

POTASH

[Data in thousand metric tons of potassium oxide (K₂O) equivalent unless otherwise noted]

Domestic Production and Use: In 2022, the estimated sales value of marketable potash, free on board (f.o.b.) mine, was \$760 million, which was 38% higher than that in 2021. The majority of U.S. production was from southeastern New Mexico, where two companies operated two underground mines and one deep-well solution mine. Sylvinitic and langbeinite ores in New Mexico were beneficiated by flotation, dissolution-recrystallization, heavy-media separation, solar evaporation, and (or) combinations of these processes. In Utah, two companies operated three facilities. 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 muriate of potash (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 or sulfate of potash (SOP) and other byproducts.

Potash denotes a variety of mined and manufactured salts that contain the element potassium in water-soluble form. In agriculture, the term potash refers to potassic fertilizers, which are potassium chloride (KCl), SOP, and potassium magnesium sulfate (SOPM) or langbeinite. MOP is an agriculturally acceptable mix of KCl (95% pure or greater) and sodium chloride for fertilizer use. The fertilizer industry used about 85% of U.S. potash sales, and the remainder was used for chemical and industrial applications. About 70% of the potash produced was SOPM and SOP, which are required to fertilize certain chloride-sensitive crops. The remainder of production was MOP and was used for agricultural and chemical applications.

Salient Statistics—United States:	2018	2019	2020	2021	2022^e
Production, marketable ¹	520	510	460	480	440
Sales by producers, marketable ¹	520	480	500	490	440
Imports for consumption	5,710	5,150	5,370	6,480	7,000
Exports	105	145	147	112	300
Consumption, apparent ^{1, 2}	6,100	5,500	5,700	6,900	7,100
Price, average, f.o.b. mine, dollars per ton of K ₂ O equivalent:					
All products ³	750	820	850	1,120	1,700
MOP	440	480	450	650	1,000
Employment, mine and mill, number	900	900	900	900	900
Net import reliance ⁴ as a percentage of apparent consumption	92	91	92	93	94

Recycling: None.

Import Sources (2018–21): Canada, 79%; Russia, 9%; Belarus, 7%; and other, 5%.

Tariff:	Item	Number	Normal Trade Relations 12–31–22
	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.

Depletion Allowance: 14% (domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: In 2022, U.S. consumption was estimated to have increased by about 3% compared with that in 2021. World potash supply was affected by economic sanctions on Belarus and Russia and resulted in higher prices and lower consumption. World potash consumption in 2022 for fertilizers was estimated to have decreased to between 35 to 39 million tons from 40.6 million tons in 2021. In January 2022, the Government of Lithuania, citing national security concerns, cancelled the rail transport contract that allowed the state-run producer in Belarus to ship potash from the port of Klaipeda on the Baltic Sea, its only marine export facility. This followed the enactment of economic sanctions on Belarus in 2021 by the European Union (EU) and the United States, which banned the import of potash. Belarus was the third-leading potash supplier prior to 2022, shipping more than 6 million tons per year of K₂O equivalent. Some Belarus potash was shipped by rail through Russia to other countries in the region and from a Russian port later in the year, but exports and production of potash were significantly lower in 2022.

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Following Russian troops taking control of parts of eastern Ukraine in February, the EU, the United States, and other countries placed economic sanctions on Russia. Fertilizer products, including potash, were exempt; however, the EU placed import quotas on potash from Russia. United States sanctions on certain Russian companies, financial institutions, and individuals limited the amount of potash that could be imported. Russia responded by suspending fertilizer exports to countries that it deemed unfriendly. Russia continued exports to China, India, and some countries in Africa and South America, but its exports were about 30% lower in 2022 compared with those in 2021. As a result of the reduction in world supplies of potash, producers in Canada announced production increases over the next year by more than 600,000 tons of K₂O equivalent. Canadian production capacity was planned to increase by more than 3 million tons per year of K₂O equivalent by 2025. Production in other exporting countries was expected to increase as well.

A new potash mine was in the development stage in Osceola County, MI. The proposed solution mine would have an initial production capacity of 650,000 tons per year of MOP and was planned to increase up to 1 million tons per year of MOP. The company planned to start production in 2025.

World annual potash production capacity was projected to increase to about 66 million tons in 2025 from 64 million tons in 2022. Most of the increase would be MOP from new mines and expansion projects in Belarus, Canada, and Russia. New SOP mines were planned in Australia and Eritrea, and a polyhalite mine in the United Kingdom would also contribute to the capacity growth. New MOP mines in Brazil, Canada, Ethiopia, Morocco, Spain, and the United States were planned to begin operation past 2025.

World Mine Production and Reserves: Reserves for China were revised based on Government reports.

	Mine production		Reserves ⁵	
	2021	2022 ^e	Recoverable ore	K ₂ O equivalent
United States ¹	480	440	970,000	220,000
Belarus	^e 7,630	3,000	3,300,000	750,000
Brazil	270	270	10,000	2,300
Canada	14,200	16,000	4,500,000	1,100,000
Chile	858	850	NA	100,000
China	^e 6,000	6,000	NA	170,000
Germany	^e 2,800	2,800	NA	150,000
Israel	2,380	2,500	NA	⁶ Large
Jordan	1,560	1,700	NA	⁶ Large
Laos	^e 260	600	500,000	75,000
Russia	9,100	5,000	NA	400,000
Spain	365	450	NA	68,000
Other countries	350	350	1,500,000	300,000
World total (rounded)	46,300	40,000	>11,000,000	>3,300,000

World Resources:⁵ 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 materials that can be profitably transported only short distances to crop fields. Glauconite is used as a potassium source for organic farming.

^eEstimated. NA Not available.

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

²Defined as sales + imports – exports.

³Includes MOP, SOP, and SOPM. Does not include other chemical compounds that contain potassium.

⁴Defined as imports – exports.

⁵See Appendix C for resource and reserve definitions and information concerning data sources.

⁶Israel and Jordan recover potash from the Dead Sea, which contains nearly 2 billion tons of potassium chloride.