

## POTASH

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

**Domestic Production and Use:** In 2015, the production value of marketable potash, f.o.b. mine, was about \$680 million. Potash was produced in New Mexico and Utah. Most of the production was from southeastern New Mexico, where two companies operated four mines. Sylvinite and langbeinite ores in New Mexico were beneficiated by flotation, dissolution-recrystallization, heavy-media separation, solar evaporation, or combinations of these processes, and provided more than 75% of total U.S. producer sales. In Utah, two companies operated three mines. One company extracted underground sylvinite ore by deep-well solution mining. Solar evaporation crystallized the sylvinite ore from the brine solution, and a flotation process separated the potassium chloride (muriate of potash or MOP) from byproduct sodium chloride. The firm also processed subsurface brines by solar evaporation and flotation to produce MOP at its other facility. Another company processed brine from the Great Salt Lake by solar evaporation to produce potassium sulfate (sulfate of potash or SOP) and byproducts.

The fertilizer industry used about 85% of U.S. potash sales, and the chemical industry used the remainder. About 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, accounted for the remaining 40% of production.

<b>Salient Statistics—United States:</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015<sup>e</sup></b>
Production, marketable <sup>1</sup>	1,000	900	960	850	770
Sales by producers, marketable <sup>1</sup>	990	980	880	930	760
Imports for consumption	4,980	4,240	4,650	4,970	4,000
Exports	202	234	289	118	30
Consumption, apparent <sup>1,2</sup>	5,800	5,000	5,200	5,800	4,700
Price, dollars per ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>3</sup>	730	710	640	580	635
Employment, number:					
Mine	660	750	760	670	600
Mill	620	740	770	660	620
Net import reliance <sup>4</sup> as a percentage of apparent consumption	83	82	82	85	84

**Recycling:** None.

**Import Sources (2011–14):** Canada, 84%; Russia, 9%; Israel, 3%; Chile, 2%; and other, 2%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b>12–31–15</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:** U.S. consumption, imports, production, and sales of potash were estimated to be lower in 2015 compared with those in 2014. Production decreased, owing in part to one company in New Mexico producing only SOPM after it ceased production of MOP at the mine at the end of 2014. In addition, the leading U.S. potash producer closed one mine in New Mexico for 15 days for maintenance issues. Consumption and imports were lower because many farmers postponed buying potash because of high inventories and anticipation of lower prices in the fourth quarter. The price of potash increased primarily because of higher prices in the first half of 2015. U.S. imports of potash account for more than 80% of consumption. Most of the imports are from Canada, which has the world's largest reserves and production capacity and lower production costs than in the United States.

The leading potash producer announced in late 2015 that it would stop production of MOP and only recover SOPM at one of its three mines in New Mexico. The company would use MOP from its lower cost solar solution mine, which began operating at normal levels in 2015, to replace MOP from the old mine.

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A Canadian company continued development of a new underground potash mine in southeastern New Mexico that would produce SOP only. The company planned to begin production in 2017 or 2018, with an annual production capacity of 714,000 tons of SOP.

Annual production capacity was projected to increase globally from 52 million tons in 2015 to 61 million tons in 2019. More than one-half of the new capacity would be from expansions of existing facilities in Belarus, Canada, China, and Russia. The remainder would be from new mines in Belarus, Canada, Russia, Turkmenistan, the United States, and Uzbekistan. In 2015, Belarus, Canada, China, and Russia accounted for 75% of world production and capacity and by 2019 could account for 80% of world production capacity. Other significant potash projects were under development in Australia, Brazil, Canada, Congo (Brazzaville), Eritrea, Ethiopia, Kazakhstan, Laos, Peru, Thailand, and the United Kingdom. None of these projects, however, were expected to be completed until after 2020.

In 2015, world consumption was estimated to have increased slightly over that of 2014, owing to higher fertilizer consumption in India and South America, which offset level consumption in the rest of the world. World consumption for all uses of potash was projected to increase gradually from 35.5 million tons K<sub>2</sub>O in 2015 to 39.5 million tons K<sub>2</sub>O in 2019. Asia and South America would account for most of the growth in consumption.

**World Mine Production and Reserves:** U.S. reserves were revised to reflect the closure of one mine in late 2013 and another ceasing production of MOP in 2014. Reserves for Brazil (K<sub>2</sub>O) were revised with official Government data. Reserves for Canada were reduced owing to one company revising its resource evaluation after completion of a new pilot plant study. Reserves for Israel and Jordan were revised to reflect the potassium content of the Dead Sea and the potential amount of potash that could be recovered.

	Mine production		Reserves <sup>5</sup>	
	2014	2015 <sup>e</sup>	Recoverable ore	K <sub>2</sub> O equivalent
United States <sup>1</sup>	850	770	1,500,000	120,000
Belarus	6,290	6,500	3,300,000	750,000
Brazil	311	311	300,000	13,000
Canada	11,000	11,000	4,200,000	1,000,000
Chile	1,200	1,200	NA	150,000
China	4,400	4,200	NA	210,000
Germany	3,000	3,000	NA	150,000
Israel	1,770	1,800	NA	<sup>6</sup> 270,000
Jordan	1,260	1,250	NA	<sup>6</sup> 270,000
Russia	7,380	7,400	2,800,000	600,000
Spain	715	700	NA	20,000
United Kingdom	610	610	NA	70,000
Other countries	50	50	250,000	90,000
World total (rounded)	38,800	38,800	NA	3,700,000

**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 as 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. NA. Not available.

<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 divided equally between Israel and Jordan for inclusion in this tabulation.