

Potash

Michel Prud'homme

*The author is with the Minerals and Metals Sector, Natural Resources Canada.
Telephone: (613) 992-3733
E-mail: mprudhom@nrcan.gc.ca*

The term "potash" refers to a group of potassium-bearing minerals and chemicals. Potash includes potassium chloride (sylvite), potassium-magnesium chloride (carnallite), potassium sulphate, potassium-magnesium sulphate, and potassium nitrate. The dominant potash product is potassium chloride, or KCl, a naturally occurring pink salty mineral for which Canada is the leading world producer and exporter.

The main use of potash is in the agricultural sector where it is used as a plant nutrient for its potassium content, which is the third major nutrient after nitrogen and phosphate. Potash plays an important role in the regulation of plant physiological functions; it supports plant growth and primarily enhances the efficiency of plants in the uptake of other nutrients, boosting their nitrogen and phosphate absorption. Industrial potash is used in the manufacture of potassium-bearing chemicals, as an alternative to de-icing salt, and as a water conditioner. Other end uses include detergents, ceramics, chemicals and pharmaceuticals.

WORLD OVERVIEW

The world's potash supply/demand situation in 1997 was very positive; sales and imports rose in all key consuming regions of Asia and the Americas. A firmer marketplace resulted in a balanced supply condition, which tightened further in the second half of 1997 due to the unexpected permanent closure of Potacan Mining Company of Canada (Potacan) in Sussex, New Brunswick, due to flooding, and the announcement of the shut-down of the Eddy Potash mine in Carlsbad, New Mexico, due to reserves depletion. Global potash demand rose 10% to about 25 Mt K₂O, of which 94% was for fertilizer potash. Industrial potash consumption was estimated at 1.5 Mt K₂O. Total sales amounted to 26 Mt when the distri-

bution gap, losses and inventory movements are taken into account. World potash trade rose 20% to 20.6 Mt, reaching a record level and benefitting major exporting countries such as Canada and the C.I.S.

Asia

Potash consumption in Asia, which accounted for 25% of world potash consumption, rose by 18% triggered by strong demand in China and India, and sustained sales in Japan, the Republic of Korea (South Korea) and Indonesia.

In China, potash imports in 1997 registered a 35% increase over 1996 as a result of the combination of a growing demand for fertilizer potash in Chinese agriculture, a depletion in its carry-over inventory from 1995 to 1996, and its low level of potash imports in 1996. China's potash purchasing pattern shifted from sporadic contracts in 1996 to regular spot sales during most of 1997 despite early uncertainties regarding the application of a value-added tax and other import taxes and quotas. In mid-year, potash sales to farmers declined due to low grain prices, which resulted in a higher level of re-exports to other Southeast Asian countries, mostly to Indonesia, Vietnam and Bangladesh. Despite strong sales, the nitrogen-to-potash ratio remained deficient.

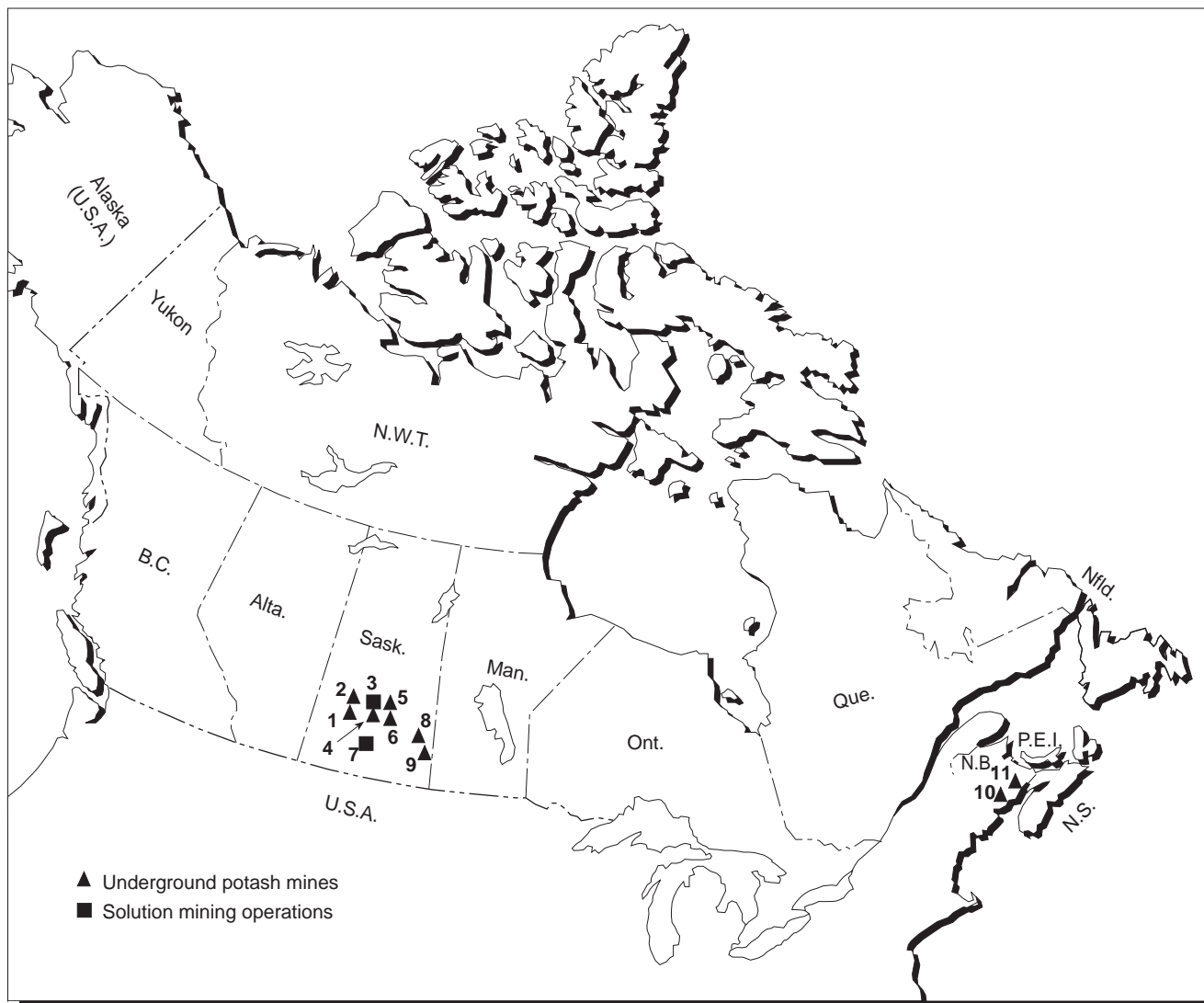
Potash sales in India rose significantly along with the increase in the government subsidy for potash, which rose 30% to 2000 rupees per tonne of KCl (US\$52/t). This measure provided the incentive for higher potash consumption to restore the nutrient balance and increase crop yields. Potash imports recovered from their low 1996 level to close to the same high level of 1995.

Europe and the C.I.S.

Potash use in Europe and the C.I.S., which together accounted for 30% of global demand, demonstrated marginal growth in 1997 driven mostly by a sustained recovery in the C.I.S.

In Western Europe, potash sales, accounting for 20% of world consumption, were flat at 5.4 Mt K₂O. The market for granular-grade potash became tight by mid-1997 due to shortfalls in supply.

Figure 1
Location of Potash Mines and Operations in Canada, 1997



Numbers refer to locations on map above.

UNDERGROUND POTASH MINES

1. Agrium Inc., Vanscoy, Saskatchewan
2. Potash Corporation of Saskatchewan Inc., Cory Division, Saskatoon, Saskatchewan
4. Potash Corporation of Saskatchewan Inc., Allan Division, Allan, Saskatchewan
5. IMC Central Canada Potash Inc., Colonsay, Saskatchewan (IMC Kalium)
6. Potash Corporation of Saskatchewan Inc., Lanigan Division, Lanigan, Saskatchewan
8. International Minerals & Chemical Corporation (Canada) Global Limited (K1 and K2 mines), Esterhazy, Saskatchewan
9. Potash Corporation of Saskatchewan Inc., Rocanville Division, Rocanville, Saskatchewan (IMC Kalium)
10. Potash Corporation of Saskatchewan Inc., Cassidy Lake Division, Clover Hill, New Brunswick (milling facilities only)
11. Potash Corporation of Saskatchewan Inc., New Brunswick Division, Sussex, New Brunswick

SOLUTION MINING OPERATIONS

3. Potash Corporation of Saskatchewan Inc., Patience Lake Division, Patience Lake, Saskatchewan
7. IMC Kalium Canada Limited, Belle-Plaine, Saskatchewan (IMC Kalium)

Potash sales to the C.I.S. and Central Europe, together accounting for 10% of world consumption, continued to register some recovery. In the C.I.S., the Russian and Belarus governments continued to provide financial support to farmers through decrees for subsidies to the agricultural sector, including specific provisions for fertilizer purchases. A major improvement in fertilizer potash consumption was registered in Uzbekistan, where a potash program was successfully implemented. In Central Europe, potash consumption increased modestly as national economies continued to improve, especially in Poland, Hungary and the Czech Republic.

The Americas

Potash sales in the Americas grew by 20% in 1997 due to higher crop prices, favourable economic conditions for farmers, and heavy shipments late in 1997 in anticipation of strong demand for the spring of 1998.

Potash sales in Latin America, amounting to 15% of world consumption, rose by 15% with Brazil accounting for three quarters of the potash consumed in the region. In 1997, potash imports into Brazil continued to increase as fertilizer stocks were low early in the year. Relatively high prices for exportable crops led to a sustained demand for potash despite the introduction of restrictive credit measures and import tariffs by the Brazilian government to reduce the deficit in the trade balance of payment.

Potash sales in the United States, accounting for 25% of world consumption, were robust in 1997 in response to favourable weather conditions, relatively high grain prices, and an increase in corn and soybean planted acreages. The increase in planted acreage reflected the effect of the new 1996 U.S. Farm Bill, which allows more planting flexibility for farmers. Potash sales in the U.S. market grew by 16% in 1997 to more than 6.7 Mt K₂O.

WORLD PRODUCTION

World potash production in 1997 was estimated at 25.4 Mt K₂O, a 10% increase compared to the previous year. Production increases were recorded in almost all major exporting countries with the exception of France and Jordan. Canada and the C.I.S. accounted for 90% of the increase, while small increases were reported in Brazil, Chile, Germany and the United States. Globally, potash producers operated at an overall capacity rate of 70% in 1997 compared to 65% in 1996. Canadian operations ran at 67% of capacity and those in the C.I.S. at 60%, while all other major world producers operated at levels above 80%, with the exception of France (58%).

In 1997, potash suppliers matched growing demand with tonnage from both production and inventory. Sales in 1997 were estimated at 26.1 Mt K₂O, result-

ing in a global decline in inventory of about 0.7 Mt. Major reductions in inventories were reported in Canada and Israel.

World capacity remained relatively static at 35.9 Mt/y; expansions and new capacity in Chile, Canada, the United States and Brazil offset closures and reductions in Germany, Spain and France. (The impact of the closure of the Eddy Potash operation will be reflected in 1998's capacity figures.) However, the major impact of the flooding of the Potacan mine in the fall of 1997 was a reduction in the world's potash production capability, which dropped by 3% from an estimate of 31 Mt/y to 30.2 Mt/y. The global surplus of capacity over production in 1997 was estimated at 11 Mt K₂O, of which Canada and the C.I.S. contributed 90%.

CANADIAN INDUSTRY

By year-end 1997, the potash industry in Canada was comprised of three companies that together employ more than 3400 workers. Production occurred at eight underground mines and two solution mining operations in Saskatchewan, and at one underground mine in New Brunswick. The Canadian potash industry was first developed in the early 1960s with the opening of potassium chloride mines in Saskatchewan. As the result of a series of expansions in the 1970s and 1980s, Canada now ranks as the world's largest producer and exporter of potash.

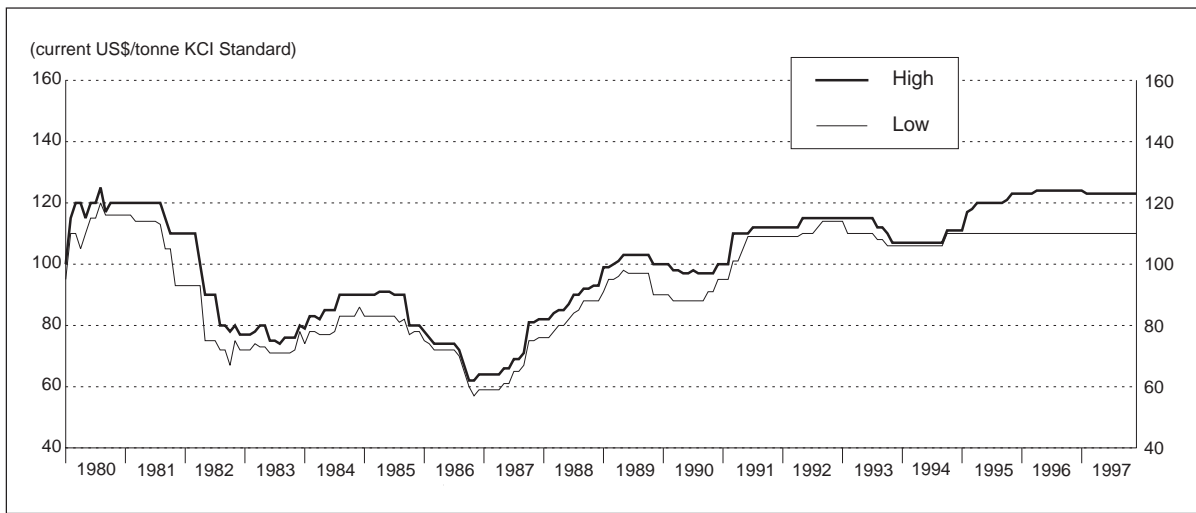
Major Developments

In 1997, Canadian potash production increased by 13% to 9.0 Mt K₂O, or 14.8 Mt KCl. Higher output from Saskatchewan more than offset lower production from New Brunswick. Canadian potash shipments rose by 16% to 9.3 Mt (15.3 Mt KCl) due to robust sales to offshore and domestic markets. In offshore markets, sales grew in most major potash importing countries, notably China and Brazil. Sales to China increased as local requirements were almost totally met by imports from both Canada and the C.I.S. High import levels in China continued to be sourced from the C.I.S.; however, close to 0.7 Mt KCl of C.I.S. imports were re-exported.

Canada's value of total potash sales (f.o.b. mines) was estimated at \$1.46 billion in 1997, compared to \$1.28 billion in 1996. In 1997, the average unit value of potash shipped by Canadian producers was \$96.26/t KCl (f.o.b. mines). Potash exports totalled 14.6 Mt KCl valued at about \$1.8 billion. Canadian inventories decreased by 0.5 Mt to 1.8 Mt KCl.

The major event in the Canadian potash industry during 1997 was the unexpected closure of the Potacan Mining Company (Potacan) operation in Sussex, New Brunswick. The 0.8-Mt/y K₂O underground mine experienced water inflows in June 1997; despite efforts to salvage the operations during the

Figure 2
Canada, Offshore Potash Price Quotations, 1980-97^e
 f.o.b. Vancouver Contract



Source: Compiled by Natural Resources Canada from trade magazines and specialized subscriptions.

^e Estimated.

summer, the mine was flooded in the fall of 1997. This event had an important effect on Canada's potash production. In early 1997, Canada's annual potash capacity was estimated at 13.4 Mt, of which about 1.5 Mt K₂O consisted of idle milling units at the Cory, Lanigan and Patience Lake operations in Saskatchewan. New Brunswick accounted for slightly less than 1.3 Mt K₂O, or 10% of Canada's total capacity. Considering that capacity estimates have been based on milling, the event at Potacan would not, in effect, modify the overall estimate for Canada's capacity of 13.4 Mt/y; however, it does affect Canada's potash capability and production. In early 1997, the immediate capability to produce potash was estimated at about 11.3 Mt K₂O, or 18.5 Mt KCl; by the end of the year, this capability had been reduced by 7% to 10.5 Mt K₂O (17.2 Mt KCl).

During 1997, investigations continued into allegations of price-fixing in North America by several U.S. and Canadian potash producers. In January 1997, a U.S. District Judge in Minnesota dismissed a class-action lawsuit following the recommendation of a Magistrate Judge in September 1996 for dismissal by summary judgement due to a lack of evidence. The plaintiffs have filed an appeal.

Saskatchewan

Saskatchewan produced about 92% of Canada's potash in 1997. During the year, several temporary shut-downs were carried out by mine operators in the province for inventory control and, to a lesser extent, for maintenance and vacation.

In early 1998, the Province of Saskatchewan announced a series of measures in its tax regime for potash: the elimination of the top profit tax bracket of 50% (leaving 35% as the top rate); an expansion of the 15% profit tax bracket by 2001; the freezing of the base payment rate at the 1997 level; and a 35% depreciation rate applicable to all capital investment.

Potash Corporation of Saskatchewan Inc. (PCS Inc.) is the largest publicly held potash producer in the world. In 1997, PCS Inc. operated five mines in Saskatchewan and one in New Brunswick. PCS Inc. also owns reserves at Esterhazy that are mined by International Minerals & Chemical Corporation (Canada) Global Limited (IMC Kalium) under a long-term agreement that entitles PCS Inc. to 25% of production. All PCS Inc. mines, except the Patience Lake solution mine, use conventional underground mining techniques. In 1997, potash production from all of PCS Inc.'s operations, including tonnage from the New Brunswick Division and from PCS Inc.'s account at Esterhazy, was estimated at 6.4 Mt KCl, a 12% increase compared to 1996. PCS Inc.'s operating rate rose to 53% in 1997, compared to 47% in 1996. Throughout 1997, PCS Inc. continued to pursue its policy of strict inventory control with intermittent shut-downs at all of its operations. PCS Inc.'s production capacity is estimated at 7.4 Mt/y K₂O, equating to 56% of Canada's total potash capacity.

During 1997, PCS Inc. extended for another year its offshore marketing agreements with three U.S. potash producers in New Mexico. In July 1997, PCS Inc. and BASF AG of Germany terminated their US\$148 million agreement to purchase BASF's 51% interest in the German publicly traded company Kali

und Salz Beteiligungs AG (K&S AG). The main holding of K&S AG included a 51% interest in Kali und Salz GmbH and a 50% interest in Potacan. Early in July, the deal was blocked by the German Minister of Economics following a similar recommendation rendered by the German Cartel Office in February 1997. In March 1998, PCS Inc. completed the purchase of Potacan's assets in Sussex, New Brunswick, from its European owners. According to PCS Inc., the Potacan processing mill will be used to process standard-grade products from Saskatchewan into granular products. PCS Inc. may also investigate the possibility of expanding its mining operation at its New Brunswick Division in Sussex. The Potacan potash operation now operates under the name of PCS Cassidy Lake Division.

IMC Kalium, a division of IMC Global Inc., manages four potash operations in Canada: the two interconnected underground mines, K1 and K2, at Esterhazy in southeastern Saskatchewan; one large potash solution mine at Belle-Plaine, west of Regina; and a conventional underground mine located at Viscount/Colonsay in the Saskatoon area. Altogether, IMC Kalium's Canadian potash capacity is close to 4 Mt/y K_2O , or 30% of Canada's total potash capacity. In 1997, IMC Kalium's production increased by 20% to 6.4 Mt KCl, and its overall operating rate was 98% compared to 83% in 1996. During the year, IMC Kalium continued to manage its recurring water inflows at the K2 mine where inflow rates have been steadily creeping up over the last three years. In 1997, the company initiated an important structural consolidation program at the Esterhazy mines using a sand-concrete backfill system to support the underground area; when completed, this program is expected to reduce the rate of water inflows by more than half. In early 1998, IMC Kalium announced a major \$200 million investment plan to expand capacity between 1998 and 2001; its capacity is projected to increase by 0.7 Mt KCl at Belle-Plaine, and by 0.5 Mt KCl at Colonsay. IMC Kalium will also invest another \$200 million at its Saskatchewan potash operations for capital improvement and modernization work.

Agrium Inc. produced 1.5 Mt KCl at its Vanscoy mine in 1997; the 60% increase came from the resumption of production at normal levels compared to 1996 when a labour dispute affected the operation for more than three months. For the entire year, the potash operation ran at 80% of capacity, compared to 55% in 1996. During 1997, Agrium completed a \$32 million expansion to increase the production of coarse and granular grades of potash. In mid-year, Agrium announced the construction of a new phosphate mine at Kapuskasing in northern Ontario, and also acquired a phosphate mine in Idaho from Rhone-Poulenc Basic Chemical Co.

Big Quill Resources Inc. manufactured potassium sulphate from sodium sulphate brine at Big Quill Lake and from purchased potassium chloride. The company, located in Wynyard, has a production capa-

city of 30 000 t/y of secondary potassium sulphate (K_2SO_4). In 1997, the company pursued another expansion project to increase its total capacity to 50 000 t/y by 1998. Potassium sulphate products are used in the fertilizer, chemical and wallboard sectors.

Potassium Sulphate Company (PSC) commissioned a new 25 000-t/y secondary potassium sulphate plant at Alsask. The plant was acquired from Agassiz Resources, which previously produced sodium sulphate for the pulp and paper market. PSC is 58% owned by Sotec Products Ltd. of Cabri, Saskatchewan.

In 1997, Canpotex Limited completed the construction of a new US\$50 million potash terminal at Portland, Oregon. The project, a joint venture with Hall-Buck Marine, Inc., will have an ultimate handling capacity of 5 Mt/y of potash products. The Portland bulk terminal was fully operational by the third quarter of 1997. Late in 1997, Canpotex Limited of Saskatoon and International Potash Company of Moscow formed a new marketing joint venture, Bulk Logistics Private Limited, to sell potash to Malaysia.

New Brunswick

In New Brunswick, potash was mined at two underground operations located in the Sussex area of Kings County. The potash products for export are hauled 60-80 km from the Sussex area to the Barrack Point potash terminal in Saint John. The terminal, which is operated by Furncan Marine, has a storage capacity of 165 000 t of potash. The shipping port, equipped with a 2700-t/h shiploading facility, can accommodate cargo sizes between 3000 and 50 000 t.

Potacan Mining Company's (PMC) underground mine suffered massive inflows in mid-year. Following unsuccessful attempts to salvage the integrity of the operation through a series of corrective measures, including grouting with a cement-bitumen mixture, the mine was flooded in the fall. The company had been extracting potash at the Cloverhill mine located 20 km southeast of Sussex since 1985. PMC was previously owned by Potash Company of Canada Limited, which in turn was owned jointly by Entreprise minière et chimique (EMC) of France and Kali und Salz AG of Germany.

The New Brunswick Division of PCS Inc. operated the Penobsquis underground mine about 5 km east of Sussex. Its production in 1997 rose marginally to 715 000 t KCl. The mine operated throughout the year at high capacity utilization. Mining is carried out by cut-and-fill methods, along with the use of a room-and-pillar layout. Salt tailings, slimes and excess brine are stored underground as part of an integrated closed-loop mining system. Between June and July, the operation was shut down for six weeks due to a failure of the motor hoist for the production shaft.

In 1997, IMC Global concluded its exploration work at the Millstream potash deposit near Sussex. The company had signed an agreement in 1996 with the Province of New Brunswick to carry out seismic surveys, a feasibility study and a geological reassessment to evaluate the potential mining of this deposit.

Manitoba

During 1997, the Government of Manitoba pursued its promotional activities for selling to private companies its 49% interest in the Manitoba Potash Corporation, a joint venture with EMC of France. The joint venture holds the rights to a sylvinite deposit in the Russell-Binscarth area adjacent to the Manitoba-Saskatchewan border. Proven mineable ore reserves were estimated at 120 Mt of potash grading 24.5% K₂O. Initial development plans in the 1980s called for a 2-Mt/y potassium chloride mine.

CANADIAN POTASH TRADE

Canada is the world's largest potash exporter with a 44% share of international trade. The C.I.S. is the second largest exporter, followed by Germany. Canada exports potash to more than 35 countries, although only 6 countries account for close to 80% of Canada's total potash exports. In 1997, Canadian potash was shipped mostly to the United States (60%) and Asia (25%), with the remainder being sent to Latin America (10%), Oceania (3%) and Europe (2%).

In 1997, data compiled by Statistics Canada indicated that Canadian potash exports were valued at \$1.75 billion with tonnage totalling 14.6 Mt KCl (or 8.9 Mt K₂O), an 11% increase compared to the previous year. The United States remained the dominant destination with exports at 8.6 Mt KCl, of which 90% was for agriculture. Offshore sales increased by 15% to 6.0 Mt KCl.

Canadian potash exports to almost every region increased in 1997, with the notable exception of Western Europe. Exports to Asia rose by 20% due to a marked increase in shipments to China, which accounted for 30% of all offshore potash exports from Canada. Shipments to Japan, Taiwan, Thailand and Vietnam remained strong, while some lower sales were reported in Indonesia and the Philippines. Shipments to Latin America continued to grow, increasing by 8% in 1997. Brazil, which accounted for 77% of Canadian sales in this region, registered a major increase, along with Chile, Venezuela and Costa Rica, which offset declines in Cuba and Colombia. Sales to Europe dropped by 36% due to significantly lower shipments to France and the United Kingdom.

INTERNATIONAL DEVELOPMENTS

In 1997, world production of potash registered an important increase as demand expanded in most consuming regions, while some shut-downs of capacity resulted in a tight supply condition. World production rose by almost 10% to about 25.4 Mt K₂O. Most of the 2-Mt increase occurred in the C.I.S. (60%) and Canada (40%). North America was the major producing region with a 40% share of world potash output; Canada contributed 35% to world production in 1997, followed by the C.I.S. (25% share), Western Europe (20%) and the Middle East (10%).

The Americas

In Argentina, Potasio Rio Colorado S.A., a subsidiary of Minera Tea S.A. of Buenos Aires, announced plans for a new potash project at its sylvinite deposit in the northern Mendoza Province. During 1997, the company was seeking partners to develop a \$150 million solution mining project with a projected capacity of 750 000 t/y of potassium chloride. Late in 1996, a high-resolution seismic program confirmed proven reserves of 52 Mt of potassium chloride.

In Brazil, potash production by Companhia Vale do Rio Doce (CVRD) increased by 7% over 1996. In 1997, CVRD completed an expansion program, raising its annual capacity to 700 000 t of potassium chloride. During the year, the Brazilian government finalized the partial privatization of CVRD and sold 75% of its holdings in the company, which include the Vassouras potash mine, to Companhia Siderurgica Nacional in a US\$1.9 billion transaction. The remaining shares are expected to be divested in 1998.

In Chile, potash production doubled in 1997 following the completion in 1995 of a new solar potash operation with a capacity of 300 000 t/y of potassium chloride in northern Chile. Sociedad Quimica y Minera de Chile S.A. (SQM) completed the first phase of the Minsal project at Salar de Atacama for producing potash as feedstock for its potassium nitrate plants. A second phase, which includes a new 250 000-t/y potassium sulphate plant, is expected to come on stream in 1998. SQM is also contemplating a series of expansions to double its current potassium chloride capacity by 1999. In 1997, Minera Yolanda S.A., a subsidiary of Kap Resources Ltd. of Vancouver, continued the construction of a new 250 000-t/y potassium nitrate facility at Yumbes in northern Chile; its potash feedstock will be supplied by Canpotex. Atacama Minerals Corporation, a subsidiary of Boron Chemicals International Ltd. of Vancouver, announced plans to build a US\$50 million chemical complex to recover iodine and sodium sulphate at Aguas Blancas in northern Chile; over the longer term, a 70 000-t/y potassium nitrate facility is planned.

In the United States, potash production rose by 3% in 1997. Potassium sulphate and potassium-magnesium sulphate together accounted for one quarter of U.S. potash production, with the remainder being potassium chloride. In 1997, the U.S. potash industry ran at 83% of capacity, the same level as in 1996. During the year, Mississippi Chemical Corporation announced the permanent closure of its 300 000-t/y potassium chloride Eddy Potash mine in Carlsbad, New Mexico, at the end of 1997 due to ore depletion. IMC Kalium concluded the US\$53 million acquisition of Western Ag-Minerals, which has been operating a 400 000-t/y potassium-magnesium sulphate operation in Carlsbad. IMC Kalium also completed a US\$60 million expansion program at its potash solution mine in Hersey, Michigan; the expansion tripled the mine's current capacity to 150 000 t/y of potassium chloride. Late in 1997, IMC Global signed a letter of intent to buy the assets of Harris Chemical Group Inc. (HCG) for US\$450 million and to assume close to US\$950 million in debt. The assets of HCG include the potash operation of Great Salt Lake Minerals Corporation at Ogden, Utah, where capacity is being expanded to reach 500 000 t/y of potassium sulphate by 1998. In early 1997, North American Chemical Co. closed its potassium chloride and potassium sulphate operation at Trona, California.

C.I.S.

Potash production in the C.I.S. in 1997 rose by 25% to 6.7 Mt K₂O. The operating rate in the C.I.S. was close to 60% of capacity, compared with 48% in 1996. Russia's potash production rose 30% with an overall operating rate of 54%; its potash was produced by Uralkali Ltd. and Silvinit Ltd. Higher potash extraction was registered at Uralkali's facilities due to the reactivation of the Uralkali 4 plant for potash production. In Belarus, potash production increased 17%, and PO Belaruskali operated at 60% of capacity. Total C.I.S. potash deliveries rose 30% in 1997 due to strong offshore exports and a sustained recovery in the domestic market. Domestic deliveries increased by 15% to reach 1.4 Mt K₂O in 1997 in response to market development activities in Uzbekistan and dedicated government support in both Russia and Belarus. Transportation and energy costs stabilized in 1997 after registering some increases in 1996.

Total C.I.S. exports increased by almost 40% to 5.1 Mt K₂O in 1997. The level of exports rose in most regions, although the level of C.I.S. potash re-exports from China to other Southeast Asian countries continued to grow. Major export destinations were China (0.9 Mt K₂O), followed by Brazil (0.7 Mt), Central Europe (0.7 Mt), India (0.6 Mt), and the United States (0.3 Mt). Exports were shipped mostly from the Port of Ventspils (Latvia), and partly from the Russian Port of St. Petersburg, the Ukrainian ports of Ilyichevsk and Nikolaev on the Black Sea, and the Port of Klaipeda (Lithuania). Several terminal facilities are being expanded at numerous ports

within the C.I.S. and in the Baltics (Klaipeda, Ventspils, Murmansk, Ust Luga, and St. Petersburg). These projects will offer additional opportunities for the C.I.S. to expand its offshore exports and improve its potash transportation logistics in the short to medium term. In recent years, C.I.S. exporters have proven their capability to meet growing offshore demand despite reports of logistical constraints.

Europe

The Commission of the European Union completed its three-year administrative review of existing anti-dumping measures against C.I.S. potash-producing countries. In early 1998, the Commission proposed a 7% decrease on the minimum import prices while maintaining fixed duties for each producing country.

In France, potash production continued to decrease for the fifth consecutive year as the result of the phase-out of potash mining in Alsace. Its 1997 production declined by 10% over 1996. According to the Société Commerciale des Potasses et de l'Azote, the two remaining French mines are forecast to close between 2002 and 2004, and production is expected to decline gradually.

In Germany, potash production rose marginally. Overall German potash capacity in 1997 was estimated at 3.7 Mt K₂O following the closure of the Niedersachsen potash mine; 75% of this capacity is dedicated to potassium chloride. In July 1997, the Ministry of Economics cancelled the tentative sale to PCS Inc. of 25% of BASF AG's assets in K&S AG. By year-end, BASF had sold 25.5% of its shares in K&S AG to private investors; as a result, BASF has reduced its shareholding to just under 50% and has also indicated that it plans to divest another 25% share in the near future.

In Spain, potash production declined by 3%. In mid-1997, Potasas de Subiza's 300 000-t/y potassium chloride operation in Pamplona (Navarra) closed due to reserves depletion. Overall Spanish potash capacity was estimated at 1.2 Mt/y KCl at the end of 1997. Potash is extracted from two mines at Llobregat and Suria in Catalonia. During the year, the Spanish government undertook a plan to privatize the potash mining group, Grupo Potasas, which comprises Potasas de Llobregat, Suria K, Commercial de Potasas, Société Générale des Sels et Potasses, and Trafico de Mercancias. Several potash and non-potash corporations expressed an interest in those assets. Conclusion of the privatization is expected by mid-1998.

In the United Kingdom, Cleveland Potash Ltd.'s (CPL) production declined by 10% over 1996. During 1997, CPL obtained planning permission to extend its underground mining area at Boulby in northeastern England in order to expand its existing mineable reserves.

Middle East

In Israel, Dead Sea Works Ltd.'s (DSW) production was maintained at 1.5 Mt K₂O in 1997. The company continued to remove salt pillars from the solar evaporation ponds for improving its overall carnallite recovery. DSW pursued a US\$50 million expansion plan to increase its capacity by 15% to reach 2.8 Mt/y of potassium chloride by 2000. Haifa Chemicals Ltd. announced plans to invest US\$45 million for a 100 000-t/y potassium nitrate expansion at its Mishor Rotem facility by 1999.

In Jordan, potash production by the Arab Potash Co. Ltd. (APC) dropped by almost 25% in 1997 due to a shortfall in brine feedstock and the presence of salt concretions in the solar salt ponds. APC continued to work on a \$45 million project to expand its potash facilities at Safi by 20% to reach 2.2 Mt/y of potassium chloride in 2000. The company also announced plans for a new 75 000-t/y secondary potassium sulphate plant at Aqaba before the end of 1999. In 1998, the Government of Jordan is expected to begin selling the majority of its shares (55%) in APC.

In Egypt, the Société Financière et Industrielle d'Égypte (SFIE) was reported to have initiated a feasibility study for the construction of a 70 000-t/y potassium sulphate plant at an estimated cost of US\$120 million.

In Ethiopia, Norsk Hydro ASA of Norway concluded a three-year potash exploration agreement with the Ethiopian Ministry of Mines to explore the Danakil potash deposit in the region of Dallol. The sylvinitic deposit was previously investigated in the early 1970s when reserves were estimated at 150 Mt grading 20% K₂O.

Asia

In China, potash production from carnallitic brines at Qinghai was estimated at 100 000 t K₂O. Late in 1997, there were reports of progress in the development of the US\$550 million Chinese-Israeli project for a potash solar operation at Qarhan Salt Lake in the northwestern Qinghai Province, which has been promoted for the past seven years. The joint venture calls for potash extraction from subsurface carnallitic brines with an ultimate capacity of 800 000-t/y of potassium chloride. In 1996, the project received government support after its inclusion in the Chinese Ninth Five-Year Economic Plan, which included strong commitments to agriculture and domestic fertilizer production. Given previous potash developments in the Qinghai area, completion of this project, if construction were to begin in 1998, would take at least three years; potash recovery would therefore only occur by 2002. The facility is expected to use DSW's cold crystallization technology to extract potash from shallow carnallite brines. Partners in the project include the United Development Industry

Co. of Israel, Mingda Corporation, and the Qinghai Salt Lake Industrial Group of China.

Also in China, a new joint venture led by Spur Ventures Inc. of Vancouver is promoting the expansion of existing potash capacity near Golmund in Qinghai Province. In the short term, capacity would increase to 100 000 t/y of potassium chloride. Spur Ventures is also evaluating the feasibility for a 120 000-t/y potassium sulphate project at Tiajinaier Lake in Qinghai for production in the early 2000s.

In northeastern Thailand, the ASEAN Potash Mining Co. (APMC) continued its construction work to develop a salt-potash mine at Bamnet Narong. The US\$500 million project calls for an underground carnallite mine with a capacity of about 1 Mt/y of potassium chloride. Late in 1996, APMC contracted work for the construction of a decline drift into salt formations above the carnallite orebody. Completion of the extension of the 950-m-long decline at the 180-m level was expected by the end of 1997. Construction of a second decline is projected to start in 1998. APMC plans to produce 0.5 Mt/y of salt and to start potash mining by 2001/02.

Also in northern Thailand, Asia Pacific Potash Corporation (APPC) completed a bankable feasibility study in December 1997 for the development of a sylvinitic potash deposit in the Sakon Nakhon Basin close to the Laos border. The company has been investigating two orebodies: the Somboon and Udon fields. The development of a new 2-Mt/y potassium chloride mine is currently centred around Somboon where sylvinitic mineable reserves have been estimated at 118 Mt grading 23% K₂O at a depth of 300 m. Upon securing adequate financing, APPC expects construction to start in 1998. Mining plans call for two declines, a surface tailing system for the first six years of production, and deep-well injection for excess brine. APPC forecasts production of salt (0.2 Mt/y) and potash (2 Mt/y) to start by 2001/02. The total cost of the project, which is expected to employ 1400 workers, has been estimated at US\$550 million.

PRICES

The price of potash quoted on a free on board (f.o.b.) Vancouver basis (in U.S. dollars) is considered to be the pricing indicator for most Canadian international offshore sales. In many markets, prices are also quoted on a delivered basis, CFR (cost and freight) and c.i.f. (cost, insurance and freight) foreign ports. Canpotex Limited, representing all Saskatchewan potash producers, sells both f.o.b. Vancouver or c.i.f. foreign ports, or out of warehouses in Asia.

Offshore potash price quotations remained fairly static in 1997 despite a slight decrease reported late in 1996. Entering 1997, f.o.b. Vancouver potash prices were quoted averaging US\$117/t KCl for standard

grade. During the first half of the year, sales to China were strong on the spot market but resulted in no pricing movement due to intense competition between suppliers. In Latin America, prices in Brazil recovered and showed upward indications as demand expanded and credit support became more available. By the end of the year, price quotations were relatively steady at US\$116.50/t. With favourable market perspectives for 1998, price quotations were moving upward late in 1997, prompting Chinese buyers to enter into a major contract agreement with Canpotex for the delivery of 0.7 Mt of potassium chloride between December 1997 and February 1998. In other offshore business, C.I.S. potash prices were quoted at US\$78-\$82/t for standard potash f.o.b. Baltic ports in January 1997, and remained at that level for the entire first half of 1997. This low pricing level and the consequent low delivered price to China resulted in an increase in C.I.S. potash re-exports. By the third quarter of 1997, C.I.S. pricing quotations registered some movement to US\$78-\$84/t, indicating the possibility of an upward pricing readjustment in early 1998.

In North America, quotations f.o.b. Midwest on coarse-grade potash started at US\$100-\$106/short ton (st) in January 1997. Favourable weather conditions and an increase in crop acreages raised fertilizer demand and led to higher prices during the planting season. By April, price quotations were at US\$105-\$112/st. In the third quarter of 1997, potash demand in the United States resumed as grain stocks continued to be depressed and supply became tighter due to Potacan's shut-down; potash prices recovered to US\$108-\$116/st after a seasonal downward correction in the summer. By the end of the year, quotations reached US\$114-\$118/st due to anticipated strong potash demand during the next U.S. spring season. On average, Midwest price quotations were much firmer in 1997 compared to 1996 and rose 13% by an aggregate US\$13/st. The gap between low and high quotations tended to diminish by year-end, signalling further increases in the first quarter of 1998.

OUTLOOK

Potash demand is projected to remain strong in 1998 with fundamental agricultural factors supporting a sustained demand for fertilizers to achieve higher grain production and stabilize grain inventory at a higher level than the prevailing 16% stock-to-use ratio. The major uncertainties facing the fertilizer and potash industry in 1998 are the current El Niño weather phenomenon and the currency crisis that has been affecting several countries in Southeast Asia since mid-1997.

The El Niño phenomenon will likely affect weather patterns in the Pan-Pacific Rim, generating warmer-than-usual temperatures eastward from the southern part of the Pacific Ocean, and could result in droughts in Asia and Oceania and abnormal flooding

in Mexico and on the U.S. West Coast. El Niño has the potential to disrupt crop planting and harvesting, and could also affect grain output in the United States during 1998. In the following years, a lower-than-anticipated grain production might bring higher demand for fertilizers.

The currency crisis in Asia is mostly affecting Southeast Asian countries such as Thailand, the Republic of Korea, Indonesia and Malaysia, and to a lesser extent China, Taiwan and Japan. As currency devaluation reduces economic access to fertilizer imports in these countries, potash sales are expected to be lower than in 1997; however, these countries represent a relatively low share of Asia's entire potash demand. Large contracted imports and higher prices for potash sales in Japan and China in late 1997 and early 1998 reflect a relatively strong global market entering 1998.

Global potash sales will remain relatively stable in 1998 with a possible contraction in trade from the record level of 1997 due to strong deliveries at the end of 1997 to major importing countries (the United States and China) and an expected reduction in imports in Southeast Asia.

Potash application in the United States is projected to increase by 2-3% in 1998 as the result of a combination of larger acreage for corn and soybean, along with the replenishment of nutrients in soybean-dedicated soils. Sales to the United States were strong late in 1997 in anticipation of a firm demand for fertilizers and higher prices for granular-grade potash. Sales to Brazil are projected to be stable as credit and import duty measures are fully absorbed and because cash crop prices are expected to remain relatively high; however, currency pressures may affect import levels. In the long term, there are opportunities to increase potash consumption in Brazil by improving the potassium application rate in mainstay crops such as corn, which has been receiving a limited fertilizer uptake compared to the recommended level, and also by expanding the surface area of arable land.

Potash demand in India is expected to remain strong in 1998 with the continuation of the potash subsidy at the 2000 rupees/t level. In the medium to long term, the shift to a higher protein diet in India, as is occurring in other parts of Asia, will trigger an increase in demand for fertilizers; as well, an upward readjustment in the nitrogen-to-potash ratio (from 1:0.12 to 1:0.18) offers the potential for additional demand of more than 0.5 Mt K₂O. In China, the potential for higher potash consumption persists. China's reported potash consumption of 2.4 Mt K₂O in 1997 is underestimated because important volumes of complex fertilizer imports that include potassium are not taken into account; however, on a relative basis, the imbalance in the reported nitrogen-to-potash ratio (at 1:0.10) remains large and below the optimum target (1:0.20). Chinese potash con-

sumption would need to double to meet its optimal agronomic nitrogen-to-potash ratio, leading to a potential for imports at close to 5.5 Mt/y K_2O by 2005. A recent survey of China's arable land surface could be perceived as another positive factor for additional potash demand; the survey indicated that China's landmass has been underestimated by 40%. The upward revision of arable land surface in China would suggest that the fertilizer and potash application rates per hectare are much lower than reported.

In Western Europe, potash demand is projected to be relatively stable in the medium to long term, depending on the outcome of the upcoming reforms to the Common Agricultural Policy and changes in agricultural practices. Potash sales in Central Europe and the C.I.S. are expected to continue to recover as agricultural and economic reforms are implemented, while potash demand has the potential to increase by 50% from its current low level.

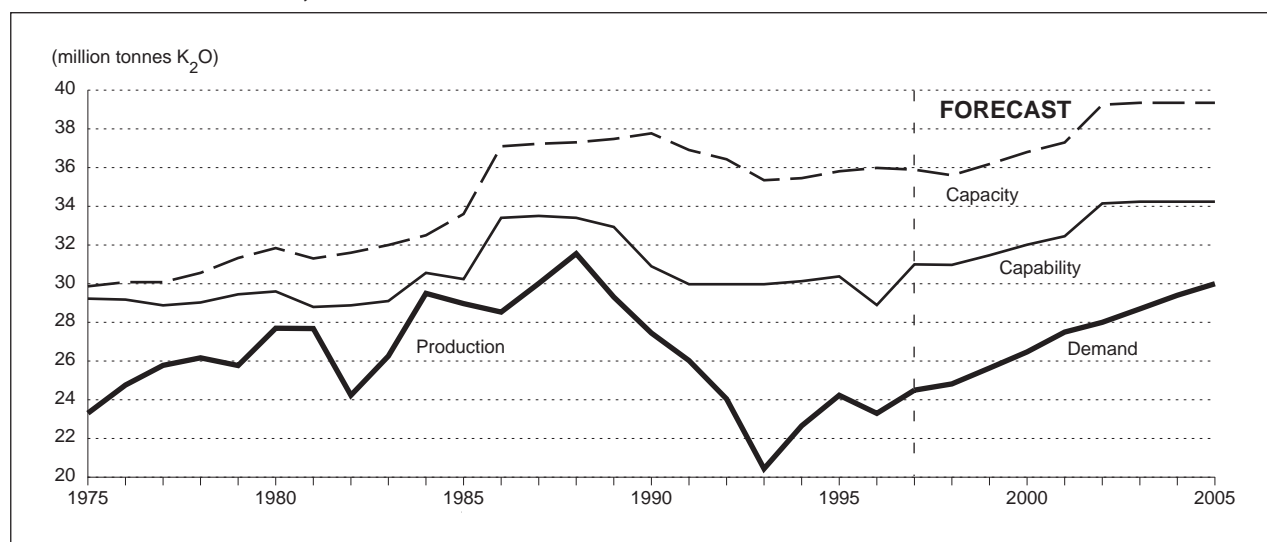
Total world demand for potash in 1998 is projected at 25.3 Mt K_2O , including 22.5 Mt K_2O for fertilizer potash (a 2.2% increase over 1997), 1.6 Mt K_2O for industrial uses, and around 1.0 Mt K_2O as a distribution gap. Most of the increase in demand during 1998 will be registered in the United States, Brazil, China and India, while potash fertilizer consumption is expected to continue to recover in Central Europe and the C.I.S. Marginal growth is projected in Western Europe and Latin America.

In the long term, world potash demand is expected to continue to expand. Fertilizer potash demand for the period 1997-2005 is forecast to grow by an overall 16%, or at an annual rate of 2% to reach 27 Mt/y by 2005. Most of the 5-Mt/y increase over the next eight

years will be registered in Asia (60%), followed by the Americas (20%), and the C.I.S. and Central Europe (20%). World demand for industrial potash is projected at 2 Mt/y K_2O by 2005. Taking into account growing industrial uses and fertilizer consumption, as well as the distribution gap, total world demand for potash is forecast at close to 30 Mt/y by 2005, compared to 25 Mt in 1997.

On the supply side, current potash capacity will be more than sufficient to meet world demand for the rest of the decade. Over the past few years, the prospects of growing demand and positive price movements have continued to generate interest in additional potash production and have resulted in the planning of several new projects. Established producers have been fairly active in increasing capacity over the past few years; newly announced expansions by several existing producers in Canada, the United States, Chile, Brazil, Israel and Jordan are now projected to offset the anticipated decline from mine closures in France. In a recent reversal of trend, world potash capacity from existing producers is forecast to be maintained at around 36 Mt/y K_2O by 2005. However, the marketplace continues to attract greenfield projects that are being scheduled to come on stream after the year 2000. Between 2000 and 2005, there are several projects for commissioning new mines in potash-consuming countries (Thailand, China, Argentina), while the prospect for a new mine in Canada remains probable only after 2005. Altogether (but excluding Canada), these projects have the possibility of adding close to 2.5 Mt/y of new capacity between 2000 and 2005. It is important to consider that many of these greenfield projects are being developed concurrently in potash-consuming countries, and would also be competing with estab-

Figure 3
World Potash Balance, 1975-2005



Source: Natural Resources Canada.

lished potash-trading countries. The future of the fine balance that is prevailing today will depend on an optimal commissioning time and a realistic market strategy for these new projects as the world surplus gradually declines.

The global potash capacity has the potential to increase by an overall 8% from 36 Mt in 1997 to 39 Mt/y in 2005. Between 1997 and 2005, the world's potash supply/demand balance is forecast to face a persisting but declining surplus. Based on capacity projections and demand forecasts, this surplus is expected to decline very gradually from 11 Mt K₂O in 1997 to 9 Mt/y by 2005, and will continue to be held by Canada and the C.I.S.

A better measure of world potash balance is obtained with the concept of capability (which refers to achievable marketable production capacity when considering technical and logistical constraints). Current world production capability is estimated by Natural Resources Canada at 30.2 Mt K₂O for a marketable surplus over demand of about 5 Mt K₂O. By 2005, the world's potash capability, including some new projects, is projected at around 34 Mt/y with a marketable surplus of 4 Mt/y K₂O. The surplus-to-demand ratio will be maintained at close to the 15% level, indicating an adequate level of supply in the long term to meet growing demand and to absorb possible annual variations in trade levels. However, if all announced projects were to be commissioned before 2005, the global capacity would have the potential to exceed 40 Mt/y K₂O with capability estimated at 36 Mt/y; the consequent surplus would be close to 6 Mt, equating to a 20% ratio and resulting in sustained oversupply conditions by 2005 and beyond.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 65. (2) Information in this review was current as of March 20, 1998.

TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
3104.20	Potassium chloride	Free	Free	Free	Free
3104.30	Potassium sulphate	Free	Free	Free	Free
3104.90.00.10	Magnesium-potassium sulphate	Free	Free	Free	Free
3104.90.00.90	Other	Free	Free	Free	Free

Sources: Customs Tariff, effective January 1998, Revenue Canada; Harmonized Tariff Schedule of the United States, 1998.

TABLE 1. CANADA, POTASH PRODUCTION, SHIPMENTS AND TRADE, 1996 AND 1997

Item No.	1996		1997P		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
PRODUCTION, Potassium Chloride					
Gross weight	13 076 975r	..	14 785 865	..	
K ₂ O equivalent	7 992 034r	..	9 036 461	..	
SHIPMENTS					
K ₂ O equivalent	8 120 389r	1 277 860r	9 301 020	1 465 585	
IMPORTS, Fertilizer Potash					
3104.20	Potassium chloride, in packages weighing more than 10 kg				
	United States	12 006	1 793	4 421	586
	France	265	34	231	31
	Belgium	-	-	124	18
	United Kingdom	39	5	44	5
	Germany	8	1	29	3
	Switzerland	-	-	2	1
	Japan	-	-
	Total	12 318	1 833	4 851	644
3104.30	Potassium sulphate, in packages weighing more than 10 kg				
	United States	9 316	2 918	5 843	1 886
	Germany	14	34	10	22
	United Kingdom	1	3	2	3
	Othe countries	20	14	-	1
	Total	9 351	2 969	5 855	1 912
3104.90.00.10	Magnesium-potassium sulphate				
	United States	64 165	13 020	69 877	16 182
	Total	64 165	13 020	69 877	16 182
3104.90.00.90	Other potassic fertilizer				
	United States	2 289	944	5 502	1 896
	Chile	-	-	80	46
	China	-	-	86	36
	Other countries	2	1	43	28
	Total	2 291	945	5 711	2 006
Potash Chemicals					
2815.20	Potassium hydroxide (caustic potash)	16 091	9 204	18 271	10 876
2834.21	Potassium nitrate	6 185	3 708	6 009	3 420
2835.24	Potassium phosphates	1 179	1 239	1 260	1 346
2836.40	Potassium carbonates	2 460	1 705	2 209	1 513
2839.20	Potassium silicates	1 039	542	1 206	600
	Total potash chemicals	26 954	16 398	28 955	17 755
EXPORTS, Fertilizer Potash¹					
3104.20	Potassium chloride, in packages weighing more than 10 kg				
	United States	7 657 484r	800 589r	8 552 795	893 330
	China	1 131 101	164 819	1 773 854	258 485
	Brazil	1 087 510	141 324	1 168 255	152 341
	Japan	503 601	76 426	569 383	84 296
	Malaysia	470 362	68 540	475 071	69 209
	Korea, Republic of	351 990	51 358	343 503	49 996
	Australia	227 262	33 099	249 523	35 877
	Taiwan	142 825	21 257	209 698	30 539
	New Zealand	184 007	26 861	161 928	23 287
	Indonesia	171 668	25 014	123 985	18 071
	Belgium	127 293	18 568	122 298	17 587
	Thailand	58 700	8 523	93 472	13 608
	Italy	37 157	4 869	88 430	12 534
	France	153 683	18 133	68 940	8 710
	Vietnam	24 650	3 585	56 011	8 178
	Cuba	123 335	13 914	72 600	8 165
	Costa Rica	7 662	1 119	51 295	7 441
	Chile	26 538	3 883	52 436	7 265
	Spain	48 900	5 548	36 935	5 735
	Guatemala	32 500	4 145	36 229	5 193
	Philippines	73 319	10 623	33 220	4 692
	Colombia	42 310	5 003	32 831	4 122

TABLE 1 (cont'd)

Item No.	1996		1997 ^p		
	(tonnes)	(\$000)	(tonnes)	(\$000)	
EXPORTS (cont'd)					
Venezuela	4 900	608	26 761	3 912	
India	10 500	1 537	20 242	2 960	
Fiji	9 985	2 362	16 520	2 717	
Dominican Republic	5 500	654	17 118	2 268	
Mexico	11 413	1 237	17 539	2 217	
Honduras	18 298	2 207	19 250	2 189	
Ecuador	14 800	1 708	15 947	1 978	
Denmark	31 527	3 468	15 750	1 773	
United Kingdom	57 072	7 545	9 072	1 128	
Argentina	3 500	513	4 700	678	
Jamaica	4 843	578	4 800	566	
Panama	–	–	3 000	363	
El Salvador	13 000	1 460	–	–	
Ireland	9 855	1 436	–	–	
Ivory Coast	12 000	1 430	–	–	
South Africa	9 639	1 380	–	–	
Nigeria	10 000	1 158	–	–	
Martinique	5 000	590	–	–	
Ghana	3 673	582	–	–	
Cameroon	1 080	449	–	–	
Pakistan	18	12	–	–	
Total	12 920 460 ^r	1 538 114 ^r	14 543 391	1 741 410	
3104.30	Potassium sulphate, in packages weighing more than 10 kg				
	United States	6 598	2 833	7 745	3 454
	Total	6 598	2 833	7 745	3 454

Sources: Natural Resources Canada; Statistics Canada.

– Nil; . . Not available or not applicable; . . . Amount too small to be expressed; ^p Preliminary; ^r Revised.¹ Countries are ranked in descending order of value, based on 1996 data.

Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, POTASH PRODUCTION AND SALES IN 1996, AND BY QUARTER, 1997

	Total 1996	1997				Total
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
(000 tonnes, K ₂ O equivalent)						
Production	8 041.9	2 335.8	2 338.8	1 884.8	2 468.1	9 027.5
Sales						
North America	4 688.4	1 239.7	1 831.8	1 351.3	1 361.8	5 784.6
Offshore	3 279.1	943.3	1 067.0	879.1	834.3	3 723.7
Total	7 967.5	2 183.0	2 898.8	2 230.4	2 196.1	9 508.3
Ending inventories						
Mine site	700.4	687.2	461.3	416.1	460.1	n.a.
Off site	720.4	735.8	668.4	336.0	476.4	n.a.
Total	1 420.8	1 423.0	1 129.7	752.1	936.5	n.a.

Source: Potash and Phosphate Institute.

n.a. Not applicable.

TABLE 3. CANADA, POTASH INVENTORY, PRODUCTION, DOMESTIC SALES AND EXPORT SALES, 1997

Month	Beginning Inventory	Production	Domestic Sales			U.S. Sales			North American Sales	Offshore Exports	Total Sales
			Agriculture	Non-Agriculture	Total	Agriculture	Non-Agriculture	Total			
(000 tonnes K ₂ O)											
January	1 420.8	693.9	5.0	2.8	7.8	276.7	38.6	315.3	323.1	230.7	553.8
February	1 509.6	722.8	6.3	2.9	9.2	529.3	37.8	567.1	576.3	308.7	885.0
March	1 318.2	919.2	8.4	2.6	11.0	288.6	40.6	329.2	340.2	404.0	744.2
Subtotal, 1st quarter		2 335.9	19.7	8.3	28.0	1 094.6	117.0	1 211.6	1 239.6	943.4	2 183.0
April	1 450.2	836.9	40.5	2.7	43.2	591.2	45.8	637.0	680.2	336.8	1 017.0
May	1 179.8	936.2	107.9	2.8	110.7	361.2	47.3	408.5	519.2	281.2	800.4
June	1 249.8	565.7	96.0	57.4	153.4	421.5	57.4	478.9	632.3	449.1	1 081.4
Subtotal, 2nd quarter		2 338.8	244.4	62.9	307.3	1 373.9	150.5	1 524.4	1 831.7	1 067.1	2 898.8
July	1 129.7	345.7	19.3	2.5	21.8	151.4	42.3	193.7	215.5	273.5	489.0
August	1 089.7	698.1	7.6	3.3	10.9	432.1	47.2	479.3	490.2	332.9	823.1
September	860.8	841.0	31.9	3.7	35.6	559.4	50.6	610.0	645.6	272.2	918.3
Subtotal, 3rd quarter		1 884.8	58.8	9.5	68.3	1 142.9	140.1	1 283.0	1351.3	879.1	2 230.4
October	752.1	859.9	38.4	3.7	42.1	442.4	49.3	491.7	533.8	230.8	764.6
November	811.9	746.1	16.6	2.4	19.0	310.9	55.3	366.2	385.2	192.6	577.8
December	953.2	862.1	21.4	3.0	24.4	358.0	60.1	418.1	442.5	411.0	853.5
Subtotal, 4th quarter		2 468.1	76.4	9.1	85.5	1 111.3	164.7	1 276.0	1 361.4	834.4	2 195.9
Total		9 027.6	399.3	89.8	489.1	4 722.7	572.3	5 295.0	5 784.1	3 724.0	9 508.1

Source: Potash and Phosphate Institute.

Note: Reported stocks at year-end total 936.5 Mt.

TABLE 4. CANADIAN POTASH, CURRENT SITUATION, 1989-97, AND FORECAST, 1998

	1989	1990	1991	1992	Actual					Forecast ¹
					1993	1994	1995	1996 ^r	1997 ^p	1998
(000 tonnes K ₂ O)										
Capacity	12 045	12 045	12 045	12 180	12 180	12 235	13 220	13 310	13 400	13 400
Production	7 333	7 002	7 402	7 270	6 850	8 182	9 065	8 042	9 025	9 300
Capacity utilization (%)	61	58	61	60	56	67	69	60	67	69
Sales	7 124	7 190	7 056	7 025	6 863	8 517	8 635	7 970	9 510	9 150
of which: Domestic	315	396	350	370	356	385	345	355	490	350
United States	3 886	3 630	3 610	3 945	4 048	4 560	4 495	4 335	5 295	5 200
Offshore	2 923	3 164	3 096	2 710	2 459	3 535	3 795	3 280	3 725	3 600
Year-end stocks	1 596	1 272	1 585	1 785	1 726	1 285	1 545	1 420	935	1 100
World production	29 310	27 452	26 035	24 036	20 407	22 687	24 231	23 279	25 350	26 000
World capacity ^r	37 480	37 765	36 905	36 432	35 345	35 445	36 000	35 975	35 890	35 600
Canada/world										
Production ratio (%)	25.0	25.5	28.4	30.2	33.6	36.1	37.4	34.5	35.6	35.8
Capacity ratio (%)	32.1	31.9	32.6	33.4	34.5	34.5	36.7	37.0	37.3	37.6

Sources: Natural Resources Canada; Potash and Phosphate Institute.

e Estimated; p Preliminary; r Revised.

1 Forecast by Natural Resources Canada.

TABLE 5. CANADA, POTASH MINES, CAPACITY PROJECTIONS, 1990-2001

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	(000 tonnes K ₂ O)											
Agrium Inc. Vade	815	815	830	830	830	930	1 020	1 110	1 110	1 110	1 110	1 110
Central Canada Potash Inc. ¹ Colonsay	830	830	830	830	-	-	-	-	-	-	-	-
IMC Kalium Canada Ltd. ² K1 and K2, Esterhazy (75%) Belle-Plaine	1 745	1 745	1 745	1 745	1 745	1 745	1 745	1 745	1 745	1 745	1 745	1 745
Central Canada Potash Inc., Colonsay	1 245	1 245	1 245	1 245	1 300	1 410	1 410	1 410	1 410	1 410	1 785	1 785
Subtotal	-	-	-	-	830	930	930	930	930	1 060	1 200	1 200
Subtotal	2 990	2 990	2 990	2 990	3 875	4 085	4 085	4 085	4 085	4 215	4 730	4 730
Potash Company of America ³ Patience Lake	630	630	630	-	-	-	-	-	-	-	-	-
Potash Corporation of Saskatchewan Inc. Allan	960	960	960	960	960	1 150	1 150	1 150	1 150	1 150	1 150	1 150
Cory	830	830	830	830	830	830	830	830	830	830	830	830
Esterhazy (25%)	580	580	580	580	580	580	580	580	580	580	580	580
Lanigan	2 090	2 090	2 090	2 090	2 090	2 335	2 335	2 335	2 335	2 335	2 335	2 335
Patience Lake	-	-	-	630	630	630	630	630	630	630	630	630
Rocanville	1 160	1 160	1 160	1 160	1 160	1 400	1 400	1 400	1 400	1 400	1 400	1 400
Subtotal	5 620	5 620	5 620	6 250	6 250	6 925	6 925	6 925	6 925	6 925	6 925	6 925
Total Saskatchewan	10 885	10 885	10 900	10 900	10 955	11 940	12 030	12 120	12 120	12 250	12 765	12 765
Potacan Mining Company of Canada ⁴ Clover Hill (Sussex)	780	780	810	810	810	810	810	810	-	-	-	-
Potash Company of America, Inc. ³ Penobsquis (Sussex)	380	380	470	-	-	-	-	-	-	-	-	-
Potash Corporation of Saskatchewan Inc. New Brunswick Division (Penobsquis)	-	-	-	470	470	470	470	470	470	470	470	470
Cassidy Lake Division (Cover Hill)	-	-	-	-	-	-	-	-	810	810	810	810
Subtotal	-	-	-	470	470	470	470	470	1 280	1 280	1 280	1 280
Total New Brunswick	1 160	1 160	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280
Total Canada	12 045	12 045	12 180	12 180	12 235	13 220	13 310	13 400	13 400	13 530	14 045	14 045

Source: Natural Resources Canada.

- Nil.

¹ Sold to Kalium Chemicals Company Limited in 1994. ² IMC Global Inc. merged with Kalium Chemicals in 1996. ³ Sold to Potash Corporation of Saskatchewan Inc. in 1993. ⁴ PMC underground mine was flooded in the fall of 1997; the operation was sold to Potash Corporation of Saskatchewan Inc. in early 1998.

TABLE 6. WORLD POTASH PRODUCTION, 1993-97

	1993	1994	1995	1996	1997e
	(000 tonnes K ₂ O)				
Brazil	173	242	223	234	275
Canada	6 850	8 182	9 065	8 042	9 025
Chile	35	52	52	179	235
China	60	90	100	100	100
C.I.S.	4 667	5 112	5 605	5 395	6 650
France	890	870	802	751	665
Germany	2 860	3 286	3 278	3 334	3 420
Israel	1 309	1 259	1 326	1 500	1 485
Italy	-	-	-	-	-
Jordan	822	930	1 068	1 059	850
Spain	661	684	650	680	640
United Kingdom	555	580	582	618	570
United States	1 525	1 400	1 480	1 387	1 435
Total	20 407	22 687	24 231	23 279	25 350

Sources: Natural Resources Canada; International Fertilizer Industry Association Ltd.; U.S. Geological Survey.