POTASH

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Potash consumption increased in 2004, exceeding world production and depleting inventories. About 2.7 million metric tons (Mt) of minerals was mined to produce 1.3 Mt of potassium oxide (K_2O) equivalent,[1] which was an 18% increase from that of 2003. Consumption and sales by producers also increased in 2004 with a 13% increase in price compared to that in 2003. The trade market saw a slight increase of 4% in imports but a large decrease of 29% in exports (table 1). The industry went through some restructuring in 2004 with some companies merging and others were taken over. The size of the industry has stayed the same, but the number of companies has decreased.

Potash denotes a variety of mined and manufactured salts, all of which contain the element potassium in water-soluble form. More than 85% of the domestic production of potash is near Carlsbad, NM, with most of the potash coming from the mineral sylvite. At the end of the 19th century, potash production came from hardwood trees and was a mixture of potassium carbonate and potassium hydroxide, both of which are caustic. Lye denoted sodium hydroxide, and potash lye was potassium hydroxide, a higher grade product that resulted in better grade of soap than the lye soap being used for laundry. The 1942 Webster's dictionary defined potash as potassium carbonate. Since approximately 1950, the term potash was used to indicate potassic fertilizers, which were potassium chloride (KCl or sylvite), potassium sulfate [K_2SO_4 or sulfate of potash (SOP), usually a manufactured product], and potassium-magnesium sulfate [$K_2SO_4 \cdot 2MgSO_4$ or langbeinite or double sulfate of potash magnesia (SOPM or K-Mag)]. Muriate of potash (MOP) is an agriculturally acceptable mix of KCl (95% pure or greater) and sodium chloride (halite) for fertilizer use that includes minor amounts of other nontoxic minerals from the mined ore and is neither the crude ore sylvinite nor pure sylvite.

This publication has historically included potassium nitrate [KNO_3 or saltpeter or nitrate of potash (NOP), a mostly manufactured product] and mixed sodium-potassium nitrate ($NaNO_3$ and KNO_3 or Chilean saltpeter, a natural product) because it functions as a potassic plus nitrogenous fertilizer. Saltpeter (potassium nitrate) and Chilean saltpeter are still noted in the import tables (tables 8, 9). Alunite, feldspar, and muscovite are potassium-bearing minerals that have a very low solubility in water and are considered to be neither potassic fertilizers nor ores for price-competitive potassic fertilizers.

[1]"Because the amount of potassium in the common salts of potassium varies, the industry has established a common standard of measurement of defining a product's potassium content [or purity], in terms of equivalent percentages of potassium oxide (K_2O). A K_2O equivalent of 60 percent, [51] percent, and 22 percent is the customary minimum standard for muriate of potash, sulfate of potash, and double sulfate of potash magnesia products, respectively" (IMC Global, Inc., 2004, p. 8). All tonnages are reported in metric tons, K_2O equivalent, unless otherwise specified. All percentages are computed on unrounded K_2O equivalent values.

Production

Domestic production data were developed by the U.S. Geological Survey (USGS) from a semiannual voluntary canvass of U.S. operations. All seven of the operations canvassed for both semiannual surveys responded, representing 100% of the total production listed in table 1. Three companies produced potash from seven operations in three States. Most domestic production was from southeastern New Mexico where one company operated two mines and a second company operated one mine with multiple products (table 2). The second company also operated a deep-solution mine in Michigan. The third State with potash production was Utah where two companies produced potash from three operations.

Potash producers in the United States produced MOP, SOP, and SOPM. Published production data of all types and grades of potash in the United States have been adjusted since mid-1997 to avoid disclosing the proprietary data of companies that produce SOP and SOPM, which together are known as sulfates.

In 2004, production of potash in the United States increased by about 18% from the previous year to 1.3 Mt (table 1). Production and sales by producers have generally decreased during the past 5 years but have increased in 2004 to their highest levels in 5 years. After 2 years of stagnant sales, sales by producers increased 8% even as prices increased. The price of potash slowly increased until it peaked in 1998 and then dropped to level at $230 per metric ton of K_2O equivalent for the past 5 years. The 13% increase in price to $260 per metric ton of K_2O equivalent in 2004 from 2003 was the largest single increase in the past 15 years.

Early in 2004, Intrepid Mining LLC acquired the potash assets of Mississippi Potash Inc. a (subsidiary of Mississippi Chemical Corp.) for an estimated $27 million. Mississippi Potash owned and operated a pair of underground sylvinite mines and related facilities in Carlsbad. In addition, Mississippi Potash owned Eddy Potash, Inc., which had suspended operations at its underground mine in December 1997. Mississippi Potash produced approximately 872,000 metric tons (t) of potash and netted $69.5 million from sales in 2003 (Denver Business Journal, 2004§[2]).

In the spring, Intrepid Mining signed a deal to buy operations from Reilly Industries, Inc. Intrepid Wendover Potash LLC (owned by Intrepid Mining LLC) took control of Reilly Industries' brine and potash business, including its Wendover brine facility in Utah (Green Markets, 2004f). Potash and magnesium chloride are recovered through surface extraction at the Wendover site, which has been owned by Reilly since 1988 and has been in continuous operation since 1932. Later in the year, Intrepid announced its intention to produce langbeinite by modifying the Carlsbad East potash plant to become the second langbeinite producer in the United States. In

[2]A reference that includes a section mark (§) is found in the Internet Reference Cited section.

August, Intrepid reported that it had tripled production at the new operation by applying horizontal drilling (Green Markets, 2004c).

In January, IMC Global, Inc. and Crop Nutrition (a subsidiary of Cargill, Inc.) announced their intent to form a new company called The Mosaic Company. With 2003 revenues of $2.2 billion, IMC Global was the world's leading producer and marketer of concentrated phosphates and potash crop nutrients for the agricultural industry (Green Markets, 2004b). Mosaic started up for business in October 2004 with its new headquarters based in Minneapolis, MN (Green Markets, 2004d). The new company, with more than 8,000 employees worldwide, operates 16 phosphate rock mines and plants, 5 potash production facilities, and key distribution facilities in 11 countries, which serve customers in 33 countries.

Consumption

Consumption of K_2O equivalent increased again in 2004 to the highest level since 1997. Increases in production and imports coupled with a decrease in exports led to an 11% increase in apparent consumption.

The principal use of potash is as an agricultural fertilizer (plant nutrient) because it is a source of soluble potassium. It is one of the three primary plant nutrients required for plant growth and maturation (the others are fixed nitrogen and soluble phosphorus). Potash and phosphorus are mined products, and fixed nitrogen is produced from the atmosphere by using industrial processes. Modern agricultural practice uses large amounts of these primary nutrients plus additional nutrients, such as boron, calcium, chlorine, copper, iron, magnesium, manganese, molybdenum, sulfur, and zinc, to ensure plant health and proper maturation. The three major plant nutrients have no cost-effective substitutes. Low-nutrient-content alternative sources, such as animal manure and guano, bone meal, compost, glauconite, and "tankage" from slaughterhouses, are available, but the cost of transportation per metric ton of nutrient can reduce their desirability beyond relatively short distances. In addition to its use as a fertilizer, potassium chloride is important in industrialized economies where it is used in aluminum recycling. It is also used by the chloralkali industry to produce potassium hydroxide, in metal electroplating, oil-well drilling mud, snow and ice melting, steel heat-treating, and water softening.

Potassium hydroxide is used for industrial water treatment and is the precursor of potassium carbonate, several forms of potassium phosphate, many other potassic chemicals, and in soap manufacturing. The glass industry uses potassium carbonate for television and computer monitor production. Potassium carbonate is used to produce animal feed supplements, cement, some types of fire extinguishers, food products, photographic chemicals, and textiles. It is also used in brewing beer, pharmaceutical preparations, and as a catalyst for synthetic rubber manufacturing. Generally, these nonfertilizer uses have accounted for about 15% of annual potash consumption in the United States.

According to the Potash & Phosphate Institute, agricultural and industrial MOP shipments to the 10 leading consuming States represented 65% of the combined Canadian and United States producers' total sales to the United States in 2004 (table 3). In decreasing order of tonnage, the States were Illinois, Iowa, Ohio, Indiana, Minnesota, Missouri, Alabama, Wisconsin, Michigan, and Texas. Agricultural MOP shipments to the 10 leading consuming States represented 66% of the Canadian and United States producers' agricultural MOP sales to the United States. In decreasing order of tonnage, the States were Illinois, Iowa, Indiana, Minnesota, Missouri, Ohio, Wisconsin, Michigan, Tennessee, and Florida. There was no change in the order of the 10 leading consuming States when compared to 2003, and there has been no change in the top 3 States in the past 5 years. All of the top 10 States saw an increase in MOP consumption with the largest increase of 15% in Minnesota. Industrial (nonagricultural) MOP shipments to the 10 leading consuming States represented 84% of combined Canadian and United States producers' industrial MOP sales to the United States. In decreasing order of tonnage, the States were Alabama, Ohio, Wisconsin, Utah, Texas, Delaware, New Mexico, Illinois, Colorado, and California. There was no change in the order of the first nine States when compared to 2003; however, California replaced Florida in the tenth position. All the top 10 States saw an increase in consumption of MOP with the average being a 27% increase. California saw an 89% increase in consumption from that of 2003.

Agricultural and industrial MOP sales to the five leading consuming States represented 57% of the U.S. producers' domestic total sales. In decreasing order of tonnage, the States were Texas, Missouri, Illinois, Michigan, and New Mexico. Agricultural MOP sales to the five leading consuming States represented 59% of the U.S. producers' domestic agricultural MOP sales. In decreasing order of tonnage, the States were Missouri, Illinois, Texas, Michigan, and California. Industrial MOP sales for 2004 to the five leading consuming States represented 76% of the producers' U.S. domestic industrial MOP shipments. In decreasing order of tonnage, the States were Texas, New Mexico, Colorado, Utah, and California.

Foreign Trade

U.S. exports of potash have been decreasing during the past 10 years, with the greatest decrease of 29% to about 235,000 t in 2004 of that, 48% was MOP, 36% was SOPM, 15% was SOP, and 1% was NOP (table 6). Mexico, Canada, Japan, Venezuela, and Costa Rica, in declining order, represented 57% of the U.S. exports of total potash, and all decreased their shipments compared with those in 2003 (table 7). Of the total quantity of exports by world region, 68% went to the Central America and South America, 18% went to the Asia Pacific region, 12% went to Canada, and the remaining 2% went to Europe, the Middle East, and Africa. Exports of MOP to all regions declined by 30%, SOP declined by 58%, SOPM increased by 5%, and NOP decreased by 10% (table 6). Central America and South America received about 92% of all MOP exports which represented 39% of the total potash exports to the region. Overall exports to Central America and South America declined by 10% compared with those of 2003, of which MOP declined by 29%, SOP (including potassium magnesium sulfate) increased by 6%, and NOP declined by 24%. Exports to the Asia Pacific region declined by 37%, of which MOP declined by 60%, SOP declined by 34%, and NOP declined by 9%. Exports to Canada declined by about 17% of which MOP declined by 26%, SOP declined by 17%, and NOP declined by 11%.

Potash imports into the United States for 2004 rose by about 4% to 4.92 Mt compared to those in 2003 (table 8). MOP imports rose by 5% to 4.81 Mt, and SOPM imports climbed by 89% to 5,870 t. Overall imports to the United States increased, but SOP

and NOP imports declined by 12% and 27% respectively. Total potash imports from Canada for 2004 rose by about 5% compared with those in 2003. Canada supplied about 92% of the MOP imports to the United States and 90% of all imports (table 9). Chile was the leading supplier of NOP with 89% of the imports but was second to Israel in the supply of SOPM with only 39% of the imports. Israel sold 57% of the SOPM imported into the United States, and Germany provided 62% of the SOP imported.

Transportation

Marine transportation costs increased significantly in 2003 and again in 2004. By the end of June 2003, the daily Baltic dry index (BDI), considered the broadest measure of the overall dry bulk freight market, started to increase to record levels. The increased Chinese demand in 2003 for the raw materials for steelmaking and supplemental steel imports for the country's booming economy was part of the driving force behind increased marine transportation costs (Hayley-Bell, 2003). The daily BDI saw a 137% spike from mid-September 2003 to its all-time high in early February 2004. It fell from that peak, though, and by mid-July, was 29% lower than the level reached earlier in the year. This downward correction came as China worked to moderate its growing economy, reducing pressure on the world's shipping industry. China's effectiveness at regulating its growth enabled it to avoid further restrictions, triggering a BDI rebound as summer began (Potash Corporation of Saskatchewan, Inc., 2005, p. 26). In December, the daily BDI hit a its highest peak, which was double the level seen in July. The index quickly dropped towards the end of December to a level lower than that at the end of 2003.

World Review

Estimated 2004 world potash production increased slightly by 2% to 29 Mt in 2004 (table 10). Western European production was estimated to have decreased by 3%, and production in all countries in the area declined slightly. The potash-producing countries of Eastern Europe—Belarus, Russia, and Ukraine—were estimated to have increased their combined total production by 4% to 9.4 Mt of K_2O equivalent compared with that of 2003. North American production saw a slight increase of 2% to 10.4 Mt of K_2O equivalent. Production in Brazil and Chile was estimated to have decreased by 7,000 t to 700,000 t of K_2O equivalent from that of 2003. The potash-producing countries of the Middle East—Israel and Jordan—were estimated to have increased production to about 3.3 Mt of K_2O equivalent for a 3% increase from the 2003 production level. The sole potash producer of the Asia Pacific region—China—was estimated to have increased production to about 550,000 t of K_2O equivalent 10% higher than 2003.

China, Israel, and Russia were the only countries to have had increased their production every year since 2000. Their total combined production increased by 31% from 2000 levels. The top five producing countries in 2004 all saw a slight increase in potash production compared with that of 2003. The total combined production level of the top five countries was 10% higher than the 2000 production level.

Potash Corporation of Saskatchewan, Inc. (PotashCorp) stated that increased consumption has significantly tightened world supplies after 20 years of oversupply of the potash market (Green Markets, 2004e). In 2004, PotashCorp currently held 86% of the world's excess capacity, up from 69% in 2003. Most other potash producers worldwide operated at full capacity in 2004, trying to fulfill the increase in demand.

European Union.—At the end of April, 10 new states joined the European Union (EU), which was made up of 15 European countries. The 10 new members (EU-10) were Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. It was expected that the new union would impact fertilizers sold from producers in Belarus, Russia, and Ukraine because sales to countries of the EU-10, which paid no tariffs, would now be subject to tariffs and antidumping duties. Potash traded in the expanded EU between member countries will no longer carry antidumping duties and can be traded freely (Fertilizer Week, 2004e).

Argentina.—Companhia Vale do Rio Doce (CVRD) was the successful bidder to explore potash in Argentina's Neuquen Province. CVRD has the next 2 years to research, evaluate, and explore a 454-square-kilometer section of the potash deposit. If the project is feasible, then it will provide potash production directly to Argentine and Brazilian markets (Fertilizer Week, 2004c).

Brazil.—In 2004, fertilizer imports from January to September increased by 18% compared to the same period in 2003. The most significant increases were seen in potash imports, which increased by 26% to about 5 Mt (Fertilizer Week, 2004a).

Canada.—In December, PotashCorp through its dealings with Israel Chemicals Ltd. (ICL) took ownership of 24.99% of the total outstanding shares of Sociedad Química y Minera de Chile S.A. (SQM). PotashCorp's increased ownership of SQM expanded the extended enterprise that already included a 9% investment in ICL in Israel and 26% of Arab Potash Co. (APC) in Jordan. In 2004, PotashCorp sold 8.3 Mt of potash, setting North American and offshore sales records (Potash Corporation of Saskatchewan Inc., 2005, p. 4).

Chile.—In June, SQM implemented a series of projects to increase its specialty fertilizers production capacity. Increases in potassium nitrate demand worldwide have translated in sustained increases in sales volume. In order to meet the demand, SQM increased its production capacity for potassium nitrate by 30%. A new potassium nitrate production facility was constructed at the Nueva Victoria facility. Also in 2004, construction of a new potassium nitrate granular facility was started that will complement current prilling plants. The new facility will allow SQM to increase its production capacity and to develop new specialty fertilizer blends (Green Markets, 2004g).

China.—In September, five producers formed a consortium to jointly import MOP and SOP into China. The import consortium planned to import an estimated 800,000 t to 1 Mt potash for manufacturing. Under China's import policy, non-state produced potash can only be used in the manufacturing of NPK fertilizer, and not for direct distribution. The five companies were Sino-Arab Chemical Fertilizers Co. Ltd., Shandong Luxi Chemical Co. Ltd., Liaoning Xiyang Tefei Co Ltd., Lubei General Company of Enterprise Group, and Hubei Yangfeng Stock Co. Ltd. (Fertilizer Week, 2004b).

In November, PotashCorp announced that Sinochem Corp. in China had signed a 2005 contract with Canpotex Ltd. The contract was for 1.5 Mt red standard-grade potash (Green Markets, 2004a).

This agreement was expected to increase China's potash imports from Canada to 2.3 Mt from 1.8 Mt at prices at least $40 per metric ton higher compared with the past contract price. Canpotex has also contracted for the sale of 0.3 Mt of white standard-grade potash at a $43-per-ton price increase compared with the past contract price. China's total consumption in 2005 will rival that of the United States, historically the world's leading potash consumer (Potash Corporation of Saskatchewan, Inc., 2005 p. 7).

Germany.—K+S Kali GmbH acquired a major part of Société des Potasses et de l'Azote (SCPA) of France. The deal will reinforce the position of K+S in the potash sector of France, Europe's leading fertilizer market. About 17% of K+S's total sales for 2003 were in France with the largest portion coming from potash (Chemical Market Reporter, 2004). K+S Kali started sylvinite extraction at Unterbreizbach in October. Sylvinite extraction will enhance the competitiveness of the Werra mining group and its processing facilities, which contribute more than 40% of the total output of K+S Kali (Fertilizer Week, 2004d).

Israel.—In 2004, ICL was the world's fifth ranked producer of potash and ranked second in sales in Western Europe. ICL accounted for 11% of world potash production, 13% of international potash trade (excluding the cross-border trade between the United States and Canada), and 10% of international potash trade. In December, ICL Group reached an agreement with PotashCorp to sell all its holdings of the subsidiary in the Cayman Islands. The subsidiary indirectly held shares in SQM (Potash Corporation of Saskatchewan, Inc., 2005, p. 37).

Russia.—Uralkali announced plans to directly market potash worldwide in 2005. Sales will be conducted through its wholly owned subsidiary Uralkali Trading SA. The Swiss-based trading company will be in charge of marketing and selling the production of the potash company all over the world. Uralkali also announced in December that it had set a record in the domestic potash industry. Production of potash reached 5 Mt in 2004, which was a 14% increase from that in 2003 (Fertilizer Week, 2004f).

Outlook

Factors affecting world economic growth include interest rates in the United States, China's foreign exchange policy, and global inflation. The world economic growth is forecast to increase by 4.3% for 2005 compared to 5% in 2004 (Potash Corporation of Saskatchewan, Inc., 2005, p. 46). The main driver in the growth of the potash market is expected to be rapid economic growth in many Asian, Central American, and South American nations. These increases are projected to support expenditures on fertilizer.

World demand for grain is expected to continue to expand in 2005. The record crops of 2004 in U.S. and Canada depleted soil nutrients that need to be replaced in 2005. Grain stocks are historically low and a second consecutive year of the ideal growing conditions that produced record crops in 2004 is unlikely. The U.S. Department of Agriculture recently estimated that at the end of the current crop year, there will be less than 3 months' supply of grain in world bins. China is expected to increase imports of grains from Brazil and the United States to make up its shortfall in grain output, driving agricultural output in those countries.

After harvesting the best crop in years in 2004, the world's farmers have an improved financial position entering 2005. This will support increased fertilizer consumption to replace nutrients drawn from the soil by the large crop, and help farmers achieve their production goals (Potash Corporation of Saskatchewan, Inc., 2005, p. 46). The global consumption is projected to be 30.3 Mt of potash in 2009, equating to a growth rate of 2% per year (International Fertilizer Industry Association, 2005, p. 22). This growth rate of 2 % suggests that 7 Mt of potash will be required worldwide.

There was a small amount of remaining excess capacity worldwide at yearend and there needs to significant growth in production capacity to meet the anticipated increase in demand. In the period from 2005 to 2009, potash capacity developments will take effect but will be localized in established producing countries. Triggered by strong demand projections, limited spare capacity, and firming international prices, most suppliers have announced expansion plans. Future potash developments could occur in Argentina, Canada, Congo, Russia and Thailand and most of the new capacity will be located in exporting countries. These projects have the possibility of adding more than 9.8 Mt of MOP capacity in the longer term (International Fertilizer Industry Association, 2005, p. 17-22).

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TABLE 1
SALIENT POTASH STATISTICS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

		2000	2001	2002	2003	2004
United States:						
Production:[3]						
Gross weight		2,600	2,500	2,600	2,400	2,700
K_2O equivalent		1,300	1,200	1,200	1,100	1,300
Sales by producers:						
Quantity:						
Gross weight[3]		2,600	2,400	2,500	2,500	2,700
K_2O equivalent[3]		1,200	1,100	1,200	1,200	1,300
Value[4, 5]		290,000	260,000	280,000	280,000	340,000
Average value:[6]						
Gross weight	dollars per metric ton	$110	$110	$110	$110	$125
K_2O equivalent	do.	$230	$230	$230	$230	$260
Exports:						
Gross weight		922	883	894	801	643
K_2O equivalent		367	366	371	329	235
Imports for consumption:[7, 8]						
Quantity:						
Gross weight		7,580	7,480	7,630	7,810	8,140
K_2O equivalent		4,600	4,540	4,620	4,720	4,920
Value, customs		554,000	537,000	615,000	646,000	763,000
Consumption, apparent:[9]						
Gross weight[10]		9,400	9,000	9,200	9,500	10,000
K_2O equivalent[10]		5,600	5,300	5,300	5,400	6,000
World, production, marketable K_2O equivalent		27,000	26,400 [r]	26,600 [r]	28,400 [r]	28,900 [e]

[e]Estimated. [r]Revised.

[1]Includes muriate of potash, sulfate of potash, potassium magnesium sulfate, and some parent salts. Excludes other chemical compounds that contain potassium.

[2]Data are rounded to no more than three significant digits unless otherwise specified.

[3]Data rounded to within 100,000 metric tons (t) to avoid disclosing proprietary data.

[4]Free on board mine.

[5]Data are rounded to no more than two significant digits.

[6]Rounded to the nearest $5 to avoid disclosing proprietary data.

[7]Excludes potassium chemicals and mixed fertilizers.

[8]Includes nitrate of potash.

[9]Calculated from sales plus imports minus exports.

[10]Data rounded to within 200,000 t to avoid disclosing proprietary data.

TABLE 2
PRODUCTION OF CRUDE ORE IN NEW MEXICO

(Thousand metric tons)

Period	Crude salts[1, 2] (mine production)	
	Gross weight	K_2O equivalent
2003:		
January-June	6,000	700
July-December	5,000	500
Total	11,000	1,200
2004:		
January-June	6,000	700
July-December	5,000	600
Total	11,000	1,300

[1]Sylvinite and langbeinite.
[2]Data are rounded to the nearest 1,000 t to avoid disclosing company proprietary data.

TABLE 3
SALES OF NORTH AMERICAN MURIATE OF POTASH, BY STATE OF DESTINATION[1]

(Metric tons of K_2O equivalent)

State	Agricultural potash		Nonagricultural potash	
	2003	2004	2003	2004
Alabama	75,900	76,500	209,000	236,000
Alaska	4,220	1,250	6,440	2,360
Arizona	2,290	2,730	3,080	3,020
Arkansas	75,900	73,200	24	56
California	68,400	78,100	9,310	17,600
Colorado	14,300	13,600	14,900	19,400
Connecticut	1,400	966	1,250	1,380
Delaware	19,100	22,100	43,000	47,200
Florida	138,000	141,000	13,300	13,400
Georgia	128,000	127,000	1,040	1,040
Idaho	32,500	46,200	1,030	1,620
Illinois	586,000	646,000	27,200	28,500
Indiana	335,000	361,000	10,000	14,800
Iowa	456,000	479,000	3,770	4,160
Kansas	38,500	32,300	8,260	9,120
Kentucky	113,000	138,000	5,080	8,780
Louisiana	72,600	83,500	2,510	6,920
Maine	4,190	4,880	368	347
Maryland	21,100	24,100	1,770	1,530
Massachusetts	3,320	2,350	12,600	8,010
Michigan	172,000	189,000	9,380	9,110
Minnesota	301,000	345,000	10,500	9,330
Mississippi	44,000	46,100	191	254
Missouri	294,000	320,000	2,440	2,630
Montana	19,300	20,400	168	96
Nebraska	61,700	60,800	2,100	1,960

See footnotes at end of table.

TABLE 3—Continued
SALES OF NORTH AMERICAN MURIATE OF POTASH, BY STATE OF DESTINATION[1]

(Metric tons of K_2O equivalent)

State	Agricultural potash		Nonagricultural potash	
	2003	2004	2003	2004
Nevada	--	558	182	158
New Hampshire	479	357	280	108
New Jersey	7,090	7,770	1,270	1,290
New Mexico	13,800	18,800	31,800	35,600
New York	53,800	56,800	4,300	3,700
North Carolina	109,000	130,000	523	837
North Dakota	34,900	38,100	99	24
Ohio	278,000	315,000	96,800	105,000
Oklahoma	28,700	36,400	5,620	5,640
Oregon	37,700	43,900	380	201
Pennsylvania	48,500	59,600	11,300	8,290
Rhode Island	--	--	13	24
South Carolina	48,700	61,000	72	98
South Dakota	24,600	23,100	298	200
Tennessee	145,000	148,000	5,570	10,600
Texas	112,000	114,000	47,700	67,400
Utah	3,180	2,620	55,600	82,200
Vermont	2,910	2,870	145	30
Virginia	76,800	87,600	1,170	1,320
Washington	42,100	46,200	1,430	565
West Virginia	2,980	1,670	1,130	970
Wisconsin	203,000	205,000	82,400	97,200
Wyoming	2,640	2,570	7,330	5,010
Total	4,360,000	4,740,000	754,000	875,000

-- Zero.

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

Source: Potash & Phosphate Institute.

TABLE 4
SALES OF NORTH AMERICAN MURIATE
OF POTASH TO U.S. CUSTOMERS, BY GRADE[1]

(Thousand metric tons of K_2O equivalent)

Grade	2003	2004
Agricultural:		
Standard	144	173
Coarse	2,220	2,390
Granular	1,590	1,710
Soluble	407	463
Total	4,360	4,740
Nonagricultural:		
Soluble	152	699
Other	603	176
Total	754	875
Grand total	5,110	5,610

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

Source: Potash & Phosphate Institute.

TABLE 5
PRICES OF U.S. POTASH, BY TYPE AND GRADE[1, 2]

(Dollars per metric ton of K_2O equivalent)

Type and grade	2003		2004	
	January-June	July-December	January-June	July-December
Muriate, 60% K_2O minimum:				
Standard	165	175	170	190
Granular	155	155	195	225

[1]Average prices, free on board mine, based on sales.
[2]Data rounded to nearest $5.

TABLE 6
U.S. EXPORTS OF POTASH, BY TYPE[1]

	Approximate average K_2O equivalent content (percentage)	Quantity (metric tons)	
		Gross weight	K_2O equivalent[e]
2003:			
Potassium chloride, all grades	61	268,000	163,000
Potassium sulfate	51	162,000	82,400
Potassium magnesium sulfate	22	365,000	80,300
Potassium nitrate	45	6,020	2,710
Total	XX	801,000	329,000
2004:			
Potassium chloride, all grades	61	187,000	114,000
Potassium sulfate	51	68,100	34,700
Potassium magnesium sulfate	22	383,000	84,200
Potassium nitrate	45	5,390	2,430
Total	XX	643,000	235,000

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

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey.

TABLE 7
U.S. EXPORTS OF POTASH, BY COUNTRY[1]

(Metric tons of product)

Country	Potassium chloride		Potassium sulfates, all grades[2]		Potassium nitrate		Total	
	2003	2004	2003	2004	2003	2004	2003	2004
Argentina	18	19	4,670	5,490	--	--	4,690	5,510
Australia	--	--	15,900	14,100	30	--	15,900	14,100
Barbados	800	1,150	200	180	16	--	1,020	1,330
Belize	2,820	1,940	--	6	--	--	2,820	1,950
Brazil	15,800	--	3,150	5,410	64	7	19,000	5,420
Canada	5,780	4,260	89,000	74,000	1,720	1,540	96,500	79,800
Chile	36	86	17,600	29,900	--	--	17,600	30,000
China	--	--	45,600	25,600	--	20	45,600	25,700
Colombia	4,550	126	23,600	24,100	7	4	28,200	24,300
Costa Rica	20,100	1,980	31,700	39,300	--	--	51,800	41,300
Cote d'Ivoire	12,500	--	18,300	--	--	--	30,800	--
Dominican Republic	24,800	21,100	10,600	14,900	2,440	4	37,800	36,000
Ecuador	7	7,020	13,700	5,500	--	--	13,700	12,500
El Salvador	3	4,200	--	2,100	--	--	3	6,300
France	2	--	37	32	3	--	42	32
Guadeloupe	--	--	3,200	--	--	--	3,200	--
Guatemala	58	9,930	2,910	6,810	--	--	2,970	16,700
Honduras	18	4,220	2,610	11,000	--	--	2,630	15,300
Indonesia	--	--	--	5,500	--	--	--	5,500
Jamaica	13,900	10,600	--	--	24	7	13,900	10,600
Japan	23,500	9,390	77,400	49,600	--	--	101,000	59,000
Korea, Republic of	--	--	19,300	93	7	16	19,300	109
Malaysia	--	--	10	7,900	--	--	10	7,900
Martinique	19,100	8,300	3,190	805	--	--	22,300	9,110
Mexico	57,200	60,300	82,700	70,100	951	2,640	141,000	133,000
New Zealand	--	--	1,990	5,010	--	--	1,990	5,010
Nicaragua	6,000	2,670	--	1,400	19	--	6,020	4,070
Panama	4,180	12,600	1,160	1,690	--	--	5,330	14,200
Peru	13	30	37,500	14,200	--	--	37,500	14,200
South Africa	--	--	--	3,260	--	--	--	3,260
Suriname	--	800	--	718	--	--	--	1,520
Thailand	--	--	3,300	--	--	--	3,300	--
Trinidad and Tobago	650	1,500	39	--	--	--	689	1,500
Venezuela	55,700	24,100	16,400	30,600	--	--	72,100	54,700
Other	644 r	808	855 r	1,340	736 r	1,160	2,240 r	3,310
Total	268,000	187,000	527,000	451,000	6,020	5,390	801,000	643,000

rRevised. -- Zero.

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

[2]Includes potassium magnesium sulfate.

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF POTASH, BY TYPE[1]

	Approximate average K_2O equivalent content (percentage)	Quantity (metric tons)		Value (thousands)	
		Gross weight	K_2O equivalent[e]	Customs	C.i.f.[2]
2003:					
Potassium chloride[3]	61	7,510,000	4,580,000	$577,000	$602,000
Potassium sulfate	51	122,000	62,000	21,900	24,600
Potassium nitrate	45	159,000	71,400	42,300	48,500
Potassium sodium nitrate mixture	14	22,200	3,110	4,170	4,870
Total	XX	7,810,000	4,720,000	646,000	679,000
2004:					
Potassium chloride[3]	61	7,880,000	4,810,000	697,000	720,000
Potassium sulfate	51	107,000	54,500	21,200	24,800
Potassium nitrate	45	116,000	52,400	32,900	36,900
Potassium sodium nitrate mixture	14	41,900	5,870	11,800	14,800
Total	XX	8,140,000	4,920,000	763,000	796,000

[e]Estimated. XX Not applicable.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, and freight.
[3]Contains imports listed under Harmonized Tariff Schedule of the United States code 3104.10.0000.

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey.

TABLE 9
U.S. IMPORTS FOR CONSUMPTION OF POTASH, BY COUNTRY[1]

	Potassium chloride (metric tons)		Potassium sulfate (metric tons)		Potassium nitrate (metric tons)		Potassium sodium nitrate (metric tons)		Total					
									Quantity (metric tons)		Value (thousands)			
											Customs		C.i.f.[2]	
Country	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Belarus	394,000	493,000	--	--	--	--	--	--	394,000	493,000	$33,400	$58,500	$38,300	$67,200
Belgium	--	11	13,100	10,400	--	--	--	--	13,100	10,400	1,720	2,440	2,140	2,710
Brazil	460	--	--	--	--	--	--	--	460	--	69	--	93	--
Canada	6,930,000	7,280,000	25,200	18,300	--	--	593	1,240	6,960,000	7,300,000	535,000	633,000	552,000	645,000
Chile	50	166	14,200	11,400	114,000	104,000	21,600	16,500	128,000	132,000	30,400	32,800	34,000	36,500
China	--	--	--	--	686	36	--	--	686	36	376	16	414	22
Denmark	--	--	19	--	7,050	2,250	--	38	7,070	2,290	2,110	668	2,950	973
France	--	--	130	202	--	--	--	--	130	202	148	222	158	258
Germany	804	12,500	68,800	66,400	1,630	1,870	--	--	71,300	80,800	12,700	13,600	14,200	17,000
Hong Kong	--	--	--	--	29	--	--	--	29	--	10	--	16	--
India	--	--	--	2	90	57	--	--	90	59	42	47	49	51
Israel	163	226	--	--	34,100	7,350	--	24,100	34,300	31,700	14,500	12,000	17,100	15,000
Japan	--	--	--	137	839	1,020	--	--	839	1,160	262	445	282	506
Mexico	--	--	--	--	169	--	--	--	169	--	75	--	84	--
Netherlands	318	130	--	--	29	--	--	--	347	130	53	2	59	3
Norway	10	--	--	--	--	--	--	--	10	--	2	--	3	--
Poland	--	--	--	--	46	198	--	--	46	198	15	73	19	83
Russia	182,000	91,500	--	--	--	--	--	--	182,000	91,500	14,700	8,720	17,300	11,100
Spain	--	--	--	--	--	13	--	--	--	13	--	12	--	15
Sweden	--	--	18	--	--	--	--	--	18	--	5	--	7	--
United Kingdom	102	90	--	--	--	--	--	49	102	139	131	160	150	229
Total	7,510,000	7,880,000	122,000	107,000	159,000	116,000	22,200	41,900	7,810,000	8,140,000	646,000	763,000	679,000	796,000

See footnotes at end of table.

TABLE 9—Continued
U.S. IMPORTS FOR CONSUMPTION OF POTASH, BY COUNTRY[1]

-- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Cost, insurance, and freight.

Source: U.S. Census Bureau, as adjusted by the U.S. Geological Survey.

TABLE 10
MARKETABLE POTASH: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons of K_2O equivalent)

Country	2000	2001	2002	2003	2004[e]
Belarus[e]	3,786 [3]	3,700	3,800	4,230	4,300
Brazil	352	319	337	337 [r]	340
Canada	9,202	8,237 [r]	8,361 [r]	9,131 [r]	9,150
Chile	330 [r]	390 [r]	350 [r, e]	370 [r]	360
China[e]	380	385	450	500	550
France[e]	320 [3]	244	130	--	--
Germany[e]	3,407 [3]	3,550	3,450	3,600	3,500
Israel	1,750	1,770	1,920	1,960 [r]	2,060
Jordan	1,160	1,180	1,170	1,230	1,230
Russia[e]	3,700	4,300	4,400	4,740	5,000
Spain[e]	653 [3]	471	407	510	500
Ukraine[e]	85	75	60	60 [r]	50
United Kingdom[e]	600	532	540	620	600
United States[e, 4]	1,300 [3]	1,200	1,200	1,100	1,300
Total	27,000	26,400 [r]	26,600 [r]	28,400 [r]	28,900

[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 April 24, 2005.
[3]Reported figure.
[4]Rounded to within 100,000 metric tons to avoid disclosing proprietary data.