

## POTASH

(Data in thousand metric tons of K<sub>2</sub>O equivalent unless otherwise noted)

**Domestic Production and Use:** In 2010, the production value of marketable potash, f.o.b. mine, was about \$540 million. Potash was produced in Michigan, New Mexico, and Utah. Most of the production was from southeastern New Mexico, where two companies operated three mines. New Mexico sylvinitic and langbeinitic ores were beneficiated by flotation, dissolution-recrystallization, heavy-media separations, or combinations of these processes, and provided more than 75% of total U.S. producer sales. In Utah, which has three operations, one company extracted underground sylvinitic ore by deep-well solution mining. Solar evaporation crystallized the sylvinitic ore from the brine solution, and a flotation process separated the potassium chloride (muriate of potash or MOP) from byproduct sodium chloride. Two companies processed surface and subsurface brines by solar evaporation and flotation to produce MOP, potassium sulfate (sulfate of potash or SOP), and byproducts. In Michigan, one company used deep-well solution mining and mechanical evaporation for crystallization of MOP and byproduct sodium chloride.

The fertilizer industry used about 85% of U.S. potash sales, and the chemical industry used the remainder. More than 60% of the produced potash was MOP. Potassium magnesium sulfate (sulfate of potash-magnesia or SOPM) and SOP, which are required by certain crops and soils, also were produced.

<b>Salient Statistics—United States:</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010<sup>e</sup></b>
Production, marketable <sup>1</sup>	1,100	1,100	1,100	700	900
Imports for consumption	4,470	4,970	5,800	2,220	4,700
Exports	332	199	222	303	380
Consumption, apparent <sup>1</sup>	5,200	5,900	6,700	2,600	5,200
Price, dollars per metric ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>2</sup>	375	400	675	835	600
Employment, number:					
Mine	480	480	525	510	540
Mill	620	580	615	640	650
Net import reliance <sup>3</sup> as a percentage of apparent consumption	79	81	84	73	83

**Recycling:** None.

**Import Sources (2006–09):** Canada, 87%; Belarus, 5%; Russia, 5%; and other, 3%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b>12-31-10</b>
	Potassium nitrate	2834.21.0000	Free.
	Potassium chloride	3104.20.0000	Free.
	Potassium sulfate	3104.30.0000	Free.
	Potassic fertilizers, other	3104.90.0100	Free.
	Potassium-sodium nitrate mixtures	3105.90.0010	Free.

**Depletion Allowance:** 14% (Domestic and foreign).

**Government Stockpile:** None.

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**Events, Trends, and Issues:** In 2009, U.S. production was at its lowest point since 1943, and consumption was at the lowest point since 1962. World production was at its lowest level since 1993. In 2010, world potash markets began to recover after potash sales had collapsed from the combined effects of the world economic downturn, high prices, and weak demand.

The leading U.S. potash producer continued work on converting a closed underground mine into a solution mine. The company anticipated starting operations in late 2012, pending regulatory approvals. Another company planned to complete expansion of its solar evaporation ponds along the Great Salt Lake, Utah, in 2011 to increase production capacity of SOP. North Dakota issued its first potash exploration permit since 1976. The U.S. mining company would use solution mining methods to recover the potash because the deposits in North Dakota are too deep to use conventional underground mining techniques economically.

Plans were in place to increase world production capacity by 28%, from 42.9 million tons in 2010 to 54.7 million tons in 2014, with expansions of existing operations in Canada and Russia and new projects in Argentina, Belarus, Canada, Chile, China, Congo (Brazzaville), and Laos. In 2010, a major international mining company unsuccessfully bid to acquire the leading potash producer in Canada and the world. In November, the international company abandoned its attempt 10 days after the Canadian Government ruled that the sale of the potash company would not be in the best interest of Canada.

**World Mine Production and Reserves:** Reserves data for the United States, Chile, and Germany were updated using information published by the producers in the respective countries. For Germany, reserves are listed as exploitable reserves by the producing company. Reserves for China and Russia were updated from official Government sources from those countries and may not be exactly comparable to the reserve definition in Appendix C.

	Mine production		Reserves <sup>4</sup>
	2009	2010 <sup>e</sup>	
United States	<sup>1</sup> 700	<sup>1</sup> 900	130,000
Belarus	2,490	5,000	750,000
Brazil	385	400	300,000
Canada	4,320	9,500	4,400,000
Chile	692	700	70,000
China	3,000	3,000	210,000
Germany	1,800	3,000	150,000
Israel	2,100	2,100	<sup>5</sup> 40,000
Jordan	683	1,200	<sup>5</sup> 40,000
Russia	3,730	6,800	3,300,000
Spain	435	400	20,000
Ukraine	12	12	25,000
United Kingdom	427	400	22,000
Other countries	—	—	50,000
World total (rounded)	20,800	33,000	9,500,000

**World Resources:** Estimated domestic potash resources total about 7 billion tons. Most of these lie at depths between 1,800 and 3,100 meters in a 3,110-square-kilometer area of Montana and North Dakota as an extension of the Williston Basin deposits in Saskatchewan, Canada. The Paradox Basin in Utah contains resources of about 2 billion tons, mostly at depths of more than 1,200 meters. The Holbrook Basin of Arizona contains resources of about 1 billion tons. A large potash resource lies about 2,100 meters under central Michigan. The U.S. reserves figure above includes approximately 40 million tons in central Michigan. Estimated world resources total about 250 billion tons.

**Substitutes:** There are no substitutes for potassium as an essential plant nutrient and an essential nutritional requirement for animals and humans. Manure and glauconite (greensand) are low-potassium-content sources that can be profitably transported only short distances to the crop fields.

<sup>e</sup>Estimated. — Zero.

<sup>1</sup>Data are rounded to no more than two significant digits to avoid disclosing company proprietary data.

<sup>2</sup>Average prices based on actual sales; excludes soluble and chemical muriates.

<sup>3</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>4</sup>See Appendix C for resource/reserve definitions and information concerning data sources.

<sup>5</sup>Total reserves in the Dead Sea are arbitrarily divided equally between Israel and Jordan for inclusion in this tabulation.