

higher yielding plant varieties were introduced. These factors meant much higher demand for plant nutrients both in Canada and abroad. The Canadian fertilizer industry responded by constructing larger, more efficient fertilizer plants and vastly improving existing transportation and distribution systems.

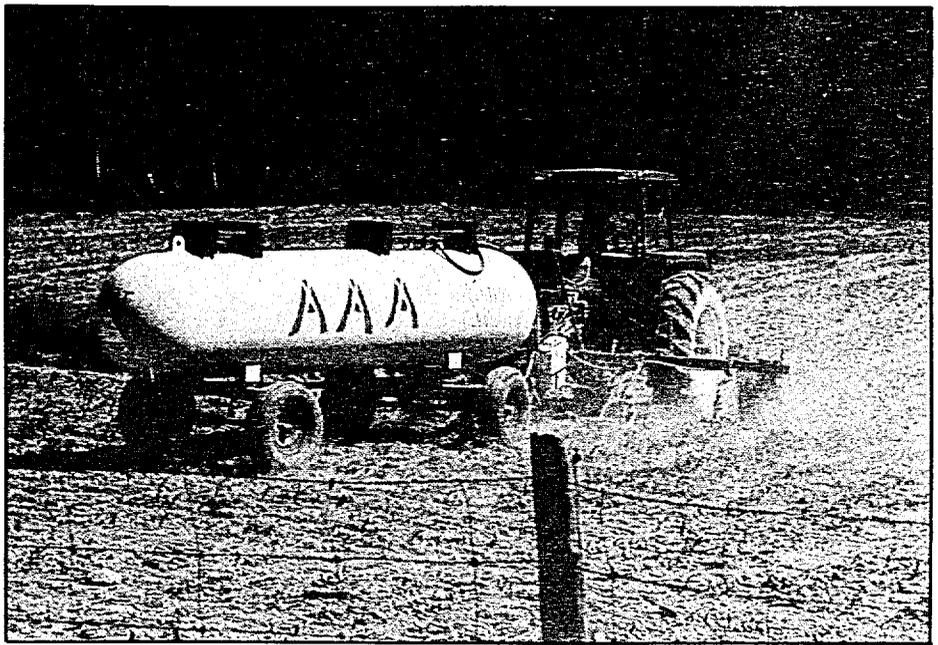
Canadian fertilizer production grew remarkably over the 1954 to 1984 period. This extraordinary growth is evident considering the fact that Canada, which produced no potash before 1962, now supplies 25% of the world demand for potash fertilizers. Nitrogen production increased by ten times over the course of the same thirty-year period; fully 6% of Canada's current natural gas production is used as both an energy source and a feedstock for production of nitrogen fertilizers.

The Three Nutrients

Intensive cropping results in the removal of large quantities of nitrogen, phosphorus and potassium from soils. Unless these elements are replaced in the soils in a form that can be absorbed by plant roots, crop yields will fall off by as much as 40%.

Air is more than 75% nitrogen by volume. However, atmospheric nitrogen is inert and save only in the case of legumes, is of no plant food value. Nitrogen from the air is combined with hydrogen under pressure in the presence of a suitable catalyst to make ammonia. Ammonia is both a basic fertilizer material and the building block for all other fertilizer materials that contain nitrogen. Natural gas from Alberta is the major source of energy and hydrogen for ammonia production.

Phosphorous is obtained from phosphate rock which is mined mainly in Florida and Idaho. As yet, there are no commercially



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viable phosphate rock deposits in Canada. Phosphate rock must be treated with sulphuric acid to produce phosphoric acid. Phosphoric acid is the building block for basic fertilizer materials containing phosphorous; Canada has abundant supplies of sulphur, a by-product of natural gas production and metal ore smelting and the basis of sulphuric acid.

Potassium is mined from underground deposits in Saskatchewan and New Brunswick. It is most often mined by underground excavation similar to coal mining but it is also solution-mined by pumping water into the ground to dissolve the mineral, which is then pumped to the surface. The extracted mineral is soluble but in impure form. Impurities are removed from shaft-mined potash by flotation methods and from solution-mined potash by evaporation and crystallization.

An efficient and innovative industry

Canada's fertilizer industry represents a capital investment of

approximately \$5 billion into state-of-the-art technology and world-class, high efficiency plants and machinery for converting natural resources into finished fertilizer products. Canada's fertilizer industry is capable of supplying almost all of the country's domestic fertilizer needs of over four million tonnes annually. It is capable of supplying a significant portion of nitrogen fertilizer needs and the major portion of potash fertilizer needs of the United States where fertilizer consumption is over 45 million tonnes annually. Canadian potash production is dispersed widely to North American and offshore markets.

In 1984, fertilizer exports from Canada had a value of \$1.67 billion. The Canadian fertilizer industry uses highly advanced technology and is an extremely innovative industry. In fact, its efficiency and productivity levels are used as a model for industries in other countries. With its access to vast supplies of energy and other natural resources, Canada's fertilizer industry looks forward to even further growth in the coming years. ■