoammonium phosphate fertilizer materials, triple superphosphate fertilizer, and merchant grade phosphoric acid. Calcium phosphate animal feed supplements, essential to livestock nutrition, were derived from defluorinated phosphoric acid and defluorinated phosphate rock, while purified phosphoric acid was used in a variety of industrial applications. Phosphate rock was mined by three western firms as feedstock for high-purity, industrial-grade elemental phosphorus manufacture in wholly owned electric furnace facilities in Idaho and Montana.

Salient Statistics—United States:	1993	1994	1995	1996	1997^e
Production ¹	35,500	41,100	43,500	45,400	46,300
Sold or used by producers	40,100	43,900	43,700	43,500	41,300
Imports for consumption	534	620	1,080	1,800	1,800
Exports	3,200	2,800	2,990	² 1,570	² 600
Consumption ³	38,300	42,900	42,000	43,700	42,500
Price, average value, dollars per ton, f.o.b. mine ⁴	21.38	21.14	21.75	23.40	23.70
Stocks, producer, yearend	9,220	5,980	5,710	6,390	8,600
Employment, mine and beneficiation plant, number	5,600	5,000	5,000	5,000	5,000
Net import reliance ⁵ as a percent of apparent consumption	4	5	E	E	E

Recycling: None. Limited to phosphate rock conversion products.

Import Sources (1993-96): Morocco, 99%; and other, 1%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN⁶ 12/31/97
Natural calcium phosphates:			
Unground	2510.10.0000	Free	Free.
Ground	2510.20.0000	Free	Free.

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

Government Stockpile: None.

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Events, Trends, and Issues: Consolidation of the U.S. phosphate fertilizer industry continued with two U.S. companies expected to merge at the end of the year. One of the companies involved in the merger closed three mines in 1997, two temporarily and one permanently. The same company exchanged phosphate reserves with another Florida phosphate company. Another Florida phosphate fertilizer producer's plans to reopen a closed fertilizer plant were delayed due to permitting problems for improvements to its sulfuric acid plant.

A Canadian company announced plans to develop a phosphate deposit in Ontario and to upgrade its phosphate processing plant in Alberta. The company was considering the development of another unspecified deposit. A joint venture between the Government-owned Moroccan phosphate company and an Indian company will increase phosphoric acid production in Morocco. Two-thirds of the new production would be dedicated to meet the needs of the Indian partner.

Corn yields in the United States were projected to be lower than in 1996, causing industry analysts to predict increased fertilizer demand for 1998 to attempt to improve yields and raise grain stocks. Increased domestic fertilizer demand and continuing strength in fertilizer exports should result in another good year for phosphate producers in 1998. Imported fertilizers will continue to play a major role in meeting the plant nutrient needs in China and India with U.S. phosphate producers continuing to play a major role in supplying those needs.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁷	Reserve base ⁷
	1996	1997 ^e		
United States	45,400	46,300	1,200,000	4,400,000
Brazil	3,600	4,000	330,000	370,000
China	21,000	22,000	210,000	210,000
Israel	3,800	3,900	180,000	180,000
Jordan	5,350	5,500	90,000	570,000
Kazakstan	500	500	—	100,000
Morocco and Western Sahara	20,800	21,000	5,900,000	21,000,000
Russia	8,500	8,500	—	1,000,000
Senegal	1,600	1,600	—	160,000
South Africa	2,700	2,700	2,500,000	2,500,000
Togo	2,600	2,600	—	60,000
Tunisia	7,100	7,200	—	270,000
Other countries	<u>10,100</u>	<u>10,000</u>	<u>1,000,000</u>	<u>2,500,000</u>
World total (rounded)	133,000	136,000	11,000,000	33,000,000

World Resources: Phosphate rock resources occur principally as sedimentary marine phosphorites. Significant igneous occurrences are found in Russia and South Africa. Large phosphate resources have been identified on the continental shelves and on seamounts in the Atlantic and Pacific Oceans.

Substitutes: There are no substitutes for phosphorus in agriculture.

^eEstimated. E Net exporter.

¹Marketable.

²Source: Bureau of the Census.

³Defined as sold or used + imports - exports.

⁴Marketable phosphate rock, weighted value, all grades, domestic and export.

⁵Defined as imports - exports + adjustments for Government and industry stock changes.

⁶See Appendix B.

⁷See Appendix D for definitions.