

## POTASH

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

**Domestic Production and Use:** In 2013, the production value of marketable potash, f.o.b. mine, was about \$649 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 sylvinites and langbeinites ores were beneficiated by flotation, dissolution-recrystallization, heavy-media separation, 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 sylvinites ore by deep-well solution mining. Solar evaporation crystallized the sylvinites 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 facility was closed in November, as the operating company focused on its larger potash mines in New Mexico and Saskatchewan, Canada.

The fertilizer industry used about 85% of U.S. potash sales, and the chemical industry used the remainder. More than 60% of the potash produced 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>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013<sup>e</sup></b>
Production, marketable <sup>1</sup>	720	930	1,000	900	970
Sales by producers, marketable <sup>1</sup>	630	1,000	990	980	880
Imports for consumption	2,220	4,760	4,980	4,240	4,750
Exports	303	297	202	234	180
Consumption: <sup>1, 2</sup>	2,500	5,500	5,800	5,000	5,500
Price, dollars per metric ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>3</sup>	800	630	745	765	740
Employment, number:					
Mine	610	650	660	750	770
Mill	700	700	620	740	770
Net import reliance <sup>4</sup> as a percentage of apparent consumption	73	83	83	82	82

**Recycling:** None.

**Import Sources (2009–12):** Canada, 85%; Russia, 10%; Israel, 2%, Chile 2%, and other, 1%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–13</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.

**Events, Trends, and Issues:** Domestic sales of potash decreased from those of 2012 because of delayed fall fertilizer applications and the uncertainty of prices in the second half of the year.

In July 2013, the leading Russian potash producer dissolved its marketing affiliation with the only Belarus potash producer. Following the breakup, potash prices dropped by nearly 30% worldwide, as lower selling prices by the Russian producer forced other companies to lower prices to remain competitive. Potash sales decreased worldwide in last half of 2013, as many buyers waited for a significant drop in prices.

In New Mexico, a new solar solution mine began pumping enriched brine into evaporation ponds and initial potash production was expected by early 2014. The company expected to complete construction of the processing facility at the mine in 2014 and to start full production of 150,000 to 200,000 per year in the second half of 2015.

## POTASH

A Canadian company continued development of a new underground potash mine in southeastern New Mexico. The company plans to produce only SOP and SOPM. Initial production was expected to begin in 2016, with annual production of 568,000 tons of SOP and 275,000 tons of SOPM.

In 2013, progress continued in the development of new mines and expansion of existing facilities in more than 15 countries worldwide. Projects in Canada, Laos, and Russia were expected to be completed by 2017. Other important projects in Belarus, Brazil, Congo (Brazzaville), Eritrea, Ethiopia, Russia, Turkmenistan, United Kingdom, and Uzbekistan were not expected to be operational until after 2018.

World consumption of potash, for all applications, was expected to increase by about 3% per year over the next several years.

**World Mine Production and Reserves:** Reserves for Belarus were revised using official Government sources and may not be comparable to the reserves definition in Appendix C. Belarus reserves are in terms of gross tonnage only. Previously, Russian reserves were reported using only Russian reserve system criteria. Recently, Russian producers began reporting reserves that have been revised to the K<sub>2</sub>O content of JORC potash reserves as reported by producers. Additionally, the leading Russian producer changed its reserves to reflect only properties that were planned to be mined in the next 20 years. Previously, the potash reserve estimate for Canada contained data in terms of K<sub>2</sub>O content and gross tonnage. Canadian reserve estimates were revised to reflect the K<sub>2</sub>O content for proven and probable reserves. U.S. reserves were revised to account for reported data from projects under development.

	Mine production		Reserves <sup>5</sup>
	2012	2013 <sup>e</sup>	
United States <sup>1</sup>	900	970	200,000
Belarus	4,760	4,900	3,300,000
Brazil	425	425	300,000
Canada (K <sub>2</sub> O content)*	8,980	10,500	1,000,000
Chile	1,050	1,100	150,000
China	4,100	4,300	210,000
Germany	3,120	3,000	140,000
Israel	1,900	2,000	<sup>6</sup> 40,000
Jordan	1,090	1,200	<sup>6</sup> 40,000
Russia (K <sub>2</sub> O content)*	5,470	5,300	600,000
Spain	420	436	20,000
United Kingdom	470	470	22,000
Other countries	—	—	50,000
World total (rounded)	32,700	34,600	*6,000,000

**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 Manitoba and 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 0.7 to 2.5 billion tons. A large potash resource lies about 2,100 meters under central Michigan and contains more than 75 million tons. Estimated world resources total about 250 billion tons.

**Substitutes:** No substitutes exist 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>Defined as sales + imports – exports.

<sup>3</sup>Average prices based on actual sales; excludes soluble and chemical muriates.

<sup>4</sup>Defined as imports – exports.

<sup>5</sup>See Appendix C for resource/reserve definitions and information concerning data sources.

<sup>6</sup>Total reserves in the Dead Sea are arbitrarily divided equally between Israel and Jordan for inclusion in this tabulation.

\*Corrections posted on March 27, 2014.