



2012 Minerals Yearbook

PHOSPHATE ROCK

PHOSPHATE ROCK

By Stephen M. Jasinski

Domestic survey data and tables were prepared by Raymond I. Eldridge III, statistical assistant, and the world production table was prepared by Glenn J. Wallace, international data coordinator.

Domestic and world phosphate rock production increased in 2012 from those of 2011. U.S. production of phosphate rock was 30.1 million metric tons (Mt), a 7% increase from that of 2011. World phosphate rock production was estimated to be 215 Mt, a 7% increase from that of 2011. Reported domestic use of phosphate rock decreased to 27.3 Mt from 28.6 Mt in 2011 because of lower production and export sales of phosphoric acid and phosphate fertilizers. This resulted in a significant increase in producer stocks of phosphate rock, which increased to 6.7 Mt, 46% more than at yearend 2011 (table 3). World phosphate rock consumption was estimated to have been about the same as in 2011. U.S. apparent consumption decreased by 5% from 32.0 Mt in 2011 to 30.4 Mt in 2012 (table 1).

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 noted otherwise), phosphate rock 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 production of phosphoric acid for agricultural use in 2012 decreased to 7.89 Mt P_2O_5 from 8.42 Mt in 2011. Combined production of diammonium phosphate (DAP) and monoammonium phosphate (MAP), the major fertilizer products manufactured from phosphoric acid, was 10.7 Mt, which was 7% lower than that in 2011. Combined exports of DAP and MAP, which were equivalent to about 40% of domestic production, declined by 10%. (Fertilizer Institute, The, 2013).

Production

U.S. Geological Survey domestic phosphate rock production data were obtained from monthly and semiannual voluntary canvasses of all companies that mined phosphate rock. All companies responded to the canvasses. In 2012, phosphate rock was produced at six mines in Florida, three in Idaho, and one each in North Carolina and Utah (table 2).

The U.S. phosphate industry is concentrated in Florida in the counties of Hamilton, Hardee, Hillsborough, Manatee, and Polk. In 2012, the mines in Florida accounted for 65% of domestic annual production capacity. The Mosaic Company operated four mines, and CF Industries Holdings, Inc. and PCS Phosphate Co., Inc. each operated one mine (table 2).

In Beaufort County, NC, PCS operated a large integrated production facility that included a mine, as well as animal feed, fertilizer, and phosphoric acid plants.

In the Western Phosphate Field of Idaho, Montana, Utah, and Wyoming, four mines were active in 2012—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.

Stonegate Agricom Ltd. (Toronto, Ontario, Canada) continued to develop the Paris Hills phosphate project in Bear Lake County in southeastern Idaho. The company planned to open an underground phosphate rock mine in a 1,010-hectare area where three mines operated intermittently during the 20th century. The Bloomington Canyon Mine operated from 1942 to 1943 and from 1973 to 1975, the Consolidated Mine operated from 1930 to 1932, and the Paris Canyon Mine operated from 1917 to 1926 (Jasinski and others, 2004). In December 2012, the company announced the completion of a feasibility study, which reported total measured and indicated mineral reserves of 16.7 Mt of marketable rock, with an average grade of 29.5% P_2O_5 . The ore would not require beneficiation. Stonegate planned to have an average production of 904,000 metric tons per year (t/yr) for about 19 years. The company expected to receive its permits and begin mining by the end of 2014 (Green Markets, 2012).

Consumption

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 for animal feed supplements, direct application to soil, and elemental phosphorus production. Domestic apparent consumption of phosphate rock was 30.4 Mt compared with 32.0 Mt in 2011 (table 1). No sales of domestically mined phosphate rock were reported by producers.

All phosphate rock mining companies were vertically integrated, having one or more fertilizer plants, usually located near the mine. Mosaic was the leading company with about 56% of domestic phosphoric acid production capacity and 13% of world capacity. In 2012, this company operated three wet process phosphoric acid plants and three fertilizer plants in Florida and one of each in Louisiana (Mosaic Company, The, 2013, p. 5).

PCS had phosphoric acid and fertilizer production facilities near its mines in Florida and North Carolina. In Idaho, Simplot sent ore from its Smoky Canyon Mine by slurry pipeline to its fertilizer plant in Pocatello, ID; Simplot sent ore by pipeline from the Vernal Mine in Utah to its plant in Rock Springs, WY.

Two companies—Mississippi Phosphates Corp., Pascagoula, MS, and PCS Nitrogen, Inc., Geismar, LA—manufactured wet-process phosphoric acid using imported phosphate rock from Morocco. Mississippi Phosphates produced phosphate fertilizer products for domestic and export markets. PCS Nitrogen sold some merchant-grade phosphoric acid to Innophos

Holdings, Inc., which had a nearby facility for upgrading into high-purity acid for technical- and food-grade applications (Innophos Holdings, Inc., 2013, p. 7).

Monsanto operated the only elemental phosphorus plant in the United States in Soda Springs, ID. The company used elemental phosphorus to manufacture phosphorus trichloride, which was used as a chemical intermediary for the production of glyphosate-base herbicides (Monsanto Co., 2013, p. 8). In other countries, elemental phosphorus was used chiefly to manufacture high-purity phosphoric acid by burning the phosphorus in water, to what is known as thermal acid. Worldwide, there has been a gradual shift to manufacturing high-purity phosphoric acid from wet-process acid, which has lower production costs and none of the hazardous waste disposal issues that are associated with elemental phosphorus. Thermal acid, however, still accounts for more than 50% of annual world production capacity of high-purity phosphoric acid, primarily in China. The only other operating elemental phosphorus facilities in the world were located in China and Kazakhstan.

The United States is considered a mature market for phosphate fertilizers, with average annual consumption of slightly more than 4.0 Mt from 1992 to 2012. Fertilizer consumption information is collected by the American Association of Plant Food Officials on a crop year (July 1 to June 30) basis. The most recent data, for crop year 2012 (July 1, 2011, to June 30, 2012), reported that consumption of P_2O_5 consumed in fertilizers was 3.95 Mt compared with 3.90 Mt in 2011 (Slater and Kirby, 2014, p. 6).

Transportation

In Florida and North Carolina, crude phosphate rock ore was sent by slurry pipeline from the mines to the processing plants. The beneficiated phosphate rock was sent by conveyers to acid plants; all beneficiated phosphate rock was used internally to manufacture wet-process phosphoric acid. 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 United States.

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 transported products from its Aurora, NC, complex to the Port of Morehead City by barge for export or delivery by rail to domestic consumers. Phosphoric acid producers along the Gulf of Mexico received imported phosphate rock by ship and transported their products by barge on the Mississippi River and its tributaries or by rail to domestic consumers. In Idaho and Utah, phosphate rock was transported to the processing facility from the mine via rail, slurry pipeline, and truck.

Prices

Price data were collected through the semiannual canvass of producers and reflected the value of phosphate rock used for production of phosphoric acid and elemental phosphorus. The total value of phosphate rock sold or used in the United States decreased by 8% from that of 2011 (table 1). Unlike many other mineral commodities, no standard domestic or world price for

phosphate rock exists. Ranges of average world prices based on a sample of transactions were published in various industry trade journals. The average unit value of \$144.04 per metric ton of imported phosphate rock was determined 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 2012 (table 1). The United States is the leading importer of phosphate rock in the world. In 2012, about 65% of imported phosphate rock was from Morocco with the rest from Peru. All imported phosphate rock was consumed by phosphoric acid producers located along the Gulf of Mexico—Mississippi Phosphates (Mississippi), Mosaic (Louisiana), and PCS Nitrogen (Louisiana). In 2012, U.S. imports were estimated to be 3.08 Mt, based on data from the U.S. Census Bureau and PERS, a commercial database reporting on waterborne trade activity. Tonnage and value information for some phosphate rock imports into Louisiana was not reported by the U.S. Census Bureau, which necessitated the use of another source of information. U.S. import tonnage of other phosphate fertilizers was insignificant compared with exports of the same materials (tables 5–7, 9).

The United States is the leading exporter of phosphate fertilizers in the world, accounting for about 25% of world P_2O_5 contained in processed phosphate exports in 2012. In total, exports of phosphoric acid and phosphate fertilizers decreased by 10%, in terms of P_2O_5 content (Fertilizer Institute, The, 2012). India was the leading destination for U.S. phosphate exports (tables 5–7).

World Review

World production of phosphate rock increased by 7% in 2012 compared with that of 2011. China (95.3 Mt), the United States (30.1 Mt), and Morocco (27.1 Mt) were the leading producing countries, accounting for 71% of the world total (table 10). In 2012, much of the activity in phosphate rock exploration and expansion took place in Africa and Australia. Major projects were under development in Morocco (capacity expansion), Namibia (new offshore mining operation), and Saudi Arabia. New mines were under various stages of development in Angola, Congo (Brazzaville), Guinea-Bissau, Mali, Mozambique, and Uganda. Expansion of production capacity was planned in Egypt, Senegal, South Africa, Togo, and Tunisia. Other new mines and expansion of new facilities outside of Africa were ongoing in Brazil, Canada, China, Finland, Kazakhstan, New Zealand, Peru, and Russia (Fertilizer International, 2012).

Australia.—In October 2012, Minemakers Ltd. sold its share of the Sandpiper Marine Phosphate project in Namibia to Mawarid Mining LLC of Oman, in order to concentrate on development of the Wonarah Phosphate project in the Northern Territory of Australia. Minemakers began a feasibility study in 2012 for the Wonarah project based on using the improved hard process (IHP) to manufacture phosphoric acid. The IHP uses a kiln, similar to elemental phosphorus production, to manufacture

phosphoric acid. It eliminates the need for grinding and flotation to process the ore and does not produce phosphogypsum as a byproduct. The company planned to conduct pilot testing of the IHP in Florida at the demonstration plant of JDCPhosphate, Inc., the owner of IHP (Minemakers Ltd., 2013, p. 3–11).

Canada.—Arianne Phosphate Inc. continued development of the Lac à Paul Project in Northern Quebec. An enhanced prefeasibility study was completed in May 2012 that showed measured and indicated resources of 348 Mt of apatite with an average grade of 6.5% P_2O_5 that could be upgraded to a 38% P_2O_5 . Arianne expected production to average 3 Mt/yr of concentrate for 17 years of projected mine life. The company expected a feasibility study to be completed in 2013 and mining to begin in 2016 (Arianne Phosphate Inc., 2012).

Namibia.—Development of the offshore Sandpiper Marine Phosphate project continued in 2012. The project was owned by Namibian Marine Phosphate (Pty) Ltd. (NMP), a joint venture between UCL Resources Ltd. (Australia), Mawarid Mining LLC (Oman), and Tungeni Investments cc (Namibia). The NMP project was 60 kilometers off the coast of Namibia and encompassed about 7,000 square kilometers. The company planned to dredge phosphate sediments at depths of 180 to 300 meters, which would be pumped to a processing plant onshore near Walvis Bay. NMP reported proven and probable reserves of 133 Mt, with an average grade of 20.4% P_2O_5 . In 2013, the company planned to conduct ore processing tests and complete an environmental management plan (Fertilizer International, 2012).

Russia.—JSC Acron, through its North-Western Phosphorus Co. subsidiary, began mining at the Oleniy Ruchey deposit in the Murmansk region. The mine has a production capacity of 1 Mt/yr of concentrate with an average grade of 39% P_2O_5 , and the company planned to increase capacity to 2 Mt/yr in 2018. The deposit had reported reserves of 255 Mt, with an average grade of 13.47% P_2O_5 (JSC Acron, 2013).

Saudi Arabia.—In 2012, Saudi Arabian Mining Company (Ma'aden) announced that it would begin development of the Wa'ad Al-Shammal project, which would include a new phosphate rock mine at Umm Wu'al to exploit the Al-Khabra deposit. The 5.3-Mt/yr mine would supply a new 1.5-Mt/yr P_2O_5 phosphoric acid plant. Ma'aden expected to complete the project by 2017 (Fertilizer International, 2013).

Outlook

World phosphate rock production capacity is projected to increase by 6% to 260 Mt/yr in 2017 from 245 Mt/yr in 2014. The increase will be from a combination of new mines and expansion of existing operations. The bulk of the new capacity will be in Africa, Asia, and the Middle East (Fertilizer International, 2013). U.S. production capacity will likely remain the same or decrease slightly through 2015, depending on whether three new mines under development in Florida are able

to receive permits to operate. Three new mines are planned in Idaho, but two would be as replacements for existing mines and would not significantly change domestic production capacity.

The projected increases in annual production capacity for phosphate rock will supply the associated increase in phosphoric acid and fertilizer production. World population growth ensures the need for phosphate fertilizer to grow crops for food and biofuels. According to the International Fertilizer Industry Association, world consumption of P_2O_5 in fertilizer is projected to increase slightly over the next several years to 45 Mt in 2017 from 41.4 Mt in 2012. Phosphoric acid production capacity is expected to increase gradually to 63.7 Mt P_2O_5 in 2017 from 52.8 Mt P_2O_5 in 2012 (Heffer and Prud'homme, 2013).

Domestic production and consumption of phosphate rock in 2013 are expected to be slightly higher than those in 2012, owing to a projected increase in phosphoric acid production.

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TABLE 1
SALIENT PHOSPHATE ROCK STATISTICS¹

(Thousand metric tons and thousand dollars unless otherwise specified)

	2008	2009	2010	2011	2012
United States:					
Mine production (crude ore)	124,000	107,000	106,000	129,000	150,000
Marketable production:					
Quantity:					
Gross weight	30,200	26,400	25,800	28,100	30,100
P ₂ O ₅ content	8,590	7,640	7,400	8,160	8,590
Value	2,320,000	3,360,000	1,980,000	2,720,000	3,080,000
Value, average ² dollars per metric ton	76.76	127.19	76.69	96.64	102.54
Sold or used by producers:					
Quantity:					
Gross weight	28,900	25,500	28,100	28,600	27,300
P ₂ O ₅ content	8,200	7,380	8,000	8,320	7,720
Value	2,210,000	3,250,000	2,210,000	2,850,000	2,620,000
Value, average dollars per metric ton	76.64	127.22	78.50	99.61	96.12
Imports for consumption^{e,3,4}					
Quantity, gross weight	2,750	2,000	2,400	3,350	3,080
Value, cost, insurance, and freight ^e	266,000	161,000	211,000	392,000	444,000
Value, average dollars per metric ton	96.95	80.61	87.79	116.88	144.04
Consumption, gross weight ^{e,5}	31,600	27,500	30,500	32,000	30,400
Stocks, December 31, producers	6,340	8,120	5,620	4,580	6,700
World, production, gross weight	166,000	162,000	184,000 ^r	201,000 ^r	215,000 ^c

^eEstimated. ^rRevised.

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

²Average value based on the sold or used values.

³Sources: U.S. Census Bureau and PIERS.

⁴Includes some estimated phosphate rock tonnage imported from Morocco but not reported by the U.S. Census Bureau.

⁵Expressed as sold or used plus imports.

TABLE 2
ACTIVE PHOSPHATE ROCK MINES IN THE UNITED STATES IN 2012

Owner	Mine	County and State
CF Industries Holdings, Inc.	South Pasture	Hardee, FL.
Mosaic Company, The	Four Corners	Hillsborough/Manatee/Polk, FL.
Do.	Hookers Prairie	Polk, FL.
Do.	South Fort Meade	Do.
Do.	Wingate	Manatee, FL.
Nu-West Industries, Inc. (Agrium Inc.)	Rasmussen Ridge	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.
Do. Ditto.		

TABLE 3
PRODUCTION OF PHOSPHATE ROCK IN THE UNITED STATES, BY PERIOD¹

(Thousand metric tons and thousand dollars)

Period	Mine production, crude ore		Marketable production, beneficiated			Ending stocks, rock
	Rock	P ₂ O ₅ content	Rock	P ₂ O ₅ content	Value ²	
2011:						
January–June	60,900	6,400	13,800	4,010	1,390,000	4,860
July–December	68,400	6,950	14,300	4,160	1,330,000	4,580
Total	129,000	13,300	28,100	8,160	2,720,000	XX
2012:						
January–June	71,900	7,430	14,500	4,150	1,500,000	5,570
July–December	78,500	8,160	15,600	4,440	1,580,000	6,700
Total	150,000	15,600	30,100	8,590	3,080,000	XX

XX Not applicable.

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

TABLE 4
PHOSPHATE ROCK SOLD OR USED BY PRODUCERS
IN THE UNITED STATES, BY PERIOD¹

(Thousand metric tons and thousand dollars)

Period	P ₂ O ₅		Value ²
	Rock	content	
2011:			
January–June	13,600	3,910	1,300,000
July–December	15,000	4,410	1,550,000
Total	28,600	8,320	2,850,000
2012:			
January–June	13,200	3,760	1,280,000
July–December	14,100	3,960	1,340,000
Total	27,300	7,720	2,620,000

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

²Free on board mine.

TABLE 5
U.S. EXPORTS OF DIAMMONIUM PHOSPHATE^{1,2}

(Thousand metric tons and thousand dollars)

Country	2011		2012	
	Quantity	Value	Quantity	Value
Argentina	128	62,800	179	92,000
Australia	102	61,100	147	78,200
Brazil	303	181,000	521	242,000
Canada	213	41,000	134	46,100
Colombia	96	58,800	123	63,000
India	2,100	1,240,000	1,060	557,000
Japan	169	102,000	209	110,000
Kenya	25	15,000	96	47,400
Mexico	189	99,100	406	134,000
Peru	71	37,600	130	65,400
Other	535 ^r	290,000 ^r	618	304,000
Total	3,940	2,190,000	3,630	1,740,000

^rRevised.

¹Presentation of annual data is based on the top 10 quantities (gross weight) of the leading countries in 2012.

²Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 6
U.S. EXPORTS OF MONOAMMONIUM PHOSPHATE^{1,2}

(Thousand metric tons and thousand dollars)

Country	2011		2012	
	Quantity	Value	Quantity	Value
Argentina	267	161,000	245	123,000
Australia	252	153,000	340	176,000
Brazil	841	491,000	597	306,000
Canada	906	585,000	824	473,000
Colombia	156	95,700	113	52,200
Japan	99	60,400	109	54,600
Mexico	69	36,100	68	35,600
Peru	11	6,750	15	7,870
South Africa	--	--	34	17,600
Venezuela	(3)	5	24	12,800
Other	111 ^r	55,900 ^r	37	18,200
Total	2,710	1,650,000	2,410	1,280,000

^rRevised. -- Zero.

¹Presentation of annual data is based on the top 10 quantities (gross weight) of the leading countries in 2012.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF PHOSPHORIC ACID^{1,2}

(Thousand metric tons and thousand dollars)

Country	2011		2012	
	Quantity	Value	Quantity	Value
Argentina	32	17,300	25	13,300
Brazil	92	47,000	104	43,000
Canada	17	5,030	22	6,530
India	588	272,000	540	221,000
Mexico	220	65,200	93	27,400
Other	5	1,430	4	96,600
Total	954	408,000	788	408,000

¹Excludes superphosphoric acid tonnage.

²Data 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 ELEMENTAL PHOSPHORUS¹

Country	2011		2012	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Brazil	11,600	\$41,200	15,700	\$54,100
Canada	1,120	3,800	865	2,790
Mexico	1	14	26	58
Netherlands	303	575	2,440	5,010
Other	43 ^r	112 ^r	45	108
Total	13,100	45,700	19,100	62,000

^rRevised.

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

²Free alongside ship values.

Source: U.S. Census Bureau.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF PHOSPHATE ROCK AND
PHOSPHATIC MATERIALS¹

(Thousand metric tons and thousand dollars)

Phosphatic material	2011		2012	
	Quantity	Value ²	Quantity	Value ²
Phosphate rock:				
Unground ³	2,450	345,000	2,170	326,000
Ground ³	402	62,900	385	74,900
Total ⁴	3,350	392,000	3,080	444,000
Dicalcium phosphate	7	10,800	7	11,200
Elemental phosphorus	5	18,700	11	43,000
Normal superphosphate	4	1,580	1	337
Triple superphosphate	207	113,000	209	104,000
Diammonium phosphate	260	155,000	92	52,500
Monoammonium phosphate	598 ^r	358,000 ^r	477	268,000
Fertilizer containing nitrates and phosphates	2	895	3	1,320
Phosphoric acid	1	185	2	598

^rRevised.

¹Data are rounded to no more than three significant digits.

²Declared cost, insurance, freight values.

³Some phosphate rock tonnages and values were not reported by the U.S. Census Bureau.

⁴Includes an estimate for tonnage data not reported by the U.S. Census Bureau.

Sources: U.S. Census Bureau and the PIERS.

TABLE 10
PHOSPHATE ROCK AND BASIC (THOMAS CONVERTER) SLAG: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Commodity and country ³	Gross weight					P ₂ O ₅ content				
	2008	2009	2010	2011 ^c	2012 ^c	2008	2009	2010	2011 ^c	2012 ^c
Phosphate rock:										
Algeria	1,805	1,070	1,525	1,290 ^{r,4}	1,251 ⁴	542 ^c	305 ^c	458 ^c	386 ^r	375
Australia ^c	2,950	2,500	2,600	2,650	2,600	678	575	600	610	600
Brazil, concentrate	6,727	6,084	6,192	6,738 ^{r,4}	6,740 ⁴	2,472	2,163	2,179	2,374 ^{r,4}	2,388 ⁴
Canada ^c	1,000 ^r	990 ^r	980 ^r	1,100 ^r	900	370 ^r	360 ^r	360 ^r	400 ^r	330
Chile:										
Apatite	21	11	9	14 ^{r,4}	9 ⁴	7	3	3	4 ^{r,4}	3 ⁴
Guano	3	2	1	2 ^{r,4}	1 ⁴	NA	NA	NA	NA	NA
Phosphorite	17	1	41	-- ^r	6	NA	NA	NA	-- ^r	NA
China	50,700	60,200	68,000	81,000 ⁴	95,300	15,200	18,000	20,400	24,000 ⁴	28,500
Colombia ^c	27	47 ^r	45 ^r	45 ^r	30	8	14 ^r	14 ^r	14 ^r	9
Egypt, beneficiated	5,523	6,627	3,435	4,746 ^{r,4}	6,236 ⁴	1,657	1,868 ^r	1,030 ^r	1,400 ^r	1,684 ⁴
Finland	780 ^r	650	817 ^r	870 ^{r,4}	870	260 ^r	225 ^r	289 ^{r,c}	307 ^r	307
India ^c	1,220	1,230	1,240	1,250	1,260	631	640	645	650	655
Indonesia ^c	1	1	1	1	1	(5)	(5)	(5)	(5)	(5)
Iran ^c	330 ^r	540 ^r	210 ^r	98 ^{r,4}	100	37 ^r	62 ^r	24 ^r	11 ^r	11
Iraq, beneficiated	1 ^r	30 ^r	139 ^r	122 ^{r,4}	250	(5) ^r	10 ^r	42 ^r	37 ^r	75
Israel	3,088	2,697	3,135	3,105 ⁴	3,513 ⁴	850 ^c	740 ^c	860 ^c	850	960
Jordan	6,266 ^r	5,282 ^r	6,529	7,623 ^{r,4}	6,383 ⁴	2,002 ^r	1,690 ^r	2,090 ^r	2,300 ^{r,4}	1,900 ⁴
Kazakhstan ^c	1,226 ⁴	1,225 ⁴	1,600	1,600	1,600	280	280	350	350	350
Korea, North ^c	947 ^r	947 ^r	947 ^r	947 ^r	947 ^r	300 ^r	300 ^r	300 ^r	300 ^r	300
Mexico	968	1,443	1,507	1,691 ^{r,4}	1,725 ⁴	291	433	452	507 ^{r,4}	517 ⁴
Morocco ⁶	24,861 ^r	18,307 ^r	26,603 ^r	28,052 ^{r,4}	27,100 ⁴	8,000 ^r	6,000 ^r	8,500 ^r	9,200	9,000
Pakistan	4	30 ^r	88 ^r	127 ^{r,4}	82 ⁴	1	5 ^r	16 ^r	23 ^{r,4}	15 ⁴
Peru	--	--	2,470 ^r	2,540 ^{r,4}	2,560 ⁴	--	--	741 ^r	762 ^{r,4}	768 ⁴
Philippines	2	2	2	3 ⁴	3	1	1	1	1 ⁴	1
Russia ^c	10,400	9,500	11,000	11,000 ^r	10,000	3,800	3,500	4,000	4,000 ^r	3,700
Saudi Arabia	--	100 ^r	1,000 ^r	1,000 ^r	3,000	--	15 ^r	330 ^r	330 ^r	960
Senegal	645	949 ^r	1,079 ^r	1,411 ^{r,4}	1,381 ⁴	180	283 ^r	312 ^r	362 ^{r,4}	363 ⁴
South Africa	2,287	2,237	2,494	2,565 ^{r,4}	2,242 ⁴	858	839	935	962 ^{r,4}	841 ⁴
Sri Lanka	42	36	48	48	49	15 ^c	14 ^c	18 ^c	18	18
Syria	2,629 ^r	2,128 ^r	3,167 ^r	3,541 ^{r,4}	1,534 ⁴	789 ^r	740 ^r	950 ^r	1,062 ^{r,4}	460 ⁴
Tanzania	29	20 ^r	17 ^r	18 ^r	18	9	6 ^r	5 ^r	5 ^r	5
Thailand	4	1 ^r	36 ^r	3 ^{r,4}	2 ⁴	1	(5)	11 ^r	1 ^r	1 ⁴
Togo	842	726	695 ^r	866 ^{r,4}	1,110 ⁴	303	260	250 ^r	310 ^r	400
Tunisia, washed	7,692 ^r	7,398	7,281	3,350 ^{r,4}	2,762 ⁴	2,230 ^{r,c}	2,140 ^c	2,110 ^c	1,000 ^r	800
United States	30,200	26,400	25,800	28,100 ⁴	30,100 ⁴	8,590	7,640	7,400	8,160 ⁴	8,590 ⁴
Uzbekistan ^c	600	600	800	800	800	140	140	187 ^r	187 ^r	187
Venezuela ^c	400	400	400	400	400	115	115	115	115	115
Vietnam	2,101	2,047	2,325 ^r	2,395 ^{r,4}	2,365 ⁴	630	614	680	720 ^{r,4}	710 ⁴
Zimbabwe, concentrate ^c	21 ^{r,4}	20 ^r	63 ^r	60 ^r	20	7 ^r	6 ^r	20 ^r	19 ^r	6
Total	166,000	162,000	184,000^r	201,000^r	215,000	51,300^r	50,000^r	56,700^r	61,700^r	65,900
Basic (Thomas converter) slag:^c										
France	50	50	50	50	50	8	8	8	8	8
Luxembourg	475	475	475	475	475	70	70	70	70	70
Total	525	525	525	525	525	78	78	78	78	78

^cEstimated. ^rRevised. NA Not available. -- Zero.

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

²Includes data available through September 9, 2014. Figures are from official country sources where available.

³In addition to the countries listed, Burkina Faso, Nauru, and Nigeria had produced phosphate rock, but available information is inadequate to make reliable estimates of output levels.

⁴Reported figure.

⁵Less than ½ unit.

⁶Includes production from Western Sahara.