

## POTASH

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

**Domestic Production and Use:** In 1996, the value of production of marketable potash, f.o.b. mine was about \$275 million, owing to declining sales and prices. Domestic potash was produced in four States: New Mexico, Utah, California, and Michigan. The majority of the production occurred in southwestern New Mexico, where four companies operated five mines at the beginning of the year. These five mines were conventional underground mines of bedded deposits, which have projected lifetimes that range from about 10 years to more than 100 years at present prices. New Mexico potash ore was beneficiated by flotation, heavy media separation, dissolution-recrystallization, and washing, and provided about 80% of the U.S. total producer sales. In Utah, one company brought underground potash to the surface by solution mining. The potash was recovered from the brine by solar evaporation to crystals and flotation. Another Utah company collected subsurface brines from an interior basin for solar evaporation to crystals and flotation. A third Utah company collected lake brines for solar evaporation to crystals, flotation, and dissolution-recrystallization. In California, one company recovered potash and coproducts borax pentahydrate, soda ash, and saltcake from subsurface brines from an interior basin using mechanical evaporation. At the end of the first quarter, the company ceased potash production. In Michigan, a company used solution mining and recovery by mechanical evaporation.

The fertilizer industry accounted for more than 85% of the U.S. potash sales, and the chemical industry accounted for close to 15%. About 70% of the potash was produced as potassium chloride (muriate of potash). Potassium sulfate (sulfate of potash) and potassium magnesium sulfate (sulfate of potash-magnesia), required by certain crops and soils, composed about 25% of potash production. Potash was transported by train, truck, and barges to warehouses, wholesalers, and retailers, with some potash being sold from barges used as temporary warehouses. Retailers sold potash and potash blended with other fertilizers in dry or liquid form for distribution.

<b>Salient Statistics—United States:</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996<sup>e</sup></b>
Production, marketable	1,710	1,510	1,400	1,480	1,380
Imports for consumption	4,250	4,360	4,800	4,820	4,850
Exports	663	415	464	409	400
Consumption, apparent	5,350	5,430	5,810	5,810	5,840
Price, dollars per metric ton of K <sub>2</sub> O, average, muriate, f.o.b. mine <sup>1</sup>	134	128	131	137	133
Stocks, producer, yearend	283	305	234	312	300
Employment (number): Mine	1,000	795	845	900	880
Mill	1,180	910	810	840	810
Net import reliance <sup>2</sup> as a percent of apparent consumption	68	72	76	75	76

**Recycling:** None.

**Import Sources (1992-95):** Canada, 92%; Belarus, 2%; Russia, 2%; Israel, 2%; Germany, 1%; and other, 1%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Most favored nation (MFN) 12/31/96</b>	<b>Non-MFN<sup>3</sup> 12/31/96</b>
	Crude salts, sylvinitic, etc.	3104.10.0000	Free	Free.
	Potassium chloride	3104.20.0000	Free	Free.
	Potassium sulfate	3104.30.0000	Free	Free.
	Potassium nitrate	2834.21.0000	Free	Free.
	Potassium-sodium nitrate mixtures	3105.90.0010	Free	Free.

**Depletion Allowance:** 14% (Domestic), 14% (Foreign).

**Government Stockpile:** None.

**Events, Trends, and Issues:** The world remained in overcapacity at about the same rate as that of 1995. The Canadian potash industry operated at about 75% capacity, which was about 45% for the largest producer and about 90% for all the others; the Former Soviet Union producers operated at about 60% capacity. While capacity remained about the same as last year, Belarus, Canadian, German, and Russian mines were temporarily closed during the summer to augment less-than-full-capacity production schedules to reduce producer potash stocks to normal levels.

A large integrated U.S. fertilizer producer, with potash mines located in Saskatchewan and New Mexico, merged with a U.S. muriate of potash producer, with brine wells located in Saskatchewan and Michigan. The owner of a Carlsbad, NM, potash producer purchased two other Carlsbad potash mines and mills, and, at the end of the year, three

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companies operated five mines.

In June 1996, the U.S. Department of Justice, Antitrust Division, in Cleveland, OH, dropped its 3-year investigation of alleged antitrust actions (price fixing). In September 1996, the magistrate of the Federal District Court in St. Paul, MN, recommended a summary judgment against the plaintiffs to the judge of the civil antitrust suit. The magistrate concluded that the plaintiffs had failed to produce sufficient evidence of the alleged price fixing. The class action suit dated from the summer of 1993.

In 1996, potassium chloride prices declined slightly in the United States, while prices apparently stayed level around the world owing to reduced schedules and temporary mine closures. The U.S. spring weather was unusually wet in wheat and corn/soybean areas, occasionally reducing access to planting and fertilizer dispensing machinery, resulting in less fertilizer consumption for that period. Grain prices rose strongly while predictions of reduced worldwide grain stocks were headlined. Strong fall fertilizer application was due to good weather and expectations of next year's attempt at record crop production.

It is estimated that in 1997 domestic mine production will be 1.4 million tons and that the U.S. apparent consumption will be 6.0 million tons.

### **World Mine Production, Reserves, and Reserve Base:**

	Mine production		Reserves <sup>4</sup>	Reserve base <sup>4</sup>
	1995	1996 <sup>e</sup>		
United States	1,480	1,380	73,000	250,000
Azerbaijan <sup>e</sup>	50	50	NA	NA
Belarus	2,790	2,600	800,000	1,000,000
Brazil	223	270	50,000	600,000
Canada	9,010	8,400	4,400,000	9,700,000
Chile	50	60	10,000	50,000
China	80	80	320,000	320,000
France	802	760	10,000	30,000
Germany	3,280	3,200	730,000	870,000
Israel	1,330	1,300	44,000	<sup>5</sup> 590,000
Italy	—	—	20,000	40,000
Jordan	1,070	950	44,000	<sup>5</sup> 590,000
Russia	2,814	2,700	1,800,000	<sup>6</sup> 2,200,000
Spain	650	650	20,000	35,000
Thailand	—	—	30,000	100,000
Ukraine	55	50	25,000	30,000
United Kingdom	<u>582</u>	<u>570</u>	<u>23,000</u>	<u>30,000</u>
World total (may be rounded)	24,300	23,000	8,400,000	17,000,000

**World Resources:** Estimated domestic potash resources total about 6 billion tons. Most of this lies at depths between 6,000 and 10,000 feet in a 1,200-square-mile area of Montana and North Dakota as an extension of the Williston Basin deposits in Saskatchewan, Canada. The Paradox Basin in Utah contains approximately 2 billion tons, mostly at depths of more than 4,000 feet. An unknown, but apparently large, quantity of potash lies about 7,000 feet under central Michigan. The U.S. reserve figure includes a conservative estimate of 25 million tons of reserves in central Michigan. Estimated world resources total about 250 billion tons. The potash deposits in the former Soviet Union contain large amounts of carnallite; it is not clear if this can be mined in a free-market, competitive economy. Large resources, about 10 billion tons and mostly carnallite, occur in Thailand.

**Substitutes:** There are no substitutes for potassium as an essential plant nutrient and essential requirement for animals and humans. Manure and glauconite 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>Average prices based on actual sales; excludes soluble and chemical muriates.

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>3</sup>See Appendix B.

<sup>4</sup>See Appendix C for definitions.

<sup>5</sup>Total reserve base in the Dead Sea is equally divided between Israel and Jordan.

<sup>6</sup>A reserve of 22,300,000 tons was reported by I. D. Sokolov in Basic Tasks of the Potash Industry up to the Year 2000, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva Im. D. I. Mendeleeva, v. 32, No. 4, July-Aug. 1987, pp. 383-387.