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2005 Minerals Yearbook

PHOSPHATE ROCK

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PHOSPHATE ROCK

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In 2005, U.S. marketable phosphate rock production increased to 36.3 million metric tons (Mt) from 35.8 Mt in 2004 (tables 1, 3). U.S. production capacity was 40 Mt, which was slightly lower than in 2004 owing to the closure of two mines (table 12). More than 90% of phosphate rock consumed was used to manufacture wet-process phosphoric acid for use in fertilizer products. The remainder was used for animal feed supplements, direct application to soil, and production of elemental phosphorus. World production was higher than in 2004 (table 13). The United States remained the world's leading producer, consumer, and importer of phosphate rock and the leading producer and supplier of phosphate fertilizers.

Phosphorus is an essential element for plant and animal nutrition and is consumed primarily as a principal component of nitrogen-phosphorus-potassium (NPK) fertilizers. Phosphate rock minerals are the only significant global resources of phosphorus. In this report (unless otherwise noted), mine production is reported in terms of marketable production, which refers to beneficiated phosphate rock with a suitable phosphorus pentoxide (P_2O_5) content for wet-process phosphoric acid or elemental phosphorus manufacturing. Percentages have been calculated using unrounded data.

Domestic Data Coverage

U.S. Geological Survey (USGS) domestic phosphate rock production data were obtained from monthly and semiannual voluntary canvasses of all companies that owned phosphate rock mines. All companies responded to the canvass in 2005. There were 14 active phosphate rock mines during the year; one mine, however, closed permanently in September, leaving 13 active mines at the end of the year (table 2).

Production

In 2005, phosphate rock was produced at nine mines in Florida, three in Idaho, and one each in North Carolina and Utah (table 2).

In Florida, the phosphate industry is concentrated in the counties of Hamilton, Hardee, Hillsborough, Manatee, and Polk. The nine mines that were active in the State in 2005 represented 72% of domestic annual production capacity. The Mosaic Company operated seven mines, and CF Industries, Inc. and PCS Phosphate Co., Inc. each operated one (table 2). In addition, PCS has a large integrated production facility in Beaufort County, NC, that includes a mine and animal feed, fertilizer, and phosphoric acid plants. All phosphate rock mining companies are vertically integrated with one or more fertilizer plants, usually located near the mine. Mosaic was the leading producing company with more than 50% of domestic phosphoric acid production capacity.

In September, Mosaic closed its Kingsford Mine in Polk County because of depleted reserves. The closure of the 40-year-old mine resulted in the elimination of 275 jobs. Mosaic also temporarily closed all its mines for 1 week in late November 2005 and from December 23, 2005, to January 3, 2006, to reduce inventory of phosphate rock that had accumulated owing to reduced production of phosphoric acid (Maready, 2005§[1]).

Mosaic ended its phosphate rock supply contract with U.S. Agri-Chemicals (USAC) (a subsidiary of Sinochem Corporation of China) in October. Mosaic had been supplying USAC 1.8 million metric tons per year (Mt/yr) of phosphate rock for phosphoric acid production at USAC's Fort Meade, FL, plant since 1994. USAC closed the plant and the associated Bartow, FL, facility that manufactured DAP and MAP after stocks of phosphate rock and phosphoric acid were exhausted in November (Mosaic Company, The, 2005b).

In the Western Phosphate Field, which is located in Idaho, Montana, Utah, and Wyoming, four mines were active in 2005—three in Idaho, and one in Utah (table 2). In Idaho, phosphate rock was mined in Caribou County by Nu-West Industries, Inc. (a subsidiary of Agrium Inc., Calgary, Alberta, Canada), P4 Production, LLC (a subsidiary of Monsanto Co.), and J.R. Simplot Co. Simplot also operated the Vernal Mine in Uintah County, UT.

Consumption

Domestic consumption of phosphate rock decreased slightly to 38.6 Mt from 39 Mt in 2004 (table 1). Phosphate rock sold and/or used as reported by the mining companies decreased slightly to 36 Mt from 36.5 Mt in 2004 (tables 1, 4). Consumption by grade and by region was withheld to avoid disclosing company proprietary data.

Phosphate rock was used primarily for production of wet-process phosphoric acid for fertilizer applications, which accounted for more than 90% of domestic consumption. The remainder was used in the manufacturing of animal feed supplements, for direct application to soil, and for elemental phosphorus production. According to the U.S. Census Bureau, production of phosphoric acid increased slightly to 11.6 Mt P_2O_5 content in 2005 from 11.5 Mt P_2O_5 content in 2004. Combined production of all types of phosphate fertilizers was 5% lower than in 2004. The major fertilizer products manufactured from phosphoric acid were diammonium phosphate (DAP) and monoammonium phosphate (MAP) (U.S. Census Bureau, 2006).

In 2005, Mosaic operated five wet-process phosphoric acid and fertilizer plants in Florida and one in Louisiana. In addition, Mosaic sold phosphate rock to USAC until it terminated their

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

sales agreement (Mosaic Company, The, 2006, p. 7). PCS had phosphoric acid and fertilizer production facilities near its mines in Florida and North Carolina. Simplot sent phosphate concentrate by a slurry pipeline; ore from its Smoky Canyon Mine in eastern Idaho went to Pocatello, ID, and ore from the Vernal Mine went to Rock Springs, WY.

Three companies—Agrifos Fertilizer LLC, Pasadena, TX; Mississippi Phosphates Corporation, Pascagoula, MS; and PCS Nitrogen, Inc., Geismar, LA—manufactured wet-process phosphoric acid using imported phosphate rock from Morocco. Agrifos and Mississippi Phosphates produced phosphate fertilizer products for domestic and export markets. PCS sold its phosphoric acid to Innophos, Inc., which has a nearby facility for upgrading phosphoric acid into high-purity acid for technical- and food-grade applications (Innophos, Inc., 2006, p. 9).

The Mississippi Phosphates facility suffered major damage from Hurricane Katrina, which made landfall west of Pascagoula, MS, on August 29. Flooding resulting from by the storm surge caused damage to electrical and instrumentation systems as well as to 25,000 metric tons (t) of DAP. In addition, a primary cooling tower was destroyed, and several buildings were damaged (Mississippi Phosphates Corporation, 2005). The plant reopened in February 2006 (Green Markets, 2006a). Mosaic experienced minor damage from the hurricane to its Louisiana facilities. The closure of oil refineries along the coast after the hurricane, however, resulted in a shortage of sulfur to phosphoric acid plants along the Gulf Coast for several weeks (Mosaic Corporation, The, 2005a).

Monsanto Company operated the only elemental phosphorus plant in the United States in Soda Springs, ID. The company used elemental phosphorus primarily to manufacture phosphorus trichloride, which was used as a chemical intermediary for the production of glyphosate-base herbicides (Monsanto Company, 2005, p. 10). In other countries, elemental phosphorus is used chiefly to manufacture high-purity phosphoric acid, by burning the phosphorus in water, which is known as thermal acid. Worldwide, there has been a gradual shift to manufacture high-purity phosphoric acid from wet-process acid, which has lower operating costs and none of the hazardous waste disposal issues that are associated with elemental phosphorus. Thermal acid, however, still accounts for 65% of annual world production capacity of high-purity phosphoric acid. China is the leading producer of elemental phosphorus in the world, with about 45 companies, most producing less than 10,000 metric tons per year (t/yr) of P_2O_5 (Jiang, 2006). The only other operating elemental phosphorus facilities in the world are located in Kazakhstan and the Netherlands (Duley, undated §).

Astaris LLC (a joint venture between Solutia, Inc. and FMC Corp.) was purchased by Israel Chemicals Ltd. (ICL) in September. Astaris and ICL were leading world producers of high-purity phosphoric acid and phosphorus chemicals for nonfertilizer applications. Astaris previously operated an elemental phosphorus plant that was closed in 2001 and a purified phosphoric acid plant that was sold and closed in 2003. After the sale, ICL had production facilities in North America and South America in addition to plants in China, Europe, and Israel (Taylor, 2005§).

The United States is considered a mature market for phosphate fertilizers, with an average consumption of slightly more than 4 Mt/yr during the past decade. In 2005, domestic consumption of P_2O_5 contained in fertilizers was 4.21 Mt, 4% less than 2004. Consumption of all types of primary nutrients (NPK) contained in fertilizers combined fell by 5% (Terry and Kirby, 2006, p. 6).

Stocks

Stocks of phosphate rock that were held by producers on December 31 fell by 3% compared with those of 2004. Data for the two regions were consolidated to avoid disclosing company proprietary information (tables 1, 3).

Transportation

In Florida and North Carolina, crude phosphate rock ore was sent by a slurry pipeline from the mines to the processing plants. Most beneficiated phosphate rock was used internally to manufacture wet-process phosphoric acid; the beneficiated phosphate rock was sent by conveyers to acid plants. The small amount of phosphate rock that was sold was delivered by rail. Mosaic sent beneficiated phosphate rock by rail to the Port of Tampa and then by barge across the Gulf of Mexico to its facilities in Louisiana. In central Florida, animal feed products, fertilizers, and phosphoric acid were sent by rail to domestic customers or to the Port of Tampa for export. The Port of Tampa handles the largest volume of fertilizer materials in the world (Tampa Port Authority, 2006§).

In northern Florida, PCS transported its fertilizer products by rail to consumers; some materials, however, were sent by rail to the PCS port facility at Morehead City, NC, for export. PCS used barges and tugboats to move products from its Aurora, NC, complex to the Port of Morehead City for export or delivery by rail to domestic consumers. Phosphoric acid producers along the Gulf of Mexico received phosphate rock by ship from Morocco and transported their products by barge on the Mississippi River and its tributaries or by rail for domestic consumers. In Idaho and Utah, phosphate rock was sent from the mine to the processing facility via truck, rail, and slurry pipelines.

Prices

The average sold or used price increased to $29.20 per metric ton from $27.76 per ton in 2004 (tables 1, 5). Price data were collected through the semiannual canvass of producers and reflected the value of phosphate rock sold or used for phosphoric acid and elemental phosphorus production. A small amount was sold on a long-term contract and was included in the average price. Unlike many other mineral commodities, no standard domestic or world price for phosphate rock exists. Average ranges of world prices were published in various industry trade journals based on a sample of transactions. The import price of $40.91 per ton was based on the U.S. Census Bureau customs value and included cost, insurance, and freight (table 1).

Foreign Trade

U.S. producers reported no exports of phosphate rock in 2005 (table 1). The phosphate rock export table has been eliminated because domestic producers have ceased exporting rock.

Previous reports in this series have used U.S. Census Bureau export statistics to avoid disclosing proprietary data; the U.S. Census Bureau, however, includes reexports of phosphate rock by traders, which inflate the reported figure.

Exports of elemental phosphorus declined to 12,900 t in 2005 from 13,400 t in 2004; the reported customs value, however, increased to $2,000 per ton in 2005 from $1,694 per ton in 2004 (table 10).

The United States is the leading exporter of phosphate fertilizers in the world, accounting for about 45% of world P_2O_5 exports (Prud'homme, 2005). In 2005, total exports of P_2O_5 contained in fertilizer products increased slightly as higher DAP and phosphoric acid exports offset drops in MAP and triple superphosphate (tables 6, 9). Exports of DAP grew based on the strength of sales to India, which increased to 1.18 Mt from 426,000 t in 2004. The leading producers of phosphate fertilizers in India were hampered by shortages of phosphoric acid and higher raw materials costs, requiring imports to meet higher demand (Soomar, 2006). Sales to China fell for the third consecutive year because China continued to expand its domestic production capacity. MAP exports fell by 15% mainly because of lower fertilizer consumption in Brazil.

The United States is the leading importer of phosphate rock in the world. More than 75% of the shipments from Morocco were used by the three phosphoric acid producers located along the Gulf of Mexico. The remainder of Moroccan imports reportedly was used by Mosaic at its plants in Florida and Louisiana (Fertilizer Week, 2005b). In 2005, imports were estimated to be 2.63 Mt, based on U.S. Census Bureau data and export information received from Office Chérifien des Phosphates (OCP), the Moroccan phosphate producer (Bahcine Sendal, OCP, written commun., January 24, 2005). The U.S. Census Bureau withholds tonnage and value information for some phosphate rock and fertilizer product shipments, which necessitates the use of other data sources. The tonnage of U.S. imports of phosphate fertilizer products was insignificant compared with that of exports of the same fertilizer materials (table 11).

World Industry Structure

World production of marketable phosphate rock was 147 Mt, a 4% increase compared with that of 2004 (tables 1, 13). The United States with 36.3 Mt, China with 30.4 Mt, and Morocco with 25.2 Mt were the leading producing countries, accounting for 63% of production. The reported figure for production of phosphate rock in China was from official Chinese statistics. However, according to several sources, actual production of phosphate rock in China was about 45 Mt, with the inclusion of production at the numerous small, independent phosphate rock mines that were excluded from official statistics (Prud'homme, 2005).

World production of phosphoric acid was estimated to have grown by about 4% compared with that of 2004. China and India accounted for more than one-half of the increase in production. World consumption of phosphate acid for fertilizers was estimated to have decreased by about 2.4% from that of 2004 because of the combination of higher operating rates and lower MAP production. Phosphate fertilizer production grew slightly in 2005 (Prud'homme, 2005).

World Review

Brazil.—Yara ASA of Norway and Bunge Ltd. of Brazil entered into a 50:50 joint venture to conduct a feasibility study to develop the Anitapolis phosphate deposit in southern Brazil. This is the only known major phosphate rock deposit that has not been mined in Brazil. Yara had obtained a 54% share of the reserves in 2000 when it acquired Brazilian fertilizer company Adubos Trevo, and Bunge already held a 46% stake in the reserves. Yara sold 4% of the share of the reserves to Bunge to create an equal joint venture. The companies did not release information on the scope of the project (Fertilizer Week, 2005c).

Morocco.—OCP entered into two significant joint ventures in 2005 to produce phosphoric acid and fertilizer products. The largest agreement, in terms of tonnage, was signed with Sinochem to supply 750,000 t/yr of DAP to China from 2007 to 2011. OCP opened a new 850,000-t/yr DAP plant in December to supply its partners; however, its production capacity is expected to increase marginally because of ongoing refurbishment of existing DAP plants at Jorf Lasfar. The facility was planned to be at full capacity in mid-2006 (Middle East Economic Digest, 2005).

OCP and Bunge entered into an agreement to construct a new 375,000-t/yr phosphoric acid and 300,000-t/yr DAP, MAP, and TSP plant at Jorf Lasfar. The facility was expected to be completed in 2008 (Office Chérifien des Phosphates, 2005).

Nauru.—Australian Company Incitec Pivot Ltd. signed an agreement with the Government of Nauru to restart phosphate mining and to refurbish the associated processing plant. Pivot will provide materials and engineering to the new company, Republic of Nauru Phosphate Company, that was established by the Government of Nauru (Australian Broadcasting Corporation, 2005§). Phosphate rock production had diminished to about 11,000 t in 2005 because of depletion of reserves. Phosphate rock mining is the only industry on the small island nation, and the gradual decline of the mining industry has resulted in a near collapse of the country's economy and the lack of funds to improve mining methods to develop the remaining phosphate deposits. Pivot estimated that it could produce about 500,000 t/yr for 3 to 5 years (Australian Associated Press, 2005§).

Peru.—Brazilian firm Companhia Vale do Rio Doce (CVRD) won an auction held by the Peruvian Government to explore and develop the Bayovar phosphate deposit in the Piura region of northern Peru. CVRD estimated that the deposit had 816 Mt of reserves, and it has proposed mining about 3 Mt/yr of phosphate concentrate. Under the terms of the sale, a feasibility study must be completed in 2 years and production must begin in 5 years (Fertilizer Week, 2005a).

Outlook

U.S. phosphate rock production and consumption were expected to be lower in 2006 owing to the planned closure of one mine and two phosphoric acid plants, in addition to the closures of 2005 (Green Markets, 2006b). Several new mines were planned in Florida, but detailed permitting procedures and public opposition have slowed development. The new mines would be replacements for existing mines during the next decade and would not increase U.S. capacity.

U.S. production of phosphate fertilizers is dependent upon export sales, primarily of MAP to Brazil and DAP to China, India, and South Asia. MAP sales to Brazil were expected to increase in 2006, while DAP sales to India were dependent upon the level of domestic production and government subsidy programs. China continued to increase production of DAP and MAP; however, imports of DAP will still be needed to meet growing consumption and because of regional transportation issues and lack of production capacity. China imports most of its DAP from the United States, but with a new joint venture between Chinese and Moroccan producers planned to start in 2007, exports of DAP from the United States are expected to decrease in the future.

According to the International Fertilizer Industry Association, world phosphate fertilizer consumption in 2006 was expected to increase by 2.4% after falling in 2005, and growth was expected to be concentrated in Asia and South America. Domestic phosphate fertilizer consumption was expected to fall slightly in 2006 (Prud'homme, 2005).

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TABLE 1
SALIENT PHOSPHATE ROCK STATISTICS[1]

(Thousand metric tons and thousand dollars unless otherwise specified)

	2001	2002	2003	2004	2005
United States:					
Mine production (crude ore)	130,000	154,000	153,000	146,000	159,000
Marketable production:					
Quantity:					
Gross weight	31,900	36,100	35,000	35,800	36,300
P_2O_5 content	9,230	10,700	10,300	10,400	10,500
Value	856,000	993,000	946,000	995,000	993,000
Value, average[2] dollars per metric ton	26.82	27.47	27.01	27.79	27.34
Sold or used by producers:[3]					
Quantity:					
Gross weight	32,800	34,700	36,400	36,500	36,000
P_2O_5 content	9,500	10,300	10,600	10,500	10,400
Value[4]	879,000	962,000	981,000	1,010,000	1,050,000
Value, average dollars per metric ton	26.81	27.69	26.95	27.76	29.20
Exports:					
Quantity, gross weight	9 [5]	62 [5]	64 [5]	-- [6]	-- [6]
Value[6]	W	W	W	--	--
Value, average dollars per metric ton	W	W	W	XX	XX
Imports for consumption[e, 5, 7]					
Quantity, gross weight	2,500	2,700	2,400	2,500	2,630
Value, cost, insurance, and freight[e]	123,000	112,000	84,000	91,300	107,000
Value, average dollars per metric ton	49.30	41.45	35.55	36.50	40.91
Consumption, gross weight[e, 8]	35,300	37,400	38,800	39,000	38,600
Stocks, December 31, producers	7,510	8,860	7,540	7,220	6,970
World, production, gross weight	126,000	135,000	138,000 [r]	141,000	147,000 [e]

[e]Estimated. [r]Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits, except average values per metric ton.

[2]Average value based on the sold or used values.

[3]Includes domestic sales and exports.

[4]Total value of all domestic and export sales.

[5]Source: U.S. Census Bureau.

[6]Reported by producers.

[7]Includes some estimated phosphate rock tonnage imported from Morocco but not reported by the U.S. Census Bureau.

[8]Expressed as sold or used plus imports minus exports.

TABLE 2
ACTIVE PHOSPHATE ROCK MINES IN THE UNITED STATES IN 2005

Owner	Mine	County and State
CF Industries, Inc.	South Pasture	Hardee, FL.
Mosaic Co., The	Fort Green	Polk, FL.
Do.	Four Corners	Hillsborough/Manatee/Polk, FL.
Do.	Hookers Prairie	Polk, FL.
Do.	Hopewell	Hillsborough, FL.
Do.	Kingsford[1]	Polk/Hillsborough, FL.
Do.	South Fort Meade	Polk, FL.
Do.	Wingate Creek	Manatee, FL.
Nu-West Industries, Inc. (Agrium US, Inc.)	Dry Valley	Caribou, ID.
P4 Production, LLC. (Monsanto Co.)	South Rasmussen	Do.
PCS Phosphate Co., Inc.	Aurora	Beaufort, NC.
Do.	Swift Creek	Hamilton, FL.
Simplot, J.R, Co.	Smoky Canyon	Caribou, ID.
Do.	Vernal	Uintah, UT.

[1]Closed in September 2005.

TABLE 3
PRODUCTION OF PHOSPHATE ROCK IN THE UNITED STATES, BY REGION OR PERIOD[1]

(Thousand metric tons and thousand dollars)

	Mine production, crude ore		Marketable production, beneficiated			
Period or region	Rock	P_2O_5 content	Rock	P_2O_5 content	Value[2]	Ending stocks, rock
2004:						
Florida and North Carolina	138,000	12,900	30,400	8,930	859,000	W
Idaho and Utah	7,310	1,650	5,390	1,450	136,000	W
Total	146,000	14,500	35,800	10,400	995,000	7,220
2005:						
January-June	81,700	7,830	18,900	5,450	509,000	6,760
July-December	77,000	6,980	17,400	5,050	485,000	6,970
Total	159,000	14,800	36,300	10,500	993,000	XX

W Withheld to avoid disclosing company proprietary data. XX Not applicable.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Based on the per ton sold or used values.

TABLE 4
PHOSPHATE ROCK SOLD OR USED BY PRODUCERS IN THE UNITED STATES, BY REGION OR PERIOD[1]

(Thousand metric tons and thousand dollars)

Period or region	Rock	P_2O_5 content	Value[2]
2004:			
Florida and North Carolina	31,600	9,210	890,000
Idaho and Utah	4,920	1,280	123,000
Total	36,500	10,500	1,010,000
2005:			
January-June	17,600	5,070	525,000
July-December	18,400	5,320	526,000
Total	36,000	10,400	1,050,000

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

TABLE 5
VALUE OF U.S. PHOSPHATE ROCK, BY GRADE

(Dollars per metric ton, free on board mine)

Grade [percentage of bone phosphate of lime (BPL) content[1]]	2004	2005
66 to less than 70	W	W
60 to less than 66	27.82	29.12
Average weighted[2]	27.76	29.20

W Withheld to avoid disclosing company proprietary data.
[1]1.0% BPL (tricalcium phosphate)=0.458% P_2O_5.
[2]Includes less than 60% and greater than 70%, in addition to the grades listed.

TABLE 6
U.S. EXPORTS OF SUPERPHOSPHATES (CONCENTRATED)

(Thousand metric tons)

Country	2004	2005
Argentina	8	--
Australia	75	41
Brazil	108	38
Chile	57	28
Japan	25	37
Other	44	24
Total	317	168

-- Zero.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF DIAMMONIUM PHOSPHATE[1]

(Thousand metric tons)

Country	2004	2005
Argentina	365	197
Australia	227	259
Brazil	189	104
Canada	131	119
Chile	67	83
China	1,430	1,330
Colombia	127	113
Ecuador	76	50
Guatemala	36	90
India	426	1,180
Japan	296	244
Kenya	87	49
Mexico	400	381
New Zealand	115	137
Pakistan	412	642
Peru	118	118
Thailand	95	118
Turkey	55	68
Other	387	342
Total	5,040	5,620

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

Source: U.S. Census Bureau.

TABLE 8
U.S. EXPORTS OF MONOAMMONIUM PHOSPHATE[1]

(Thousand metric tons)

Country	2004	2005
Argentina	289	223
Australia	756	625
Brazil	1,020	522
Canada	623	609
Chile	83	70
Colombia	123	134
India	--	335
Japan	125	136
Mexico	161	161
Other	245	79
Total	3,420	2,890

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 9
U.S. EXPORTS OF PHOSPHORIC ACID[1]

(Thousand metric tons)

Country	2004	2005
Canada	17	20
Colombia	2	9
India	60	250
Other	79	144
Total	158	423

[1]Excludes superphosphoric acid tonnage.

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF ELEMENTAL PHOSPHORUS[1]

	2004		2005	
Country	Quantity (metric tons)	Value[2] (thousands)	Quantity (metric tons)	Value[2] (thousands)
Brazil	10,800	$16,300	9,120	$15,800
Canada	718	1,880	872	2,180
Japan	4	7	56	133
Korea, Republic of	5	10	22	46
Mexico	1,520	3,250	2,420	6,840
Taiwan	7	14	--	--
Other	334	1,200	366	800
Total	13,400	22,700	12,900	25,800

-- Zero.

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

[2]Free alongside ship values.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF PHOSPHATE ROCK AND PHOSPHATIC MATERIALS[1]

(Thousand metric tons and thousand dollars)

Phosphatic materials	2004		2005	
	Quantity	Value[2]	Quantity	Value[2]
Phosphate rock:				
Unground[3]	969	27,300	1,200	44,600
Ground[3]	510	26,600	518	27,300
Total[4]	2,500	91,300	2,630	107,000
Dicalcium phosphate	7	7,280	6	8,310
Elemental phosphorus	17	32,600	19	44,100
Normal superphosphate	(5)	83	1	169
Triple superphosphate	62	10,400	8	5,600
Diammonium phosphate	31	12,900	10	9,130
Fertilizer containing nitrates and phosphates	1	611	2	1,080
Phosphoric acid	71	22,900	58	27,900

[1]Data are rounded to no more than three significant digits.
[2]Declared cost, insurance, freight values.
[3]Some phosphate rock tonnages and values were suppressed by the U.S. Census Bureau.
[4]Includes an estimate for data suppressed by U.S. Census Bureau based on reported Moroccan exports to the United States.
[5]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 12
PHOSPHATE ROCK ANNUAL WORLD
PRODUCTION CAPACITY, DECEMBER 31, 2005[1]

(Thousand metric tons)

Region/country	Capacity
Africa	52,000
Asia	33,600
Europe and Russia	14,200
Latin America and Canada	7,000
Middle East	15,300
Oceania	2,700
United States	40,000
Total	165,000

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

Sources: International Fertilizer Industry Association and U.S. Geological Survey.

TABLE 13
PHOSPHATE ROCK, BASIC SLAG, AND GUANO: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Commodity and country[3]	Gross weight					P_2O_5 content				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Phosphate rock:										
Albania[e]	1	1	--	--	--	(4)	(4)	--	--	--
Algeria	939	740	905	1,014 [r]	878	280 [e]	230 [e]	280 [e]	300 [r, e]	260 [e]
Australia	1,893	2,025	2,285	2,014	2,050 [e]	438	482	545	490	550 [e]
Brazil, concentrate	4,805 [r]	5,084	5,584 [r]	6,074 [r]	6,100 [e]	1,708	1,831	2,005 [r]	2,181 [r]	2,200 [e]

See footnotes at end of table.

TABLE 13—Continued
PHOSPHATE ROCK, BASIC SLAG, AND GUANO: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Commodity and country[3]	Gross weight					P_2O_5 content				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Phosphate rock—Continued:										
Burkina Faso	1	2	2 e	2 e	2 e	(4)	1	1 e	1 e	1 e
Canada e	800	1,000	1,000	1,000	1,000	300	380	380	380	380
Chile	19	20	21	21	21 e	5	5	5	5	5 e
China e	21,000	23,000	25,200	25,500	30,400	6,300	6,900	7,550	7,650	9,130
Christmas Island e	568 5	500	500	655 r	685	190 5	167	167	210 r	220
Colombia e	43	43	43	43	43	8 5	8	8	8	8
Egypt, beneficiated	972	1,550	2,183	2,219	2,730 e	293	434 e	630	650 e	800 e
Finland e	750	800 r	800 r	840 r	825	277	290 r	290 r	306 r	301
India e	1,200	1,250	1,175	1,180	1,200	355	370	345	349	355
Indonesia e	1	1	1	1	1	(4)	(4)	(4)	(4)	(4)
Iran	213	303	194	230	250 e	26 e	36 e	23 e	28 e	30 e
Iraq, beneficiated e	300	300	30	3 r	3	100	100	10	1 r	1
Israel	3,511	3,476	3,208	2,947	2,900 e	1,115	1,110 e	1,020 e	900 e	880 e
Jordan	5,843	7,179	6,763	6,223	6,230 e	1,928	2,340	2,230 e	2,050 r	2,060 e
Kazakhstan	97	137	169	230	230 e	28	40	38	52 e	52 e
Korea, North e	350	300	300	300	300	105	95	95	95	95
Mexico	787	5 r	6 r	(4) r	--	236	1 r	2 r	(4) r	--
Morocco 6	21,983	23,041	22,877	25,369 r	25,200 e	7,400	7,700	7,400	8,500 e	8,300 e
Nauru e	266 5	150	84	22	11	100 5	55	26	7	3
Pakistan e	11	11	11	11	11	2	2	2	2	2
Peru	16 e	16 e	32	38 r	38 e	5	6	12	14 r	14 e
Philippines e	450	400	400	400	400	148	135	135	135	135
Russia e	10,500	10,700	11,000	11,000	11,000	3,900	4,000	4,000	4,000	4,000
Senegal	1,708	1,551 r	1,765 r	1,754 r	1,520	615	554 r	630 r	626 r	543
South Africa	2,420	2,803	2,643	2,735	2,577	995	1,086	1,030 e	1,067	1,000 e
Sri Lanka	35	39	41	42 e	43 e	12	13	14	14 e	15 e
Syria	2,043	2,483	2,414	2,883	3,500 e	613 e	745 e	725 e	870 e	1,050 e
Tanzania	4	1	4	7 r	7	1	(4)	1	2 r	2
Thailand	2	4	14	3 r	3 e	1 e	1 e	4 e	1 e	1 e
Togo	1,067	1,271	1,471	1,115	1,215	380 e	460 e	530 e	418 r, e	368 e
Tunisia, washed e	8,144 5	7,461 r, 5	7,890	7,954 r, 5	8,000	2,440	2,200 r	2,300	2,400 e	2,400 e
United States	31,900	36,100	35,000	35,800	36,300	9,230	10,700	10,600	10,400	10,500
Uzbekistan e	200	425	430	430	430	47	101	102	102	102
Venezuela e	399 5	390 5	260 5	250	250	114	111	75	70	67
Vietnam e	677	680	823 r	800 r	820	225	204	247 r	240 r	246
Zimbabwe, concentrate	87	108	95	83	50 e	28	39	31	27	16 e
Total	126,000	135,000	138,000 r	141,000	147,000	40,000 r	42,900 r	43,500 r	44,600 r	46,100
Basic (Thomas converter) slag: e										
Egypt	7	7	7	7	8	2	2	2	2	2
France	50	50	50	50	50	8	8	8	8	8
Germany	200	200	150	150	150	20	20	18	18	18
Luxembourg	475	475	475	450	475	70 r	70 r	70 r	70 r	70
Total	732	732	682	657	683	100 r	100 r	98 r	98 r	98

e Estimated. r Revised. -- Zero.

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

[2] Table includes data available through May 3, 2006. Data for major phosphate rock-producing countries derived in part from the International Fertilizer Industry Association; other figures are from official country sources where available.

[3] Phosphate rock may be produced in Nigeria, but information is inadequate to estimate output.

[4] Less than ½ unit.

[5] Reported figure.

[6] Includes production from Western Sahara.