Industrial Development Subsidiary Agreement

WORKING PAPERS:

FEASIBILITY ASSESSMENT OF AN ANHYDROUS AMMONIA PLANT IN THE PEACE RIVER REGION

NOVEMBER 1979

Research Report

Province of British Columbia
Ministry of Industry and Small Business Development

Government of Canada
Regional Economic Expansion

Gouvernement du Canada
Expansion Économique Régionale

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FEASIBILITY ASSESSMENT OF AN ANHYDROUS AMMONIA PLANT IN THE PEACE RIVER REGION

NOVEMBER 1979

Prepared for

PEACE LIARD REGIONAL DISTRICT
ECONOMIC DEVELOPMENT COMMISSION

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The responsibility for the content of this report is the consultant's alone, and the conclusions reached herein do not necessarily reflect the opinions of those who assisted during the course of this investigation or the Federal and Provincial Governments which funded the study.

TABLE OF CONTENTS

		Page
I	EXECUTIVE SUMMARY	i-vi
II	INTRODUCTION	1
	1.1 Project Background	1
	1.2 Study Objective	2
	1.3 Approach and Scope	2
	1.4 Progress to Date	9
	1.5 Project Emphasis	11
III	MARKET ANALYSIS (Phase I)	12
	1.0 Introduction	12
	2.0 Agricultural Demand	13
	2.1 Region I	13
	2.1.1 Total Nitrogen Fertilizer Demand .	13
	2.1.2 Anhydrous Ammonia Demand	14
	2.1.3 Pricing	15
	2.1.4 Factors Influencing Demand for Anhydrous Ammonia	16
	2.1.5 Seasonality	19
	2.1.6 Application Rates	19
	2.1.7 Logistics	20
	2.2 Region II	21
	2.2.1 Nitrogen Fertilizer Demand	21
	2.2.2 Pricing	23
	2.2.3 Seasonality	24
	2.2.4 Application Rates	24
	2.2.5 Logistics	25
	2.2.6 Quotas	26
	2.3 Region III	26
	3.0 Forestry Demand	29
	3.1 British Columbia - Regions I and II . . .	29
	3.2 Region III	31
	4.0 Industrial Demand	34
	5.0 Offshore Demand	35
	6.0 Conclusions	37

TABLE OF CONTENTS CONTINUED

		Page
IV	ENGINEERING - ECONOMIC ANALYSIS (Phases II and III)	38
	1.0 Introduction	38
	2.0 Ammonia Plant Costing and Feedstock Analysis	38
	2.1 Ammonia Plant Costing Analysis	38
	2.2 Natural Gas Supply and Cost	44
V	CONCLUSIONS	47

APPENDICES

A. Study Terms of Reference
B. Selected Statistical Tables (1-54) (see separate Table of Contents)
C. Bibliography
D. Individuals and Organizations Contacted

I EXECUTIVE SUMMARY

1.0 INTRODUCTION

The Peace-Liard Regional District commissioned consultants to undertake a feasibility study of establishing an anhydrous ammonia plant in the Peace River region. The study indicated there were some serious questions as to the feasibility of the proposed plant.

The following is a summary of the salient findings:

2.0 MARKET ANALYSIS

The market findings, presented below, consider each application of anhydrous ammonia and its derivatives for the applicable market areas.

2.1 Agricultural Demand

Region I - (Peace River area of British Columbia and Alberta) - Anhydrous ammonia is a relatively new product in this area. Demand for anhydrous ammonia in 1980 is expected to total 10,900 tonnes, of which the B.C. Peace River's share will be some 25 percent. Substantial growth is expected and by 1990, total demand in Region I is projected to be 48,500 tonnes, i.e. 40% of total nitrogen fertilizer demand. To place these figures in perspective, however, total

expected 1990 demand for anhydrous ammonia could be met by one plant producing 140 tonnes per day; if a proposed plant could capture 1/3 of market demand by 1990, the production requirements could be met by producing 45 tonnes per day, approximately 3-5% of daily production at competing plants.

Region II - (Remainder of B.C.) - Current nitrogenous fertilizer demand in Region II comprises approximately 40% of total provincial demand. No anhydrous ammonia is used in Region II for reasons mainly relating to the topography, the types of crops harvested and the lower levels of, and more geographically dispersed, demand for nitrogenous fertilizer.

The use of derivatives of anhydrous ammonia as nitrogenous fertilizers has been on the increase over the past 3-4 years and further increases are expected, particularly in the use of urea and custom blended fertilizer.

Region III - (U.S. and Pacific Rim) - Demand for nitrogenous fertilizers has shown significant increase during the past decade. During the period 1970 to 1978, for example, anhydrous ammonia demand increased 32%, while urea demand increased over 87% in the U.S. Pacific and Mountain states. Both harvested crop averages and nitrogen application rates are increasing, thus increasing demand for nitrogenous fertilizers.

2.2 Forestry Demand

Regions I and II - Demand for urea (1979) as a forest fertilizer was approximately 11,800 tonnes. Dramatic growth over the 1978 level of 2,800 tonnes was observed mainly due to an increase in usage on the part of the British Columbia Ministry of Forests. Future increases in demand by private industry can be expected as a consequence of the New Forest Act which provides cost reimbursements to companies engaging in forest fertilization.

Region III - Application of nitrogen-based fertilizers to forested land in Washington and Oregon has grown rapidly in the past decade. The greater prevalence of privately owned forest land is a major factor in the growth pattern which was 8,000 hectares (20,000 acres) fertilized in 1969, while some 200,000 hectares (500,000 acres) are predicted to be fertilized annually in the decade 1980-1990. This would result in annual forestry-grade urea demand of 100,000 tonnes.

2.3 Industrial Demand

British Columbia has a small share in the market of explosive-grade ammonium nitrate, probably consuming less than 22,700 tonnes annually; it is estimated that the British Columbia pulp and paper industry consumes 50% of the ammonia used for "cooking acid", which would amount to less than 22,700 tonnes annually and

demand in this sector is expected to decline. On the whole, industrial demand for ammonia in British Columbia is very likely lower than the national average and probably ranges between 10-15 percent of total ammonia-derived demand.

2.4 Export Demand

A number of countries rely very heavily on foreign sources for their supply of nitrogen fertilizers. International trade data for 1977 indicates that the U.S. is the greatest importer of nitrogenous fertilizers, importing over 1.6 million tonnes of actual N, followed by China and India at approximately 750,000 tonnes each. High demand should continue as some 45% of existing Japanese urea production capacity was reportedly scheduled for discontinuation in 1979, thereby leaving a supply gap of significant size.

3.0 ANHYDROUS AMMONIA PLANT COSTING AND FEEDSTOCK ANALYSIS

This section of the study addressed the engineering-economics of anhydrous ammonia production over a range of plant sizes in British Columbia and Alberta, as well as the cost and availability of natural gas, the plant's feedstock.

3.1 Anhydrous Ammonia Plant Costing Analysis

The economics of anhydrous ammonia production was examined for plant sizes of 90, 180 and 545 tonnes

per day in British Columbia and for plant sizes of 545, 910 and 1,360 tonnes per day in Alberta. There are substantial economies of scale in production. Moreover, production costs for a similar plant size (545 tonnes per day) are lower in Alberta than in British Columbia because of assumed advantage on purchase price of natural gas.

3.2 Natural Gas Supply and Cost

The natural gas requirements for a 180 tonnes per day plant of some 198.3 thousand m^3 day (7,000 Mcf/day) or 70.8 million m^3 year (2.5 Bcf/year) would not be a serious supply problem in the areas under consideration. The most representative costs for natural gas service to a large volume industrial customer in north-east British Columbia in 1980 are as follows:

Large Volume Firm Service:	6.9 - 7.6¢/m^3 ($1.95 - 2.15/Mcf)
Large Volume Interruptible Service:	6.4 - 7.2¢/m^3 ($1.80 - 2.05/Mcf)

4.0 CONCLUSIONS

a) The Market Analysis points up that a "small" scale anhydrous ammonia plant (e.g. 90 tonnes per day) can only be considered in terms of anhydrous

ammonia sales to Regions I and II. The Engineering/ Economic Analysis indicates that an anhydrous ammonia plant of 545 tonnes per day approximates the smallest plant scale while maintaining competitive production costs.

b) These findings indicate that a single-purpose plant producing only anhydrous ammonia, in the Peace River Region, is not a viable proposition.

c) The derivative production of urea has some merit, particularly in relation to the forestry sector and the export market. It should be borne in mind, however, that about 272,000 tonnes of urea would be produced annually from 455 tonnes per day ammonia feedstock - a very large quantity indeed to market (i.e. the total forestry demand for urea fertilizer is about 90,000 - 100,000 tonnes per year; British Columbia's 1978 demand for urea in agriculture was only about 13,600 tonnes).

1.2 Study Objective

The purpose of the study is to evaluate the feasibility of establishing an anhydrous ammonia plant in north-east British Columbia or north-west Alberta which would have, as its primary focus, the satisfaction of that region's demand for anhydrous ammonia. The assessment is to define and evaluate the proposed plant's market areas, determine the capital and production costs of the proposed plant, evaluate the economic feasibility of such a regionally-oriented plant and recommend the realistic course of action which should be considered.

1.3 Approach and Scope

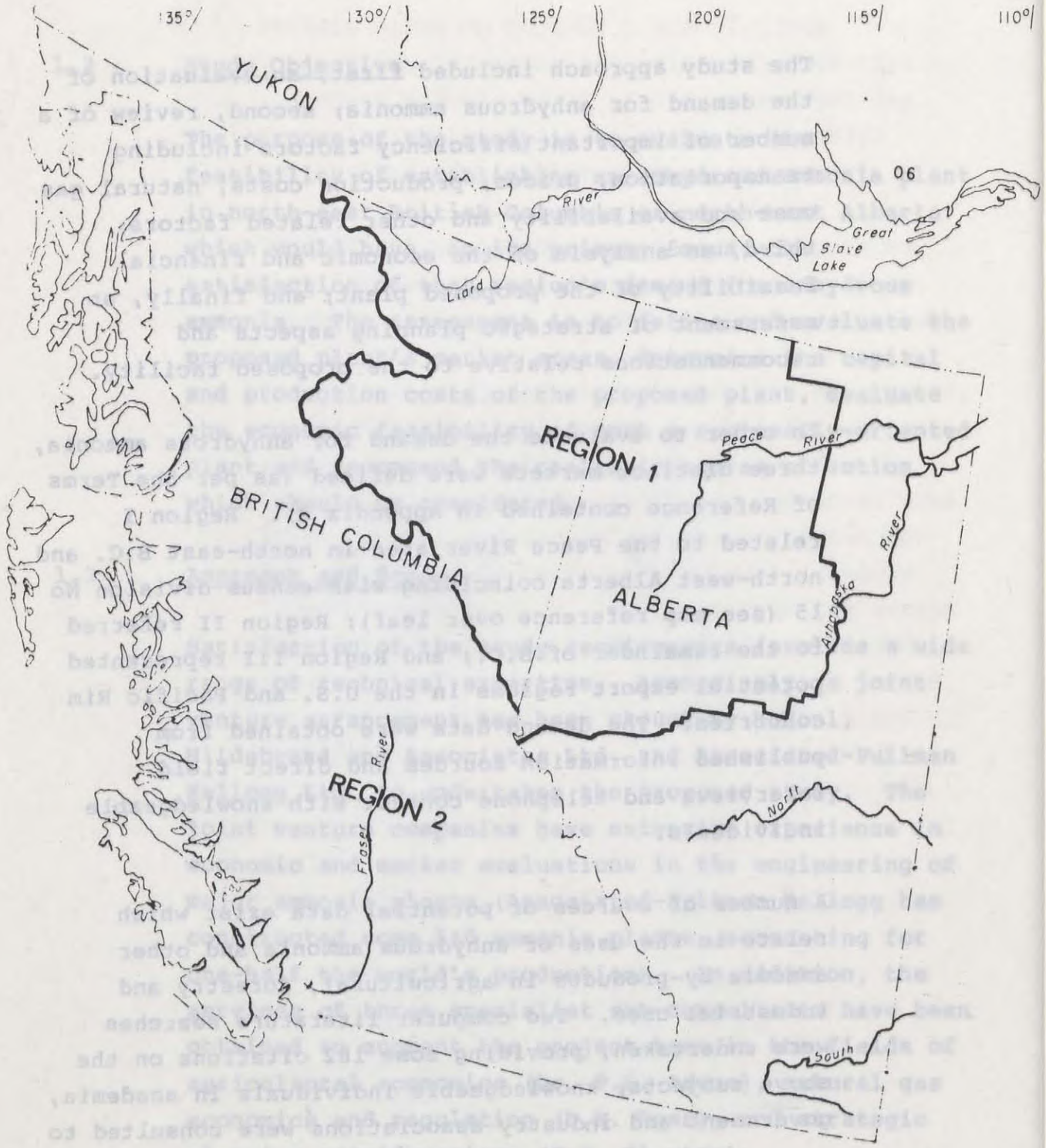
Satisfaction of the study requirements involves a wide range of technical expertise. Accordingly, a joint venture arrangement has been struck by McNeal, Hildebrand and Associates Ltd. and Associated-Pullman Kellogg Ltd. to undertaken the proposed study. The joint venture companies have extensive experience in economic and market evaluations in the engineering of major ammonia plants (Associated-Pullman Kellogg has constructed some 140 ammonia plants, accounting for one-half the world's production). In addition, the services of three specialist sub-consultants have been obtained to augment the project team in the fields of agricultural economics (Dr. P.L. Arcus), natural gas economics and regulation (D.W. Ross), and strategic planning considerations (G.W. Clayton).

The study approach included first, an evaluation of the demand for anhydrous ammonia; second, review of a number of important efficiency factors including transportation, prices, production costs, natural gas cost and availability and other related factors; third, an analysis of the economic and financial feasibility of the proposed plant; and finally, an assessment of strategic planning aspects and recommendations relative to the proposed facility.

In order to evaluate the demand for anhydrous ammonia, three distinct markets were defined (as per the Terms of Reference contained in Appendix A). Region I related to the Peace River area in north-east B.C. and north-west Alberta coinciding with census division No 15 (see map reference over leaf); Region II referred to the remainder of B.C.; and Region III represented potential export regions in the U.S. and Pacific Rim countries. The demand data were obtained from published information sources and direct field interviews and telephone contact with knowledgeable individuals.

A number of sources of potential data exist which relate to the uses of anhydrous ammonia and other ammonia by-products in agricultural, forestry and industrial uses. Two computer literature searches were undertaken, providing some 182 citations on the above subjects; knowledgeable individuals in academia, government and industry associations were consulted to

MAP OF REGIONS 1 & 2



obtain further references; and a variety of statistical data (Appendix B of this report) from sources including Statistics Canada, Western Canada Fertilizer Association, Department of Industry, Trade and Commerce, Tennessee Valley Authority, FAO, and other organizations were also collected and analyzed. A bibiliography of the most relevant sources of potential information is included as Appendix C.

The second, and most important source of demand data was an extensive field contact and telephone interview program. In this regard, the consultants developed an interview questionnaire to standardize the information collected.

The purpose of the interview program was to obtain detailed information on the uses of anhydrous ammonia and its derivatives, particularly in Regions I and II. In these two regions, the major sources of demand were found to be agriculture and forestry, where anhydrous ammonia and its derivatives are used as nitrogen fertilizers. The interviews were structured in three phases: the production aspects of the crops/forests with respect to the use of nitrogen fertilizers, demand for nitrogen fertilizers, and supply of nitrogen fertilizer. The first section, production aspects, endeavoured to identify the responsiveness of crops/trees to the application of nitrogen fertilizers, the form in which the fertilizer is applied (i.e., anhydrous, urea), application rates,

and future patterns in forestry and agriculture. The second section, demand for nitrogen fertilizer, determined the historic consumption of anhydrous ammonia and its derivatives, factors affecting demand, patterns in fertilizer usage, price elasticity of demand, seasonality, logistics, market areas, and expected future demand for anhydrous ammonia and other nitrogen fertilizers. Finally, supply aspects were addressed, including determination of the suppliers of various products, evaluation of price variations, ammonia production capacity, factors limiting supply, locational aspects relating to a new anhydrous ammonia plant, and whether or not fertilizer distributors would carry products from a Peace River plant. Although an extensive volume documenting the details of each interview was prepared by the consultants, for purposes of maintaining confidentiality it will not be publicly distributed.

The scope of the interview program was structured according to the Terms of Reference whereby Region I (The Peace River region) was most heavily emphasized in terms of direct field contact. Some 23 organizations were interviewed directly by the consultants and these included fertilizer distributors (feed and seed companies, grain elevators, co-operatives), major farmers in the area, Federal Department of Agriculture staff, provincial Ministry of Agriculture staff (B.C. and Alberta), an agricultural consultant and an anhydrous ammonia applicator contractor.

A similar interview program, of lesser scale, was completed for Region II (the remainder of B.C.). Some 22 organizations were contacted (mainly by interview) including fertilizer distributors and B.C. Ministry of Agriculture staff. In addition, the use of ammonia-based fertilizers in forestry was discussed with a number of organizations involved in forest fertilization, including the B.C. Ministry of Forests.

Some 19 organizations were contacted relative to Region III (potential export markets) demand. The information sought for this region was much more "macro" in scale and was more concerned with international ammonia trade than the specific situations confronting individual distributors, producers or purchasers.

The results of the literature search and interview program produced estimates of the demand for anhydrous ammonia relative to a small plant located in the Peace River area. A list of all contacts made by the consultants is contained in Appendix D.

The second section of the study dealt with a number of important efficiency factors relative to the ammonia industry. The issues examined included transportation prices, production costs, and natural gas cost availability.

Transportation of anhydrous ammonia and its derivative products adds very substantially to the final goods price. It was therefore considered important to determine the costs of the transportation mode(s) utilized by distributors and other purchasers of ammonia products F.O.B. plant and to recognize logistical difficulties. This information was borne out during our interview program.

Information on prices was also obtained. This included anhydrous ammonia and its derivative products, and related to the degree of price uniformity between competing suppliers and between different regions.

Production costs were estimated for ranges of plant sizes in both British Columbia and Alberta locations. Costs of production were assessed in terms of the fixed capital expenditures for the plant and the variable production costs such as feedstock and fuel, electricity, cooling water, boiler feed water, labour and plant overhead. The results of this analysis were the variations in the average cost per tonne of ammonia over a range of plant sizes and locations.

As it is probable that natural gas would be used as feedstock (and fuel) for the proposed plant, it was deemed important to assess the cost and availability of natural gas to a proposed ammonia plant in British Columbia or Alberta. In this regard, discussions were

held with senior officials at B.C. Petroleum Corporation and the B.C. Energy Commission, and a review of current regulations and policies regarding natural gas pricing and exports was undertaken. The analysis produced expected price ranges for firm and interruptible gas in B.C., and expectations of the price of Alberta gas in relative terms.

The third phase of the project was an economic analysis of the proposed plant. This phase drew upon the market demand information uncovered in Phase I and the ammonia production aspects assessed in Phase II. The purpose of this analysis was to evaluate the level of production that a proposed ammonia plant would have to meet in order to satisfy the expected demand for its products; then, the costs of producing this level of output were compared to the prevailing market price to determine the competitiveness of the proposed plant.

With the analysis completed, the final phase of the project was devoted to assessing the results and providing recommendations relative to the direction the project should take.

1.4 Progress to Date

The results of the analysis undertaken to date are documented in the following section. These results were formulated and presented as a Progress Report to the Economic Development Commission of the Peace-Liard

Region, the B.C. Ministry of Industry and Small Business Development and the Federal Department of Regional Economic Expansion at a progress meeting November 8, 1979. At that point in the study, the market demand phase had largely been completed and the important factors relating to production costs, prices of competing sources of ammonia, and natural gas cost and availability had all been evaluated. Accordingly, the consultants had undertaken a preliminary assessment of the feasibility of this project and found it to be very seriously in question.

The purpose of the progress meeting and this report was therefore to convey these findings to the clients in order to present them with a clear picture of the questionable feasibility of the project at that point in the study and to suggest to them that alternate courses of action, including termination of the study, should be considered.

After a thorough review of the consultants' findings and much deliberation by the parties involved, the decision to terminate the project was made.

Accordingly, the consultants did not complete the proposed work program and undertook no further research than what had been undertaken prior to November of 1979. The ensuing documentation of findings must be considered in its proper perspective. It is a progress report, prepared in a terse and summary form, bearing little resemblance to what a final report would have looked like, had the study been completed.

1.5 Project Emphasis

At this point, it should be re-iterated that the purpose of undertaking the study in the first place was to assess the feasibility of adding value to the natural gas fields indigenous to the Peace River area, in the form of an anhydrous ammonia plant. The outlook was, from the Terms of Reference, regional in perspective. The proposed plant was never conceived as world-scale; rather, it was proposed that it should have, as its primary focus, the satisfaction of demand for anhydrous ammonia in the Peace River regions of British Columbia and Alberta. Of secondary importance was the penetration of other British Columbia markets and of least relative importance, penetration of the export markets. The study was aimed at evaluating the feasibility of a small, regionally-oriented, anhydrous ammonia plant in the Peace River area.

III MARKET ANALYSIS (Phase I)

1.0 INTRODUCTION

The Market Analysis conducted over the September/ October period is largely complete. The report herein summarizes our findings. Additional qualitative details relating to the various markets are included in a statistical profile of ammonia and fertilizer demand and supply (provided as Appendix B of this report). Specific market details were also collected during the extensive interview program but cannot be released for purposes of retaining confidentiality.

The elements of the Market Analysis discussed below include:

- Agricultural Demand
  - Region I
  - Region II
  - Region III
- Forestry Demand
  - Regions I and II
  - Region III
- Industrial Demand
- Offshore Demand
- Conclusions

2.0 AGRICULTURAL DEMAND

2.1 Region I

2.1.1 Total Nitrogen Fertilizer Demand

Current nitrogenous fertilizer demand for the Peace River Region was estimated based on rates of application to field crop acreages and marketing/ distribution data supplied to the consultants during the field interview program. A forecast to 1990 was developed therein reflecting increased crop acreage, trends in application rates and related factors. Demand estimates are:

Total Nitrogenous Fertilizer Demand
for Peace River Region
(tonnes of N)

	1980	1990
Alberta	40,419	75,884
British Columbia	11,408	23,612
	51,827	99,496

The above demand estimates can be placed in perspective in terms of ammonia production. The region's entire 1980 nitrogen fertilizer demand could be met by one ammonia plant producing 180 tonnes per day; the 1990 demand could be met by one plant producing 350 tonnes per day.

The B.C. Peace River Region accounts for some 60% of the provincial demand for nitrogen fertilizer in agricultural use; the Alberta Peace River Region accounts for some 16% in that province.

2.1.2 Anhydrous Ammonia Demand

The 1980 demand for anhydrous ammonia is estimated from the interview program as follows:

1980 Anhydrous Ammonia Demand

	Anhydrous Ammonia (tonnes)	% of Total Nitrogen Fertilizer Demand
Alberta	8,165	16.6%
British Columbia	2,720	19.6%
Total Peace River	10,885	17.2%

The current (1980) demand for anhydrous ammonia is very small relative to plant production and represents some 32 tonnes per day production.

Anhydrous ammonia is a relatively new product to the Peace River area (e.g. 3 years in Grande Prairie; 2 years in Fort St. John; 1 year in Dawson Creek). Its market share will increase over the period to 1990. Assuming a 40% market share of 1990 nitrogen fertilizer demand, total anhydrous ammonia demand in

the Region would increase to 48,535 tonnes. This demand level could be met by one ammonia plant producing 140 tonnes per day.

The proposed anhydrous ammonia plant would, of course, only capture a portion of the regional market. If the proposed plant could capture 1/3 of market demand by 1990 (e.g. 16,000 tonnes), the production requirements could be met by some 45 tonnes per day production.

2.1.3 Pricing

There is a good deal of fertilizer price uniformity throughout the Peace River Region. The farmer co-operatives (i.e. Alberta Wheat Pool, United Grain Growers) adopt an average price structure for nitrogen fertilizers in Western Canada. Other producers/ distributors in the region follow similar area pricing strategies and, consequently, prices are fairly uniform throughout the region.

Current (October, 1979) fertilizer prices for the primary nitrogen fertilizers are as follows:

	Fort St. John	Dawson Creek	Grande Prairie
	(cents/Kg of N)		
Anhydrous Ammonia (82% N)	42.3	38.4-41.0	38.4
Ammonium Nitrate (34% N)	44.3	45.0	45.0
Urea (45% N)	42.1	42.1	42.1

2.1.4 Factors Influencing Demand for Anhydrous Ammonia

There are a number of factors that influence, both positively and negatively, the demand for anhydrous ammonia.

On the positive side, anhydrous ammonia is generally the lowest cost fertilizer per kilogram of nitrogen. As can be observed in the table above, anhydrous ammonia is the cheapest source of nitrogen in Dawson Creek and Grande Prairie; in Fort St. John anhydrous ammonia was marginally higher in cost than urea, but the price of urea relative to anhydrous ammonia is expected to rise in the Spring of 1980.

Application of anhydrous ammonia to previously unfertilized land has, in many cases, tripled or quadrupled crop yields. The increases in yield and financial performance related thereto are likely the most significant factors affecting fertilizer demand.

The technique by which anhydrous ammonia is applied tends to increase demand for this product relative to dry fertilizers. Specifically, the anhydrous ammonia is drilled 3-6 inches into the soil in liquid form, thereby making it wind resistant. Susceptibility to wind is a problem in the case of dry fertilizer applied to the surface of the soil.

Technological advancements such as the cold-flo and double-shooting methods have also increased demand for anhydrous ammonia. With the cold-flo process, the ammonia can be applied during cultivation as a liquid. The anhydrous product in this instance is not deeply applied during tillage; this application method could help in bad weather conditions or during rush periods. However, on the down-side, there is some loss of the beneficial elements from the placement effect.

The double-shooting method, which is being practised in the United States, refers to the simultaneous application of anhydrous ammonia and P_2O_5 (liquid P_2O_5, which is 10% nitrogen and 34% phosphate). This process entails two separate lines on the shank truck, and has resulted in yields 10-15% above those realized when the two products are applied in the conventional methods.

There are, however, a number of factors which impact negatively on the demand for anhydrous ammonia. Anhydrous ammonia requires special storage and application facilities and equipment, which are very costly to obtain. The equipment and truck are about $45,000 and $35,000 respectively, totalling some $80,000, while a 90 tonne storage tank is in the order of $80,000-85,000. The components total some $160,000, which is expensive for the short period of use, (65-70 days per year).

Transportation of anhydrous ammonia is costly and, by rail, time-consuming. The product must be moved in large tanks; transport costs can represent over 10% of the price. Acquisition of anydrous ammonia can be a time-consuming process for a couple of reasons. First, the seasonal nature of application, combined with a general shortage of storage facilities, means that end users of anhydrous ammonia want the product at the same time. Second, rail transport, by definition, is not as flexible as truck transport and it can take as long as a week to receive a rail shipment. Truck transportation is, in the B.C. market, much more time-efficient.

Unlike dry fertilizers, application of anhydrous ammonia does not lend itself to combination with herbicides. For example, urea can be combined with herbicides and used very effectively.

The extensive soil preparation and short growing season in the Peace River area both exert negative influence on the demand for anhydrous ammonia. Many farmers just do not have the time to apply anhydrous ammonia. For instance, if there is bad weather in the fall, demand will be negligible; if it is dry in the fall, anhydrous ammonia will move in large volumes.

Application of anhydrous ammonia sometimes causes the precipitation of carbonates. This can impede crop growth.

The method of application of anyhydrous ammonia limits the scope of its use. It is economic if the area to which it is applied is large in area and predominantly flat; it is not economic to apply it to areas characterized by pockets of agricultural development. Moreover, if anhydrous ammonia has to be applied with a cultivator, then it cannot be used for perennnial crops because it would tear up the sod.

2.1.5 Seasonality

Demand for anydrous ammonia is highly seasonal. In general, anhydrous ammonia is applied over a 40 day period in the spring, usually encompassing part of April and all of May; it is applied over a 30 day period in the fall, usually in the late September-October period.

2.1.6 Application Rates

Crops	Kilograms of N per Hectare
Cereal grains (Wheat, Oats, Barley Rye)	56-67
Oilseeds (Rapeseed, Flaxseed)	57-112

Application rates have increased over the past 3 to 4 years with introduction of anhydrous ammonia to the Region.

2.1.7 Logistics

The logistics patterns for anhydrous ammonia and dry nitrogren fertilizers can be described in terms of transportation, storage, product handling and local distribution.

Anhydrous ammonia and dry nitrogen fertilizers are shipped to the Region by both truck and rail. Truck transport's share is proportionately higher in the Alberta Peace River Region because of cost-effective intraprovincial rates. Examples include Calgary-Grand Prairie $20 per tonne; Medicine Hat-Grand Prairie $40 per tonne; Fort Saskatchewan-Grand Prairie $20 per tonne. Producers often engage in "swap" arrangements to minimize transport costs (e.g. Medicine Hat swaps with Fort Saskatchewan).

In the B.C. Peace River Region, trucking rates are relatively higher because of the extraprovincial nature. For example, Fort Saskatchewan to Fort St. John rate is $50 per tonne.

Truck service to the area can be provided within 48 hours; rail deliveries usually require 7-10 days.

Most distributors in the Peace River Region are on quotas and transportation service is important when additional product becomes available.

Storage is a serious problem in the Region. Most distributors have little storage facilities and farmers frequently have no storage facilities. Storage facilities for anhydrous ammonia are expensive (e.g. a 90 tonne tank costs approximately $80,000). Mini-bulk (.9 tonne bags) for dry fertilizer is now becoming common in the Region because of storage unavailability. Industry experts maintain that the Peace River Region's storage and transportation services should be improved, thereby reducing the requirement for a regional plant.

Anhydrous ammonia also requires costly, specialized equipment. An applicator unit (i.e. truck plus two applicators) costs approximately $80,000. The distributor of anhydrous ammonia usually services a 48-64 km radius. The applicator is delivered to the farm gate for the farmer's use.

2.2 Region II

2.2.1 Nitrogen Fertilizer Demand

Current nitrogenous fertilizer demand in Region II represents approximately 40% of total provincial demand. Anhydrous ammonia is not used in Region II in spite of its low cost per kg of nitrogen. A number of

factors cause this to occur. First, anhydrous ammonia is most efficiently applied over large stretches of flat land; this is not charactertistic of Region II. Second, anhydrous ammonia is likely applicable only to annual crops which require high levels of nitrogen; much of Region II agriculture is in the form of perennial crops and the method by which anhydrous ammonia is drilled into the soil might pull up the roots or sod on which perennial crops are grown. In some cases, such as orchards, the method of application is simply too awkward to be used. Moreover, much of the agricultural product found in Region II is equally or more responsive to phosphates (in some cases, potassium) than to nitrogen. Nitrogen would be used, but often is used in equal or smaller quantities than the other primary nutrients. Third, distributors in Region II would have to purchase storage tanks and applicators before anhydrous ammonia could be made available to farmers. For this to occur, high levels of demand for anhydrous ammonia would have to be expressed to them by the farmers, something which would not likely occur without the support of local Ministry of Agriculture officials, who at present are not recommending its use. In short, there are a number of important negative factors inhibiting demand for anhydrous ammonia in Region II.

Over the past three to four years, the use of nitrogen fertilizers has increased fairly significantly. Further increases, particularly in the use of urea and

custom blended fertilizers, are anticipated. Demand for anhdyrous ammonia is not expected to arise, although it could be applied in several areas (most notably the Creston area). The few areas in which it would be viable are spread widely across Region II. Large increases in nitrogen demand, should they occur in this region, will probably be in the form of dry fertilizers, likely urea.

2.2.2 Pricing

Wide variations in the prices of the various nitrogen fertilizers supplied are observed in Region II. Naturally, much of this variation can be explained by the transportation costs incurred in each area, but local price differentials of a significant magnitude can be observed. For example, the price charged for a tonne of urea in Kamloops differs by $17 between two suppliers. The price charged on ammonium nitrate by each of the suppliers differs by $14 per tonne.

On the whole, local prices in Region II appear to be much less uniform than they are in Region I. This is likely due to the higher volumes purchased by each farmer in Region I and a greater price elasticity of demand in that region.

Current (October, 1979) prices for the primary nitrogen fertilizers in Kamloops are as follows:

Kamloops
Prices for Primary Nitrogen Fertilizers

	Buckerfields	Purity Feed	Local Price Variations
Urea per tonne	$214	$197	$17
Ammonium Nitrate per tonne	176	162	14

2.2.3 Seasonality

Demand for nitrogen fertilizers is very seasonal in Region II. Most of the fertilizer is applied in the spring with the peak period usually occurring between the beginning of April and the middle of May. Some fertilizer is used in the fall but the volume of fall demand is not comparable to the peak demand experienced in the spring.

2.2.4 Application Rates

The following table illustrates recommended application rates for the principal agricultural products in Region II:

Crop	Kg/N per Hectare
Alfalfa	22 - 34
Grass Hay	39 - 67
Timothy	28
Grains	34 - 56
Corn (ensilage, fodder)	129 - 140
Barley Silage	34 - 39
Oats (fodder)	17
Vegetables (leafy)	90 - 112
- potatoes	112
Tree Fruits	84
Small Fruits	101
Nursery	112
Turf	225 - 337

These are recommended application rates which, it should be noted, are not always followed closely by the Region II farmers. In fact, a wide variety of actual application rates are observed.

2.2.5 Logistics

For the most part, Region II distributors have their product transported by truck from their Alberta suppliers. A great deal of lumber is transported by truck from B.C. to Alberta and, as a consequence, trucking companies usually give fertilizer distributors favourable backhaul rates, rendering truck transportation cheaper than rail.

The problem of storage is dealt with in several different ways. One method is to begin purchasing fertilizer in the late fall and press the farmers to

make early purchases, in an effort to minimize the peak demand problems which occur in the spring. Some distributors accept the storage problem and maintain a large storage space to accommodate the substantial volumes required at peak demand. Others maintain only an operating inventory and place orders with the suppliers as they are received. Distributors using this system are most adversely affected by the peaking nature of fertilizer demand. On the whole, storage is a very difficult problem to deal with due to the high cost of maintaining sufficient inventory space for a two-to-three month market and the general lack of fertilizer storage facilities on farms.

2.2.6 Quotas

A large number of the distributors indicate that they are limited in the amount of nitrogen fertilizer they can purchase from their supplier(s). These quotas are usually established based on the previous year's sales by the distributor and are probably used by the manufacturers to plan production schedules.

2.3 Region III

Demand for anhydrous ammonia in the Pacific and Mountain states of the U.S. has increased by almost 150% between 1960 and 1978.[1] Since 1975, however, demand has actually decreased by 4%.

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[1]Fertilizer demand information was obtained from 1978 Fertilizer Summary Data, Tennessee Valley Authority.

The amount of increase in the demand for anhydrous ammonia varies widely from one state to another. In Colorado, demand for anhydrous ammonia increased from 8,391 tonnes in 1960 to 71,420 tonnes in 1978. In Nevada, however, usage declined between 1960 and 1978 with 587 and 475 tonnes used respectively. Substantial amounts of anhydrous ammonia are used in both Washington, 62,238 tonnes in 1978, and Idaho, 45,189 tonnes in 1978.

Demand for nitrogen fertilizers has, in general, increased very substantially in Region III. Of major significance has been the rapid growth in urea demand which has increased by over 500% between 1960 and 1978. It appears that urea is beginning to displace demand for ammonium nitrate; in the Pacific States ammonium nitrate usage has decreased between 1976 and 1978, while urea usage has increased during the same period. This trend can be expected to continue since urea is less expensive per kg of nitrogen than ammonium nitrate.

In most cases, as we can observe from the following table, both harvested crop acreages and the nitrogen application rate are increasing, thereby creating a demand for more nitrogen fertilizer.

Trends in Harvested Crop Acreages
and Application of Nitrogen Fertilizer
in Pacific and Mountain States 1970-78

	Increase (Decrease) in Harvested Crop Acreage	N. Application Rate
Pacific States		
Oregon	14%	45%
Washington	13%	22%
California	12%	(3%)
Mountain States		
Montana	9%	267%
Idaho	16%	59%
Wyoming	6%	n/a
Colorado	2%	n/a
Utah	(1%)	n/a
Nevada	(7%)	n/a

Source: 1978 Fertilizer Summary Data, TVA.

During the period 1970 to 1978, anhydrous ammonia demand increased some 32% while urea demand increased over 87%.

These statistics point to a continued increase in the demand for nitrogen fertilizers for agricultural purposes in Region III. However, an accurate assessment of this market's potential would require a more intensive evaluation based on contact with knowledgeable individuals and key organizations intimately involved in the Region III agricultural market.

3.0 FORESTRY DEMAND

Obviously, no anhydrous ammonia is or can be used in forest fertilization with present application methods. Urea (46% N) is used instead. It is applied in either granular or forest-grade (.48 cm or 3/16" pellets) form and is generally applied by helicopters utilizing gasoline powered rotary spreaders capable of 103 km-wide swaths. Nitrogen fertilization is currently limited to Douglas Fir stands.

3.1 British Columbia - Regions I and II

Demand for urea (1979) as a forest fertilizer is approximately 11,800 tonnes of product. In B.C., all urea applied to forests is forest-grade. The major user at the present time is the B.C. Ministry of Forests, who currently apply about 8,890 tonnes of urea to 20,000 hectares (50,000 acres). A number of forestry companies are also involved in forest fertilization, but due to the dominance of Crown land (roughly 95% of B.C. forest land) quantities applied are much lower. Crown Zellerbach and Pacific Logging are the two largest private sector users, applying 744 and 590 tonnes respectively.

The growth in urea usage as a forest fertilizer in B.C. has been very dramatic. In 1978, only 2,800 tonnes were applied while 11,800 tonnes are being applied this year. Further increases in the future

(mainly from private industry) can be expected as a consequence of the new Forest Act which provides cost reimbursements to companies engaging in forest fertilization.

Current application rates of urea to Douglas Fir are as follows:

Stands under 30 years:	365 Kg/hectare	(325 lbs/acre)
Stands over 30 years:	488 Kg/hectare	(435 lbs/acre)

The product is purchased in bulk form and is therefore made available at a very reasonable price. Current prices are $176/tonne, F.O.B. Vancouver Island (most of the fertilization is undertaken here due to presence of privately owned forest lands).

Demand for urea is seasonal because results obtained are dependent upon the weather. In B.C., it is generally applied during the two months of October and November because adequate rainfall is required after treatment. Further north, urea may be applied as early as mid-September to avoid the problem of snow cover.

There is one supplier of forestry-grade urea to the B.C. market: Cominco, from their Calgary plant.

Transportation and storage problems are evident in B.C. Transportaton is a problem because most of the users want their product at the same time. It is

railed from Calgary and rail car availability for fertilizer shipmemts becomes a problem. Users are currently considering spring applications to smooth out the peaks in demand. Storage of the product is not undertaken by the users. Instead, the product is received by the firm which applies it (Conair Aviation), it is packaged into bags and then used immediately. Year-round storage would be too costly to be an economically feasible proposition.

There are no limitations on supply of forestry-grade urea to B.C. users.

3.2 Region III

The use of urea as a forest fertilizer in Region III is mainly constrained to the United States. Only two areas in the United States fertilize forests on a significant scale; these are the Southeast and the Pacific Northwest. We have restricted our research to the Pacific Northwest since it is highly unlikely a Peace River plant could economically service the American Southeast. Virtually all of the forest fertilization in the Pacific Northwest is done in Washington and Oregon.

Current use of urea as a forest fertilizer in the Pacific Northwest is difficult to estimate in the absence of published data, however, telephone correspondence with key individuals elicited some

useful information. Over 140,000 hectares (350,000 acrse) is to be fertilized in 1979 resulting in demand for urea in the area of 68,950 tonnes. This is not entirely forest-grade urea; some organizations still apply granular urea, although the trend is toward total use of forestry-grade product. Weyerhauser is the largest single user, fertilizing some 45,000 hectares (110,000 acres) requiring 21,770 tonnes of urea.

Application of nitrogen-based fertilizers to forests in the Pacific Northwest has grown rapidly in the last decade. In 1969, only 8,000 hectares (20,000 acres) has been fertilized while over 600,000 hectares (1.5 million acres) will have been fertilized by 1979. In a recent publication (and confirmed by telephone communication), Dr. G.W. Bengston of Oregon State University predicted that 200,000 hectares (500,000 acres) will be fertilized annually in the decade 1980-1990 in the United States Pacific Northwest. This would result in annual demand for urea for forestry purposes amounting to nearly 99,790 tonnes. Urea is applied at 1488 kg/hectare (435 lbs/acre).

Demand for urea for forestry purposes is seasonal. Again, the time for urea applicaton is determined by frequency of rainfall. The following recommendations for season of application were made in a paper delivered by Heilman et al at the recent forest Fertilization Conference in Union, Washington:

Region	Season of Application
Coastal Area	late January to mid-April
Pudget Sound Lowlands	late October to beginning of March
West Cascades	mid-October to beginning of April
Rain Shadow Area of North Pudget Sound	November and December
East of the Cascades	October and November

There are no producers of urea located in the Pacific Northwest. Granular urea is shipped down the west coast from the Collier plants in Alaska; a limited quantity of urea is also supplied from California producers. All of the forestry-grade urea used is purchased from the Cominco plant in Calgary.

The users of urea as forest fertilizer indicate a trend towards total use of forestry-grade urea. Concern has been voiced over the unfavourable situation of having a Canadian firm in a monopoly position over the supply of forestry-grade urea. Collier of Alaska apparently has no intention of producing the specialized product. More competition, Canadian or American, would be welcomed by the current users.

4.0 INDUSTRIAL DEMAND

Industrial users of ammonia account for 20-25 percent of total Canadian and U.S. demand for ammonia, according to a number of recent studies of those markets.

The types of industrial users include the following:

- explosives for use in mining, highway construction, etc.;
- synthetic and organic chemicals production;
- metal processing;
- production of "cooking acid" for the sulphite pulp process and nutrification of water treatment lagoons by the pulp and paper industry.

The industrial demand for ammonia in British Columbia is very likely below the national average and probably ranges between 10-15 percent of total ammonia-derived demand. There are very little (if any) industrial uses in British Columbia for production of synthetic and organic chemicals and metal processing.

There are about 227,000 tonnes of explosive-grade ammonium nitrate annually produced by Alberta plants for shipment to North American and offshore markets. British Columbia's share of this production is small (i.e. less than 10%). Producing plants of explosive-grade ammonium nitrate include:

CIL	545 - 635 tonnes/day
Cominco	90 tonnes/day
Esso	45 tonnes/day.

The pulp and paper industry uses ammonia for "cooking acid" and water treatment. In 1977, the industry used 42,149 tonnes (Statistics Canada 36-204). British Columbia's portion of this demand is estimated at about 50 percent. Demand for ammonia in this sector is declining, however, as output of sulphite pulp is projected to decline.

5.0 OFFSHORE DEMAND

Considerable international trade in nitrogen fertilizers is presently conducted. Most of the nitrogen fertilizer traded is in the form of derivatives of ammonia, such as ammonium sulphate, ammonium nitrate and urea. Presumably, this is due to the wider applicability and greater transportability of the derivative products.

World trade statistics are only available up to the fertilizer year ending June 30, 1977, however, they point out that a number of countries rely very heavily on foreign sources for their supply of nitrogen fertilizer. The United States was the largest importer of nitrogen fertilizers in the year ending June 30, 1977, importing over 1.6 million tonnes of

actual N in nitrogen fertilizer. The eastern Asian market also appears to be very reliant on imports. China and India both imported over 750,000 tonnes of actual N.

Japan has historically been very involved in the nitrogen fertilizer export market, particularly to other eastern Asian countries. However, a combination of the appreciating value of the yen and rising world petroleum prices which are driving up the price of naptha (used as a feedstock in ammonia production in Japan) have seriously eroded Japan's competitive position. In response, the Japanese Ministry of International Trade and Industry has instructed the producers of chemical fertilizers and fertilizer materials to form a capacity reduction cartel. The plans call for a reduction of urea, ammonia and wet phosphatic acid production capacity in response to existing excess capacity (note: Japanese exports of nitrogen fertilizer have decreased from over 1.4 million tonnes of N in the year ending June 30, 1975 to 742,000 tonnes of N in the year ending June 30, 1977. Over the same period, urea exports in terms of N declined from over 1.1 million tonnes to 325,000 tonnes). The Ministry of International Trade and Industry has recommended discarding 26.1% of existing ammonia production capacity and 44.9% of existing urea production capacity, by mid-1979.

Due to the lack of published statistical data, the impact of these capacity reductions on the international market is unknown. It is known that Japan has been importing urea from the Collier plants at Kenai, Alaska. However, the international market would need a very thorough investigation to assess the impacts of Japan's capacity reduction, expected continuing appreciation of the yen, expected rising world prices for petroleum (and hence its derivatives) and the competitive position of a Canadian plant with lower prices for feedstock and low exchange rates.

6.0 CONCLUSIONS

- Total demand for anhydrous ammonia in Region I and Region II is equivalent to 32 tonnes per day production in 1980, increasing to 140 tonnes per day by 1990.

- It would appear very difficult for the proposed ammonia plant to compete in the export market with Alberta and Alaskan plants given transportation impediments.

- Should a 90 tonne/day ammonia plant (approximately) prove to be uneconomic (see Phase II and III findings below) consideration could be given to urea production (i.e. forestry sector) and to greater marketing intelligence (i.e. direct field investigation) for the export sector.

IV ENGINEERING-ECONOMIC ANALYSIS (Phases II and III)

1.0 INTRODUCTION

All study components of Phase II (Industry Efficiency Analysis) and Phase III (Economic Analysis Proposed Plant) have been initiated and it is estimated that these study phases are about 40% complete to date.

Some of the transportation and pricing issues have been dealt with in Phase I above. Associated-Pullman Kellogg Ltd. (APK) have undertaken a costing analysis for ammonia production and D.W. Ross & Associates Ltd. have undertaken an examination of natural gas supply and pricing.

2.0 ANHYDROUS AMMONIA PLANT COSTING AND FEEDSTOCK ANALYSIS

This section of the study considers both the engineering-economics of anhydrous ammonia production for a range of plant sizes in western Canada, as well as the cost and availability of natural gas, the plant's feedstock.

2.1 Anhydrous Ammonia Plant Costing Analysis

Associated-Pullman Kellogg undertook the evaluation of anhydrous ammonia production costs. Their analysis was comparative in that production costs for typical Alberta plants were developed and contrasted with a

potential plant in north-east British Columbia. Various plant sizes were addressed in the comparative analysis. In the case of Alberta, three plant sizes were selected (i.e. 545, 910 and 1,360 tonnes/day name plate capacity) to provide typical examples of small to world-scale plants currently operating in the province. For north-east British Columbia, plant sizes of 90, 180 and 545 tonnes per day capacity were selected, based on the market analysis findings and to provide overlap with the Alberta case examples.

As can be observed in the following exhibits, there are substantial economies of scale in ammonia production. For the British Columbia plants, the cost per tonne of ammonia is reduced significantly from $374.53 to $213.60 when the plant size is increased from 90 tonnes per day to 545 tonnes per day. The main reason for the cost reduction concerns the capital investment required; production increases six-fold but capital cost increases less than three-fold. Even at 545 tonnes per day, however, the cost per tonne of ammonia ($213.60) is well in excess of production costs of existing ammonia plants based in Alberta.

Production costs also vary between British Columbia and Alberta for plants of similar scale. Notice that a 545 tonne per day plant in B.C. produces ammonia at a cost some $12.74 higher than the identical plant in Alberta. The reason is the price of natural gas (as both feedstock and fuel) is assumed to be higher in

B.C. by some 1.2 cents per m^3. The sensitivity of production economics to increases in the price of natural gas is very apparent.

Ammonia production costs for an Alberta-based plant vary from $161.40 (1,360 tonnes/day) to $200.86 (545 tonnes/day). The average selling price of ammonia F.O.B. plant in Alberta is reportedly $165.00 per tonne.

Ammonia production costs for a British Columbia-based plant vary from $213.60 (545 tonnes/day) to $374.53 (90 tonnes/day), assuming natural gas is purchased at 5.7 cents per m^3. The results indicate that a plant scaled below 545 tonnes/day is uneconomic, transportation cost savings notwithstanding.

PEACE-LIARD REGION
AMMONIA PLANT STUDY
TABLE 1

TYPICAL SCALE ALBERTA BASED PLANTS

PRODUCTION	545	910	1,360
Tonnes/day			
Tonnes/year (Note 1)	188,025	313,950	469,200
Investment ($Cdn 1979)			
Total Fixed Investment including onsites, offsites, storage and 15% contingency	$68,000,000	$92,000,000	$129,000,000 (Note 4)
PRODUCTION COSTS	$/Tonne	$/Tonne	$/Tonne
Feedstock & Fuel (Note 2)	55.47	54.32	51.39
Electricity, Kwh @ $0.017/Kwh	0.47	0.41	0.37
Cooling water makeup	1.05	1.05	1.05
Boiler Feed water makeup	1.10	1.10	1.10
Steam	-	-	-
Catalyst & Chemicals	1.65	1.65	1.65
	59.74	58.53	55.56
Labour, 5 men/shift @ $8/hour	1.76	1.06	0.71
Labour & Plant Overhead @ 100% of Labour	1.76	1.06	0.71
Indirect Charges (Note 3) @ 18% of fixed investment per year	65.18	52.91	49.46
TOTAL PRODUCTION COST	128.44	113.56	106.44
Pretax Rate @ 20% of fixed investment/year	72.42	58.79	54.96
COST/TONNE OF AMMONIA F.O.B. PLANT	200.86	172.35	161.40

PEACE-LIARD REGION
AMMONIA PLANT STUDY
TABLE 2

POTENTIAL NORTH-EAST B.C. BASED PLANTS

PRODUCTION	90	180	545
Tonnes/day			
Tonnes/year (Note 1)	31,050	62,100	188,025
Investment ($Cdn 1979)			
Total Fixed Investment including onsites, offsites, storage and 15% contingency	$23,000,000	$36,000,000	$68,000,000 (Note 4)
PRODUCTION COSTS	$/Tonne	$/Tonne	$/Tonne
Feedstock & Fuel (Note 2)	60.19	59.18	68.21
Electricity, Kwh @ $0.017/Kwh	11.24	11.24	0.47
Cooling water makeup	0.61	0.51	1.05
Boiler Feed water makeup	1.32	1.32	1.10
Steam	(0.53)	(0.53)	-
Catalyst & Chemicals	1.29	1.29	1.65
	74.12	73.11	72.48
Labour, 5 men/shift @ $8/hour	10.58	5.29	1.76
Labour & Plant Overhead @ 100% of Labour	10.58	5.29	1.76
Indirect Charges (Note 3) @ 18% of fixed investment per year	132.28	103.52	65.18
TOTAL PRODUCTION COST	227.56	187.21	141.18
Pretax Rate @ 20% of fixed investment/year	146.97	115.02	72.42
COST/TONNE OF AMMONIA F.O.B. PLANT	374.53	302.23	213.60

NOTES

(1) All plants operate for 345 days/year.

(2) Natural gas assumed is

1000 Btu (HHV)/SCF

880 Btu (LHV)/SCF

(3) Indirect charges are:

Depreciation	10%
Maintenance (labour & materials)	4%
Insurance	2%
General Administration	2%
	18% of Total Fixed Investment/year.

(4) No increment allowed for increased construction costs in N.E. B.C.

(5) Total fixed investment must be reduced to $6,000,000 to lower the F.O.B. plant cost to $165/tonne.

(6) All plants are based on conventional, commercially proven ammonia technology.

2.2 Natural Gas Supply and Cost

D.W. Ross & Associates Ltd. have investigated natural gas supply and pricing issues and tenders the following findings:

The natural gas requirement for a 180 tonne/day plant of some 7,000 Mcf/day or approximately 70.8 million m^3/year (2.5 Bcf/year) would not be a serious supply problem in the areas under consideration. From discussions with senior officials at the B.C. Petroleum Corporation and B.C. Energy Commission, it might well be that certain financial assistance would be considered by B.C. in order to connect up such a major new industrial load.

The most representative large volume industrial rates currently applicable in the region are categories #11 and #12 of Inland Natural Gas:

Schedule 11

- Large volume firm service

  November 1st - March 1st: 5.2¢/m^3 ($1.47/Mcf)
  March 1st - November 1st: 5.0¢/m^3 ($1.42/Mcf)

  Under Schedule 11, minimum volume is 28,262 m^3/day, but contract demand is negotiable.

Schedule 12

- Large volume interruptible service

  November 1st - March 1st: 4.8¢/m^3 ($1.36/Mcf)
  March 1st - November 1st: 4.6¢/m^3 ($1.31/Mcf)

It should be noted that pulp and paper mills in the Prince George region are having to pay considerably more (approximately 7.1¢/m^3 or $2.00/Mcf) for natural gas.

Future prices for 1980, however, in the region will have to take account of the following:

a) the recent N.E.B. major award to Westcoast Transmission Company on cost of service and associated costs;

b) a forecast major increase in the net price of natural gas paid to B.C. producers.

These factors are estimated to add between 1.9¢ and 2.6¢/m^3 (55¢ and 75¢/Mcf) to the wholesale costs of gas to B.C. utilities (provided the B.C. Government does not choose to absorb some portion of the increase through reduced net revenues to the B.C. Petroleum Corporation).

The best estimates for a large new industrial consumer in the northeast B.C. region in 1980 would be in the following ranges:

<u>For Firm Gas</u>:

Inland Natural Gas area	7.4-7.6¢/m^3	($2.10-2.15/Mcf)
Dawson Creek or Fort St. John	6.9-7.6¢/m^3	($1.95-2.00/Mcf)

For Interruptible Gas:

Inland Natural Gas area	6.5-7.3¢/m^3	($1.95-2.05/Mcf)
Dawson Creek or Fort St. John	6.4-7.2¢/m^3	($1.80-1.90/Mcf)

For a similar plant in the adjoining Grande Prairie area of Alberta, the projected 1980 gas rates would be similar with one notable exception. The Alberta Government has announced some commitment to "incentive" natural gas rates to help promote new industries; the B.C. Government is opposed to direct gas price incentives. We would caution against assuming any subsidy on gas prices for this plant, however, even in Alberta, because of its competing directly with existing large scale ammonia plants in the province.

V CONCLUSIONS

1) The Market Analysis points up that a "small" scale ammonia plant (e.g. 90 tonnes/day) can only be considered in terms of anhydrous ammonia sales to Regions I and II. The Engineering/Economic Analysis indicates that an ammonia plant of 545 tonnes/day approximates the smallest plant scale while maintaining competitive production costs.

2) These findings indicate that a single-purpose small scale plant producing anhydrous ammonia in the Peace River Region is not a viable proposition.

3) The derivative production of urea has some merit, particularly in relation to the forestry sector and the export market. It should be borne in mind, however, that about 272,000 tonnes of urea would be produced annually from 455 tonnes/day ammonia feedstock - a very large quantity indeed to market (i.e. the total forestry demand for urea fertilizer is about 90,000-100,000 tonnes per year; British Columbia's 1978 demand for urea in agriculture was only about 13,600 tonnes).

APPENDIX A

STUDY TERMS OF REFERENCE

TERMS OF REFERENCE OF A STUDY FOR A PROPOSED ANHYDROUS AMMONIA PLANT

I. STUDY OBJECTIVE

To determine the potential of establishing a major anhydrous ammonia plant in the general area of the British Columbia Peace River group of communities (Fort St. John, Taylor, Chetwynd and Dawson Creek).

The study will define the current and projected market areas for anhydrous ammonia from a plant located within the region; establish current and projected production costs for the plant and for potential competitive plants, and thus recommend the size of a proposed manufacturing facility and its long-term commercial viability.

The plant would utilize natural gas as a feedstock and depend upon either hydro electricity and/or natural gas as a motive power. Transportation modes would be highway carriers for regional distribution and the railway for export and Southern British Columbia markets.

II. BACKGROUND

The Economic Development Commission of the Peace River-Liard Regional District of British Columbia cognizant of the increasing demands for fertilizers within the agricultural-industrial sectors of British Columbia;

- and being aware that there is no major manufacturing-producers of ammonia based types of fertilizers presently within the province;
- and realizing that the province is capable of competitively providing the basic feedstock of natural gas, hydro electricity for motive power, and that there exists an adequate network of highways and truck carriers, together with a provincial railroad system which can provide alternative services to tide-water ports for export and to inter-change rail points to the U.S.A.;

therefore, the Economic Development Commission has requested under the Research Program of the Canada-British Columbia Industrial Development Subsidiary Agreement that cash grant funding be provided to undertake a market and feasibility study for a liquid anhydrous ammonia plant to be located in the Peace River region of British Columbia.

The study is to be funded jointly by the Federal Department of Regional Economic Expansion and the British Columbia Ministry of Economic Development under the Industrial Development Subsidiary Agreement.

III. SCOPE OF THE STUDY

The study will include a thorough market research of the elements relative to the establishment of an efficient and viable ammonia operation which will include the following:

1. (a) Identify the extent of local market areas and the quantity of ammonia presently consumed for agricultural and industrial use in the following regional sectors:

   (i) Northeastern British Columbia and Northwest Alberta (specifically Census District #15 - Alberta)

   (ii) Central and Southern British Columbia

   (iii) Potential export regions in the U.S.A. and Pacific Rim Countries - include historic trends of exports/imports by volume and price.

(b) Identify historic sources and forms of ammonia used in (i) and (ii) above, that is, liquid form such as UAN solutions and UREA; source of supply, volume, price at source, and price in market place.

(c) Review the current commercial fertilizer producers in the local market areas, indicating the types of products produced for use in the agricultural sector.

2. (a) Project growth in demand for the market areas in (i) and (ii) above, and (iii) above if possible.

(b) Review past trends of intensity of fertilizer application and project the potential demand for ammonia in (i) and (ii) above through to at least 1990.

(c) Project trends toward use and potential of other forms of nitrogen in (i) and (ii) above through to at least 1990.

(d) For (i) and (ii) above, assess the rate of growth in the acreage brought under cultivation and project the potential of agricultural acreage to be developed through to at least 1990.

3. (a) Analyze, estimate and project the cost of transporting ammonia to significant markets, that is, (i), (ii) and (iii) above.

   (b) Indicate costs as a function of distance and the transportation mode most suitable to market areas (i), (ii) and (iii) above.

   (c) Consider transportation costs relative to the competitive use of:

      (1) Rent for hire highway carriers;

      (2) Leased company operated highway carriers;

      (3) Railroad car lot; and

      (4) Feasibility/viability of using pipelines to market areas in (i), (ii) and continental North America.

   (d) Estimate the cost of transporting ammonia to (i), (ii) and (iii) above from nearest existing producers.

4. Determine current ammonia prices in the nearest producing and consuming areas. The actual prices being paid for ammonia should be established and compared to the producing costs and rate of return of existing competing plants.

5. Estimate the current and projected ammonia production costs for the nearest producers. Costs should be estimated based both on variable operating costs and on the achievement of a normal rate of return for the existing producers. Note any impact of government incentives (accelerated depreciation, investment tax credits, etc.). Indicate the various cost elements to be included. The minimum price likely to be charged by competition should be estimated. Escalation of utility rates should be reviewed with local utility suppliers, and estimates of inflation rates (as they may affect material supplies) are needed.

6. Review the potential for reduced production costs through technological improvements. The study should cover the situation of existing plants able to retrofit cost-cutting techniques or technologies, as well as potential developments which might be incorporated into new plants to make them important competitors in the future. The capital cost for new technologies should be estimated, including appropriate allowance for inflation of equipment and construction costs.

7. Review regulations pertaining to the cost and availability of natural gas. Particularly important could be regulations relating to natural gas exports (quantities allowed and price levels), which may affect the profitability of the proposed plant, as well as competitors' plants.

8. Project ammonia prices in the region from potential competition, based on long-term requirements for a normal profit, inflation rates, and anticipated supply-demand balances. This is essentially shown by an aggregation of data developed in prior sections, with modifications in light of the probable supply-demand situation.

9. Estimate the manufacturing costs for ammonia from the proposed plant. This should include all expense elements for plants of various sizes, and also for a used/reconditioned plant if appropriate. For this calculation, various capital cost estimates are also required. Plant sizes should be selected, taking into account the local requirements in (i) and (ii) above and the broader marketing areas in (iii) above. The impact of goverment incentives must be included, particularly where special incentives for industrial development are offered.

10. Estimate the "price stream" which rises at the inflation rate and provides a normal rate of return on various plant sizes. The results of this calculation should be compared with the results from item 8.

11. Estimate the lifetime rate of return and profits on the proposed ammonia plant based on projected prices (item 8). The long-term profitability of the proposed plant must be determined, and cashflow estimates made for the period from project initiation through to 1990 at least. The annual profits should be calculated.

12. Estimate the sensitivity of plant economics to key factors. Key factors will include, for example, ammonia prices, natural gas prices and dependence on local markets as against distant markets.

13. Review possible effects on project economics of producing a variety of ammonia-based fertilizers on site. Further processing options should be considered, including UREA and UAN solutions, for example.

14. Review strategic planning aspects. These could include the potential for joint ventures with existing or potential ammonia producers, owners of fertilizer distribution systems, etc. Any factors which might have impact on the economics of the proposed plant should be covered, even if a detailed study is not performed at this stage, or the alternates do not appear particularly relevant at this time (e.g., imported ammonia from eastern Canada, Alaska, etc.).

15. The study emphasis will be weighted heavily towards the local and regional development potential. It will be sufficient, in the review of the export markets of the U.S.A. and Pacific Rim Countries, and in the review of the projected growth rates and transportation costs for those export markets (in items 1, 2 and 3) to quote accurate existing statistics.

16. Assess the long-term commercial viability of the project and develop final recommendations. This is clearly the concluding section of the study. Recommendations for further work could include detailed technical/engineering studies, detailed enginering design, etc. These elements are not considered as part of the initial market research study.

IV. COST OF THE STUDY

It is anticipated that the cost of the proposed study will be in the range of $50,000.

V. PROPOSALS FROM CONSULTANTS

Consultant proposals should include a detailed methodology for conducting the market study, the approach and scope envisaged, the identification of project team members and their respective responsibilities and qualifications, the relevant experience of their firm, a proposed scheduling of work activities and a detailed cost estimate by activity and project member.

VI. REPORT AND WORKING PAPERS

Three (3) copies of a draft report are to be presented to the Co-ordinator, within 4 months from the date of authorization to proceed, for review by the Technical Sub-Committee of the IDSA Research Program, prior to the printing of the final report. Twenty (20) copies of the final report will be required, and the final report and all the working papers

will become the property of the Co-ordinator, the provincial Minister of Economic Development and the Government of Canada upon completion of the study.

VII. LIAISON

William Anderson, Economic Development Commissioner for the Peace River-Liard Regional District, will be the study Co-ordinator, and the successful Consultant will be expected to liaise with William Anderson at strategic points in the study schedule.

20.06.79

APPENDIX B

SELECTED STATISTICAL TABLES

TABLE OF CONTENTS

APPENDIX B

	Page
SELECTED STATISTICAL TABLES	
1.0 PEACE RIVER, B.C. AND CANADIAN AMMONIA/FERTILIZER STATISTICS	
Anhydrous Ammonia and Its Derivatives - Imports and Exports	1 - 3
Fertilizer Demands	4 - 8
Calculations of Nitrogen Sales	9 - 10
Crop Production	11 - 12
Shipments to Domestic and Export Markets	13 - 16
Industrial Capacities	17 - 19
2.0 MOUNTAIN AND PACIFIC UNITED STATES AMMONIA/FERTILIZER STATISTICS	
Mountain and Pacific States	20 - 34
3.0 WORLD PRODUCTION, TRADE AND CONSUMPTION STATISTICS FOR AMMONIZ AND NITROGENOUS FERTILIZERS	
World Ammonia Production and Trade Statistics FAO, 1978	35 - 39
World Nitrogenous Fertilizers Production Trade and Consumption Statistics FAO, 1978	40 - 54

PART 1.0: PEACE RIVER, B.C. AND CANADIAN AMMONIA/FERTILIZER STATISTICS

ANHYDROUS AMMONIA AND PRODUCTS
IMPORTS/EXPORTS - B.C.
1976 - 1978 in Cwt.

		Imports				Exports			
		1976	1977	1978	Total	1976	1977	1978	Total
40201	Ammonia Anhydrous					85,442	312,026	527,617	925,085
41631	Urea	583,128				859,198	3,166,473	4,191,964	8,217,635
41644	Ammonium Nitrate					712,664	830,575	15,444	1,558,683
41647	Nitrogen-Phosphate Fertilizers n.e.s.					5,647,365	6,745,873	5,841,468	18,234,706
41649	Nitrogenous Fertilizers n.e.s.	20,217		11,696		-	-	-	-
41648	Ammonium Sulphate					3,479,283	3,074,150	2,910,253	9,463,686
	TOTAL	603,345		11,696		10,783,952	14,129,097	13,486,746	38,399,795

Source: B.C. External Trade Report.

ANHYDROUS AMMONIA AND PRODUCTS: EXPORTS - CANADA

1970 - 1978 in Cwt.

		1970	1971	1972	1973	1974	1975	1976	1977	1978	Total
40201	Ammonia Anhydrous	3,500,742	3,163,867	1,718,161	1,415,321	2,111,699	2,557,045	4,988,143	12,649,377	10,602,719	42,707,074
41199	Nitrogen Function Compounds n.e.s.	881,040	708,040	357,850	351,325	334,064	245,884	307,114	299,314	360,152	3,844,783
41631	Urea	5,276,232	3,334,296	4,671,948	3,401,704	3,231,683	2,668,576	4,020,974	11,899,849	16,021,337	54,526,599
41644	Ammonium Nitrate	6,450,937	7,336,496	7,547,208	6,551,488	4,893,815	3,580,255	4,165,121	5,810,799	7,254,584	53,590,703
41645	Nitrogen Solutions	2,475,069	2,060,650	2,183,565	2,172,622	2,212,073	2,018,171	1,850,379	1,512,502	1,284,245	17,769,276
41647	Nitrogen-Phosphate Fertilizers n.e.s.	12,076,614	14,125,775	14,079,486	13,584,585	12,784,251	9,895,321	10,354,489	11,293,325	10,425,364	108,619,210
41648	Ammonium Sulphate	3,971,311	3,427,957	4,000,050	4,894,237	2,888,438	2,801,422	4,037,740	3,942,126	3,746,310	33,709,591
	TOTAL	34,631,945	34,157,081	34,558,268	32,371,282	28,456,023	23,766,674	29,723,960	47,407,292	49,694,711	314,767,236

Source: Statistics Canada 65-202

CANADA - IMPORTS BY COMMODITY 1970 - 1978

		1970	1971	1972	1973	1974	1975	1976	1977	1978	Total
40202	Ammonia	163,809	196,966	89,206	350,413	419,377	134,759	483,115	539,985	1,210,754	3,588,384
41631	Urea	76,284	303,205	152,507	155,914	9,557	479,099	1,012,996	1,290,045	1,740,997	5,220,604
41639	Nitrogen Solutions	20,188	9,619	35,344	5,864	1,650	31,392	608,717	124,028	69,163	905,965
41648	Ammonium Sulphate	813,926	866,700	843,008	726,462	800,108	869,119	875,753	431,103	388,446	6,614,625
41649	Nitrogenious Fertilizers n.e.s.	118,702	110,956	56,337	141,152	200,813	272,832	480,869	149,463	566,887	2,098,011
41658	Phosphatic Fertilizers n.e.s.	1,172,071	1,006,684	1,233,183	823,678	1,348,099	1,814,886	3,105,586	3,902,186	5,204,520	19,610,893
	TOTAL	2,364,980	2,494,130	2,409,585	2,203,483	2,779,604	3,602,087	6,567,036	6,436,810	9,180,767	38,038,482

Source: Statistics Canada 65-203

FERTILIZER DEMAND PEACE RIVER REGION (ALBERTA AND BRITISH COLUMBIA)

1980 to 1990 (Preliminary)

REGION	TOTAL NITROGENOUS FERTILIZER DEMAND AS N (short tons)	
	1980	1990
Alberta	44,554	83,648
British Columbia	12,575	26,028
TOTAL:-	57,129	109,676

ESTIMATED NITROGEN REQUIREMENTS FOR FARMING IN THE B.C. PEACE RIVER DISTRICT - 1980

(Preliminary Estimates)

CROP	ACRES (000's)	% ACRES FERTILIZED	LBS N PER ACRE	TOTAL N (short tons)
Cereal Grains (wheat, oats, barley, rye)	305	80	50	6,100
Oilseeds (rapeseed, flaxseed)	203	80	65	5,278
Forage Seed	45	80	40	720
Other (Misc.) Cash Crop	9	80	30	108
Sub-Total Crop:	562			12,206
Forages	180	10	35	315
Summer Fallow	185	-	-	-
New Breaking	18	20	30	54
TOTAL:-	945			12,575
Total Tons A/A Equiv.:				15,335

ESTIMATES OF NITROGENOUS FERTILIZER DEMANDS FOR PEACE RIVER DISTRICT OF B.C. - 1990

CROP	ACRES[1/] (000's)	% ACRES FERTILIZED[2/]	LBS N PER ACRE[3/]	TOTAL N (short tons)
Creal Grains	348	90	80	12,528
Oilseeds	231	90	100	10,395
Forage Seed	63	90	60	1,701
Other Cash Crop	10	90	40	180
Sub-Total:	652			24,804
Forages	234	50	50	1,170
Summer Fallow	221	-	-	-
New Breaking	18	30	30	54
TOTAL:	1,125			26,028
Total Tons A/A Equiv.:				31,741

1/ 180,000 acres of new breaking over 10 years allocated as summer fallow 20%; half the balance to forage and forage seed in ratio of 3:1, the other half to cash crops in proportion to their 1980 allocation.

2/ 10% increase in number of acres fertilized (cash crops and forage).

3/ Based on potential doubling of N fertilizer rates in cash crops and increase at 50% on tonages and new breaking.

ESTIMATED NITROGEN FERTILIZER REQUIREMENTS FOR FARMING IN PEACE RIVER DISTRICT ALBERTA 1980

(Preliminary Estimates)

CROP	ACRES (000's)	% FERTILIZER	LBS N PER ACRE 1/	TOTAL N (short tons)
Cereal Grains	1,253	80	55	27,566
Oilseeds	665	80	60	15,960
Misc. Cash Crop	3	80	40	48
Sub-Total:	1,921			43,574
Forage	500	10	35	375
Summer Fallow	1,000	-	-	-
New Breaking	35	20	30	105
TOTAL:-	3,468			44,554
Total Tons A/A Equiv.:				54,334

1/ Does not include small amounts of N included in fertilizer applied to seed which is mostly 11-48-0.

ESTIMATES OF NITROGEN FERTILIZER REQUIREMENTS FOR FARMING PEACE RIVER ALBERTA, 1990

(Preliminary Estimates)

CROP	ACRES (000's)	% FERTILIZER	LBS PER PER ACRE	TOTAL N (short tons)
Cereal Grains	1,332	90	80	47,952
Oilseeds	707	90	100	31,815
Misc. Cash Crop	16	90	80	576
Sub-Total:	2,055			80,343
Forage	640	20	50	3,200
Summer Fallow	1,088	-	-	-
New Breaking	35	20	30	105
TOTAL:-	3,818			83,648
Total Tons A/A Equiv.:				102,000

CALCULATION OF NITROGEN SALES
BRITISH COLUMBIA 1978/79

Fertilizer		Amount Sold[1/] (short tons)	% N	Tons of N
Anhydrous		1,248	82	1,023
Nitrate		20,923	34	7,113
Urea		9,158	46	4,213
Sulphate		1,801	21	378
ANP	1:1	2,483	23	571
	2:1	1,262	27	340
	Other	12	Say 30	4
Urea Phosphate	1:1 (23:23)	585	23	134
	2:1 (27:14)	199	27	54
	Other	20	Say 30	6
Ammon. Phos.	11:48	4,144	11	455
	11:55	3,126	11	344
	16:20	7,455	16	1,193
	18:46	674	18	121
	Other	3,619	Say 20	724
Mixed Fertilizer	Solid	36,932	Say 12	4,431
TOTAL ALL FERTILIZERS CONTAINING N:-				21,107

1/ Source: Western Canada Fertilizer Association - Retail Sales Report 1978/79, August 27, 1979.

B.C. Peace River 1980 Estimate:- 12,575 (60%?)

CALCULATION OF N SALES
ALBERTA 1978/79

Fertilizer		Amount Sold (short tons)	% N	Tons of N
Anhydrous		142,713	82	117,024
Nitrate		109,201	34	37,128
Urea		128,899	46	59,294
Sulphate		24,914	21	5,232
ANP	23	41,814	23	9,617
	27	12,201	27	3,294
	Other	258	Say 30	77
Urea Phosphate	23	5,351	23	1,230
	27	1,626	27	439
	Other	200	Say 30	60
Ammon. Phos.	11:48	108,433	11	11,928
	11:55	79,575	11	8,753
	16:20	25,408	16	4,065
	18:46	7,409	18	1,334
	Other	53,574	Say 20	10,715
Mixed		13,026	10	1,303
Nitrogen Solution	Uran.	24,073	28	6,740
TOTAL:-				278,235
Peace River Alberta Estimates 1980:				44,554 (16%)

SUMMARY CEREAL, OILSEED AND FORAGE PRODUCTION
B.C. PEACE RIVER REGION 1976, 1977 and 1978

CROP	ACREAGE						
	1976	1977	1978	1979	1980	1990	2000
Wheat	71,528	62,879	53,148	75,000	90,000		
Oats	87,088	68,703	51,295	50,000	50,000		
Barley	211,681	157,102	134,640	125,000	150,000		
Rapeseed	39,798	85,337	178,771	300,000	200,000		
Rye	5,763	2,421	8,302	10,000	15,000		
Flax	2,963	1,218	849	2,500	3,000		
Misc.	1,593	7,288	9,341	9,300	9,300		
Sub-Total:	420,414	384,948	436,346	571,800	517,300		
Total Forage Seed	36,200	36,950	34,900	40,000	45,000		
Other Forage	151,093	189,642	191,500	191,000	180,000		
Total:	607,707	611,540	662,746	802,800	742,300		
Summer Fallow	201,592	263,767	229,047	106,200	184,700		
New Breaking	20,984	16,769	18,058	18,000	18,000		
TOTAL CULT.:	827,127	892,076	909,851	927,000	945,000	1,125,000	1,305,000

ACRES OF CROPS: PEACE RIVER ALBERTA

CROP	1976	1977	1978	1979	1980	1990[1/]	2000
Wheat	367,374	272,013	294,426		300,000	319,000	
Oats	176,552	114,641	107,697		100,000	106,000	
Barley	1,228,525	884,478	887,030		850,000	904,000	
Rapeseed	331,392	474,723	850,677		650,000	691,000	
Rye	3,806	1,316	3,291		3,000	3,000	
Flax	15,839	16,514	9,800		15,000	16,000	
Misc. Cash	14,815	17,556	15,533		15,000	16,000	
Sub-Total:	2,138,303	1,781,241	2,168,454		1,933,000	2,055,000	
Forage	537,138	510,288	408,299		500,000	640,000	
Summer Fallow	885,086	1,218,876	1,004,648		1,000,000	1,088,000	
New Breaking	45,398	37,122	45,714	35,000	35,000	35,000	
TOTAL:	3,605,925	3,547,527	3,627,115		3,468,000	3,818,000	

1/ 350,000 new acres: 25% fallow, balance to forage and cash crops equally; cash distribution in same pph as 1980.

****CANADIAN FERTILIZER INFORMATION SYSTEM****

DATE AUG 21,1979

FERTILIZER MATERIALS

SHIPMENTS TO DOMESTIC AND EXPORT MARKETS

FROM JUL 1978 TO JUN 1979

FERTILIZER MATERIAL	DOMESTIC ATL PROV	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL CANADA	EXPORT USA	OFFSHORE	TOTAL SHIPMENTS
UREA	1490	7842	40870	109689	85764	124442	15185	385282	293689	1	678972
AMMONIUM SULPHATE				9670	9136	24498	3867	47171	185685		232856
AMMONIUM NITRATE	28936	55292	100659	94600	93535	127955	23382	524359	108738	11811	644908
ANHYDROUS AMMONIA		3198	27248	74669	45627	147008	2209	299959	107393		407352
NITROGEN SOLUTION		23224	56085	24130	5031	28225		136695	63725		200420
AMMONIUM NITRATE PHOS 23-23			120	11819	27763	27700	1260	68662	58		68720
AMMONIUM NITRATE PHOS 27-14			6	3789	1630	5058	404	10887	329		11216
AMMONIUM NITRATE PHOSPHATE			76	26736	40836	30458	1985	100091	808		100899
AMMONIUM PHOSPHATE 11-48			271	38987	81955	111588	3922	236723	22881		259604
AMMONIUM PHOSPHATE 11-55			126	55846	57353	81516	7835	202676	96420		299096
AMMONIUM PHOSPHATE 16-20			17	5184	17343	27348	11391	61283	81603	11371	154257
AMMONIUM PHOSPHATE 18-46	44186	33798	62586	280	470	3051	3016	147387	141555	98369	387311
AMMONIUM PHOSPHATE		7500	51585	83518	107744	68696	3260	322303	25344		347647
NORMAL SUPERPHOSPHATE	445	15876	16625					32946	3902	4951	41799
TRIPLE SUPERPHOSPHATE	827	7559	25153	80		1409		35028	289	6691	42008
SULPHATE OF POTASH	1022	3103	14690			2	362	19179			19179
MURIATE OF POTASH	53080	145659	338848	22419	5278	26072	18643	609899	7544605	2962084	11116588
MIXED FERTILIZER			686	2555	1371	6476	8343	19431	99		19530
TOTAL	129986	[illegible]	[illegible]	563971	580836	841502	105064	[illegible]	[illegible]	[illegible]	[illegible]

FERTILIZER MATERIALS

SHIPMENTS TO DOMESTIC AND EXPORT MARKETS

FROM JUL 1977 TO JUN 1978

	DOMESTIC								EXPORT		
FERTILIZER MATERIAL	ATL PROV	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL CANADA	USA	OFFSHORE	TOTAL SHIPMENTS
UREA	1750	5922	44137	86390	53441	97475	10841	299956	255604	23568	579128
AMMONIUM SULPHATE		437	1490	5385	6487	29656	3238	46693	191579		238272
AMMONIUM NITRATE	26010	61033	120107	87689	58223	101120	18354	472536	144964		617500
ANHYDROUS AMMONIA	603	2897	28564	59515	29307	131180		252066	82229		334295
NITROGEN SOLUTION		23304	61717	19788	1680	20024		126513	70841		197354
AMMONIUM NITRATE PHOS 23-23			46	29703	55918	47266	2815	135748	87		135835
AMMONIUM NITRATE PHOS 27-14			3	5708	1243	4636	1175	12765	415		13180
AMMONIUM NITRATE PHOSPHATE				18735	7018	13172	1049	39974	830	9020	49824
AMMONIUM PHOSPHATE 11-48			348	62104	137350	134379	3658	337839	24266		362105
AMMONIUM PHOSPHATE 11-55			491	65206	60124	77641	5493	208955	107690		316645
AMMONIUM PHOSPHATE 16-20			200	2954	7806	20580	8826	40366	88849	23516	152731
AMMONIUM PHOSPHATE 18-46	66399	39993	64477	1521	12	4914	1600	178916	156486	60018	395420
AMMONIUM PHOSPHATE	35	10500	58945	28161	16105	10200	2785	126731	11317		138048
AMMONIATED SUPERPHOSPHATE		700	200					900			900
NORMAL SUPERPHOSPHATE	379	36882	41907					79168	4919		84087
TRIPLE SUPERPHOSPHATE	1876	16032	39186	2989	197	1321		61601	3107		64708
SULPHATE OF POTASH	680	3757	17892				263	22592			22592
MURIATE OF POTASH	46903	113792	256002	15761	798	23551	13404	470211	7542817	2552111	10565139
MIXED FERTILIZER			493	2456	1353	6500	7417	18219			18219
TOTAL	144635	315249	736205	494065	437062	723615	80918	2931749	8686000	2668233	14285982

****CANADIAN FERTILIZER INFORMATION SYSTEM****

FERTILIZER MATERIALS

SHIPMENTS TO DOMESTIC AND EXPORT MARKETS

FROM JUL 1,1976 TO JUN 30,1977

FERTILIZER MATERIAL	DOMESTIC ATL PROV	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL CANADA	EXPORT USA	OFFSHORE	TOTAL SHIPMENTS
UREA	1234	8317	43279	54036	22309	67821	14493	211489	89393		300882
AMMONIUM SULPHATE			20	4751	5839	33913	2086	46609	197276		243885
AMMONIUM NITRATE	19193	63116	128411	79150	48696	104024	13855	456445	167755		624200
ANHYDROUS AMMONIA		7045	56962	35922	11841	104209	18	216017	105103		321120
NITROGEN SOLUTION	1440	22132	63859	19893	202	9730		117256	78745		196001
AMMONIUM NITRATE PHOS 23-23			32	34037	44372	53073	4224	135738	88		135826
AMMONIUM NITRATE PHOS 27-14			7	5659	1044	6608	1038	14356	337		14693
AMMONIUM NITRATE PHOSPHATE				23212	5430	17898	1837	48377	99	13030	61506
AMMONIUM PHOSPHATE 11-48			340	58917	100994	124437	3797	288485	27915		316400
AMMONIUM PHOSPHATE 11-55			60	38012	36353	55026	5037	134488	128838		263326
AMMONIUM PHOSPHATE 16-20			220	2847	5798	22071	7400	38336	81616	48514	168466
AMMONIUM PHOSPHATE 18-46	57186	54505	63103	1626	177	3564	1899	182060	183946	89481	455487
AMMONIUM PHOSPHATE		3600	69400	16799	4730	6212	291	101032	4774		105806
AMMONIATED SUPERPHOSPHATE	3700	14590	2024					20314	3342		23656
NORMAL SUPERPHOSPHATE	3700	47262	53544					104506	6135		110641
TRIPLE SUPERPHOSPHATE	802	13080	36782					50664	17862	5019	73545
SULPHATE OF POTASH-MAGNESIA	3048	10677	13614	355		400	973	29087			29087
SULPHATE OF POTASH	883	3536	11715	100		123	444	16801			16801
MURIATE OF POTASH	50850	103122	261840	8216	1711	20996	11612	458355	7604737	1642219	9705311
MIXED FERTILIZER		104	313	2165	1309	7040	6467	17398	336		17734
TOTAL	142064	351086	805525	385697	290825	637145	75471	2687813	8698297	1798263	13184373

FERTILIZER MATERIALS

SHIPMENTS TO DOMESTIC AND EXPORT MARKETS

FROM JUL 1,1975 TO JUN 30,1976

	DOMESTIC								EXPORT		
FERTILIZER MATERIAL	ATL PROV	QUE	ONT	MAN	SASK	ALTA	BC	TOTAL CANADA	USA	OFFSHORE	TOTAL SHIPMENTS
UREA	737	9017	37672	31813	9020	57623	3004	148886	66577	5512	220975
AMMONIUM SULPHATE				4915	3423	26058	4417	38813	192066		230879
AMMONIUM NITRATE	17733	47548	133047	90013	40036	106327	13823	448527	160075		608602
ANHYDROUS AMMONIA		11138	49498	25928	4292	76007	19	166882	38876		205758
NITROGEN SOLUTION	2172	12716	50985	8362	130	2704	38	77107	74829		151936
AMMONIUM NITRATE PHOS 23-23	1608	236	541	40479	61733	53038	3303	160938	2020		162958
AMMONIUM NITRATE PHOS 27-14			12	5830	963	5919	835	13559	560		14119
AMMONIUM NITRATE PHOSPHATE				30472	8394	21501	1059	61426	289		61715
AMMONIUM PHOSPHATE 11-48			153	57320	113595	120396	4280	295744	21680		317424
AMMONIUM PHOSPHATE 11-55				33053	22321	43014	4248	102636	126532		229168
AMMONIUM PHOSPHATE 16-20				4423	7372	31055	10287	53137	77733		130870
AMMONIUM PHOSPHATE 18-46	52188	50541	91433			719	632	195513	162201	93571	451285
AMMONIUM PHOSPHATE	100	3000	64100	8640	5337	2944	11	84132	1474		85606
AMMONIATED SUPERPHOSPHATE	3700	14800						18500	3500		22000
NORMAL SUPERPHOSPHATE	4500	47883	56759					109142	9243		118385
TRIPLE SUPERPHOSPHATE	534	11286	26726			93		38639	1086	4339	44064
SULPHATE OF POTASH-MAGNESIA	2564	7331	22117	875	5	363	1099	34354			34354
SULPHATE OF POTASH	526	2308	11180			100	458	14572			14572
MURIATE OF POTASH	18594	101954	180859	5399	899	13905	14636	336246	6198217	1449466	7983929
MIXED FERTILIZER		534	303	2801	1098	5852	6876	17464	8791		26255
TOTAL	104956	320292	725385	350323	278618	567618	69025	2416217	7145749	1552888	11114854

AMMONIA

Company	Location	Annual Capacity Thousand Tonnes Material
Beker Industries	Sarnia, Ontario	145 (idle)
Canadian Industries Ltd.	Courtright, Ontario	360
Canadian Fertilizers Ltd.	Medicine Hat, Alberta	360
Canadian Fertilizers Ltd.	Medicine Hat, Alberta	360
Cominco Ltd.	Trail, B.C.	65
Cominco Ltd.	Calgary, Alberta	115
Cominco Ltd.	Carseland, Alberta	360
Cyanamid of Canada Ltd.	Welland, Ontario	225
Esso Chemicals	Redwater, Alberta	235
Genstar Chemical Limited	Maitland, Ontario	80
Sherritt Gordon Mines	Fort Saskatchewan, Alberta	145
J.R. Simplot Co.	Brandon, Manitoba	100
Western Cooperatives	Calgary, Alberta	65
Western Cooperatives	Medicine Hat, Alberta	60
Total Canada		2,530

AMMONIUM NITRATE

Company	Location	Annual Capacity Thousand Tonnes Material
Canadian Industries Ltd.	Beloeil, Quebec	65
Canadian Industries Ltd.	Courtright, Ontario	145
Canadian Industries Ltd.	Carseland, Alberta	225
Cominco, Ltd.	Calgary, Alberta	65
Cyanamid of Canada Ltd.	Welland, Ontario	180
Esso Chemicals	Redwater, Alberta	225
Genstar Chemical Limited	Maitland, Ontario	170
J.R. Simplot	Brandon, Manitoba	135
Western Cooperatives	Calgary, Alberta	77
Western Cooperatives	Medicine Hat, Alberta	60
Total Canada		1,347

UREA

Company	Location	Annual Capacity Thousand Tonnes Material	
Canadian Industries Ltd.	Courtright, Ontario	68	136 (1980)
Canadian Fertilizers Ltd.	Medicine Hat, Alberta	435	
Cominco	Calgary, Alberta	73	
Cominco Ltd.	Carseland, Alberta	435	
Cyanamid of Canada Ltd.	Welland, Ontario	90	
Genstar Chemical Ltd.	Maitland, Ontario	45	
Sherritt Gordon Mines	Fort Saskatchewan, Alberta	80	
J.R. Simplot Co.	Brandon, Manitoba	27	
Total Canada		1,253	(1,321 - 1980)

WET PROCESS PHOSPHORIC ACID

Company	Location	Annual Capacity Thousand Tonnes P205	
Belledune Fertilizers (Noranda)	Belledune, New Brunswick	136	
Canadian Industries Ltd.	Courtright, Ontario	87	
Cominco Ltd.	Kimberley, B.C.	114	
Cominco Ltd.	Trail, B.C.	76	
Esso Chemicals	Redwater, Alberta	218	
International Minerals & Chemical Corp.	Port Maitland, Ontario	118	
St. Lawrence Fertilizers (Noranda)	Valleyfield, Quebec		45 (idle)
Sherritt Gordon Mines	Fort Saskatchewan, Alberta	48	
Western Cooperatives	Medicine Hat, Alberta	73	
Western Cooperatives	Calgary, Alberta	100	
Total Canada		970	

Furnace Process Phosphoric Acid

Company	Location	Annual Capacity Thousand Tonnes P4
ERCO	Industries Ltd. Verraines, PQ	24
ERCO	Industries, Ltd. Longlsland, NFLD	53
	TOTAL CANADA	77

AMMONIUM PHOSPHATE

Company	Location	Annual Capacity Thousand Tonnes Material	
Belledune Fertilizers (Noranda)	Belledune, New Brunswick	272	
Canadian Industries Ltd.	Courtright, Ontario	172	
Cominco Ltd.	Kimberley, B.C.	188	
Cominco Ltd.	Trail, B.C.	188	
Esso Chemicals	Redwater, Alberta	425	
Sherritt Gordon Mines	Fort Saskatchewan, Alberta	123	
J.R. Simplot Co.	Brandon, Manitoba	145	
St. Lawrence Fertilizers (Noranda)	Valleyfield, Quebec		54 (idle)
Western Cooperatives	Calgary, Alberta	136	
Western Cooperatives	Medicine Hat, Alberta	181	
Total Canada		1,830	

SUPERPHOSPHATE

Company	Location	Annual Capacity Thousand Tonnes P205	
International Minerals & Chemical Corp	Port Maitland, Ontario	(Normal and triple) 69	
St. Lawrence Fertilizers	Valleyfield, Quebec	(triple)	60 (idle)
Total Canada		69	

POTASH

Company	Location	Annual Capacity Thousand Tonnes K20	
Central Canada (Noranda)	Colonsay, Saskatchewan	817	
Cominco	Vade, Saskatchewan	653	
International Minerals & Chem. Corp. K1	Esterhazy, Saskatchewan	1,161	
K2	Esterhazy, Saskatchewan	953	
Kalium Chemicals (PPG)	Belle Plaine, Saskatchewan	850	
Potash Corp. of America (Ideal Basic)	Lake Patience, Saskatchewan	417	
"	Sussex, New Brunswick		550 (1981)
Potash Corp. of Saskatchewan	Allan, Saskatchewan	828	
"	Cory, Saskatchewan	662	
"	Esterhazy*, Saskatchewan	-	(555)
"	Lanigan, Saskatchewan	544	
"	Rocanville, Saskatchewan	664	
Texasgulf	Allan**, Saskatchewan	-	(331)
		7,549	(8,099 - 1981)

* Mining and refining contract with I.M.C.
** 40% ownership of P.C.S. Allan Mine.

PART 2.0: MOUNTAIN AND PACIFIC UNITED STATES AMMONIA/FERTILIZER STATISTICS

Consumption Data Selected Direct Application Materials

Tons of Material

Mountain States	Pacific States
Montana	Washington
Idaho	Oregon
Wyoming	California
Colorado	
Utah	
Nevada	

Mountain and Pacific States: Consumption Summary

Year	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	149,982	189,425	273,708	359,942	438,188	372,206	392,591
Anhydrous Ammonia	162,554	227,230	306,697	420,049	457,170	421,790	403,483
Aqua Ammonia	339,232	354,009	388,956	548,831	587,022	537,462	514,315
Nitrogen Solutions	109,720	128,116	252,962	424,692	580,826	611,561	677,879
Urea	41,410	95,587	136,070	206,442	199,272	228,830	255,052
Ammonium Sulphate	271,280	505,923	559,678	564,793	744,044	708,801	619,458

Source 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Data: Selected Direct Application Materials

Tons of Material

Mountain States
Montana
Idaho
Wyoming
Colorado
Utah
Nevada

Mountain States: Consumption Summary

Year	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	70,099	98,498	157,966	224,307	280,879	241,328	238,722
Anhydrous Ammonia	19,114	28,297	81,405	128,969	142609	139,890	143,044
Aqua Ammonia	15,243	16,198	7,126	13,641	13,974	7,567	10,621
Nitrogen Solutions	30,653	26,195	65,423	91,965	139,601	121,182	161,270
Urea	3,754	15,840	19,499	30,126	33,332	47,099	55,952
Ammonium Sulphate	26,686	71,224	119,801	135,150	217,983	179,386	178,918

Consumption Data: Selected Direct Application Materials

Tons of Material

Pacific States:
Washington
Oregon
California

Pacific States
Consumption Summary

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	79,883	90,927	115,742	135,635	157,309	130,878	153,869
Anhydrous Ammonia	143,440	198,933	224,292	291,080	314,561	281,900	260,439
Aqua Ammonia	323,989	337,811	381,830	535,190	573,048	529,895	503,694
Nitrogen Solutions	79,067	101,921	187,539	332,727	441,225	490,379	516,609
Urea	37,656	79,747	116,571	176,316	165,940	181,731	199,100
Ammonium Sulphate	244,594	434,699	439,877	429,643	526,061	529,415	440,640

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Summary

Group Pacific & Mtn States

Year:	1960	1965	1970	1975	1975	1977	1978
Ammonium Nitrate	100.0	126.3	182.5	240.0	292.2	248.2	261.8
Anhydrous Ammonia	100.0	139.8	186.1	258.4	281.2	259.5	248.2
Aqua Ammonia	100.0	104.4	114.7	161.8	173.0	158.4	161.6
Nitrogen Solutions	100.0	116.8	230.6	327.1	529.4	557.4	617.8
Urea	100.0	230.2	322.6	498.5	481.2	582.6	615.9
Ammonium Sulphate	100.0	186.5	206.3	208.2	274.3	261.3	252.4

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Consumption Index : Selected Direct Application Materials

Base Year : 1960

State Summary

Group Pacific States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	113.8	144.9	169.8	196.9	163.8	192.6
Anhydrous Ammonia	100.0	138.7	156.4	202.9	219.3	196.5	181.6
Aqua Ammonia	100.0	104.3	117.9	165.2	176.9	163.6	155.5
Nitrogen Solutions	100.0	128.9	237.2	420.8	558.0	620.2	653.4
Urea	100.0	211.8	309.6	468.2	440.7	482.6	528.7
Ammonium Sulphate	100.0	177.7	179.8	175.7	215.1	216.5	180.1

Source : Based on 1978 Fertilizer Summary Data ; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Washington

Group Pacific States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	141.8	175.2	233.1	273.9	207.0	236.9
Anhydrous Ammonia	100.0	140.5	162.6	166.5	154.8	134.8	168.2
Aqua Ammonia	100.0	110.3	135.0	170.7	216.7	166.0	166.3
Nitrogen Solutions	100.0	206.6	321.9	552.9	735.2	668.1	802.9
Urea	100.0	462.5	561.3	1037.9	937.0	1019.4	1519.4
Ammonium Sulphate	100.0	163.7	218.5	144.7	207.6	216.0	202.4

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Base Year : 1960

State Oregon

Group Pacific States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	61.1	60.7	109.1	129.1	87.2	113.1
Anhydrous Ammonia	100.0	175.0	215.2	280.0	451.3	353.6	354.1
Aqua Ammonia	100.0	127.3	130.6	101.4	115.8	111.0	81.6
Nitrogen Solutions	100.0	351.2	683.6	1096.3	1472.3	1563.4	1509.4
Urea	100.0	333.6	522.2	594.4	869.1	975.7	863.8
Ammonium Sulphate	100.0	199.0	222.3	212.8	290.1	282.9	196.4

Source: Based on 1978 Fertilizer Summary Data ; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State California

Group Pacific States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	123.7	170.4	160.4	182.2	176.5	206.2
Anhydrous Ammonia	100.0	136.1	150.7	214.1	234.2	214.1	178.2
Aqua Ammonia	100.0	100.0	111.6	170.8	172.6	168.8	160.8
Nitrogen Solutions	100.0	97.3	190.6	349.4	461.7	552.9	567.1
Urea	100.0	143.4	216.6	353.6	254.8	273.6	298.1
Ammonium Sulphate	100.0	174.7	167.4	170.9	200.3	202.8	174.6

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year : 1960

State Summary

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	140.5	225.4	320.0	400.7	344.3	340.6
Anhydrous Ammonia	100.0	148.0	425.9	674.7	746.1	731.9	748.4
Aqua Ammonia	100.0	106.3	46.8	89.5	91.7	49.6	69.7
Nitrogen Solutions	100.0	85.5	213.4	300.0	455.4	395.3	526.1
Urea	100.0	422.0	519.4	802.5	887.9	1254.6	1490.5
Ammonium Sulphate	100.0	266.9	448.9	506.5	816.8	672.2	670.5

Source: Based on 1978 Fertilizer Summary Data ; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Montana

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	85.2	401.8	711.9	102.3	1030.5	857.6
Anhydrous Ammonia	100.0	54.2	145.6	354.5	224.4	369.0	158.9
Aqua Ammonia	Note: no AGO.GS consumption Base Year: 197 —	—	100.0	76.3	8.8	43.4	13.8
Nitrogen Solutions	100.0	3,145.5	10,309.1	3,909.1	10,697 7	11,688.6	11,638.6
Urea	100.0	446.2	478.9	63558	8,567.3	17,809.6	28,248.1
Ammonium Sulphate	100.0	99.2	436.8	1,104.7	283.8	1,012.5	776.7

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Idaho

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	135.3	216.7	266.6	308.4	275.8	276.3
Anhydrous Ammonia	100.0	167.4	402.8	707.6	877.9	774.3	813.8
Aqua Ammonia	100.0	103.5	45.2	91.9	93.8	53.6	77.2
Nitrogen Solutions	100.0	939.5	1,591.6	2,276.9	3,723.1	2,960.6	3,002.4
Urea	100.0	233.6	2260.2	2437.9	2771.4	3620.1	3716.9
Ammonium Sulphate	100.0	336.2	521.8	607.7	862.8	778.0	819.3

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Wyoming

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	283.5	655.7	959.7	739.1	669.0	636.5
Anhydrous Ammonia	100.0	178.1	126.5	413.8	597.6	775.7	821.3
Aqua Ammonia	-	-	-	100.0	2,481.8	290.9	-
Nitrogen Solutions	100.0	66.8	794.7	669.4	729.2	692.9	962.4
Urea	100.0	8.9	335	419.6	303.8	545.5	410.5
Ammonium Sulphate	100.0	179.6	2287	29.2	27.5	128.1	17.8

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Base Year : 1960

State Colorado

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	172.0	181.7	220.0	280.0	210.8	268.7
Anhydrous Ammonia	100.0	119.2	521.9	748.1	823.8	819.3	851.1
Aqua Ammonia	–	–	100.0	153.5	163.6	8.1	–
Nitrogen Solutions	100.0	140.6	487.4	909.5	1,184.3	1052.2	1994.1
Urea	100.0	232.4	64.1	243.4	277.9	331.5	517.7
Ammonium Sulphate	100.0	186.1	260.0	532.6	533.0	501.0	442.0

Source: Based on 1978 Fertilizer Summary Data ; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Utah

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	72.4	89.6	199.9	363.5	255.7	224.3
Anhydrous Ammonia	100.0	788.8	794.2	1,193.7	410.5	465.6	692.4
Aqua Ammonia	-	-	100 0	-	-	-	-
Nitrogen Solutions	100.0	500.0	9,230.7	14800.0	36,500.0	31,276.9	10,615.4
Urea	100.0	588.5	361.1	767.4	633.3	770.8	624.7
Ammonium Sulphate	100.0	180.5	175.4	146.5	1077.2	552.1	509.1

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

Consumption Index: Selected Direct Application Materials

Base Year: 1960

State Nevada

Group Mountain States

Year:	1960	1965	1970	1975	1976	1977	1978
Ammonium Nitrate	100.0	188.8	312.6	181.4	451.2	297.7	360.0
Anhydrous Ammonia	100.0	125.8	194.4	175.3	173.6	116.2	81.0
Aqua Ammonia	–	–	–	–	–	–	–
Nitrogen Solutions	100.0	35.2	19.7	756.3	3667.6	6987.3	1086.8
Urea	100.0	361.7	1398.3	356.7	248.3	701.7	308.3
Ammonium Sulphate	100.0	172.0	291.2	1113.0	1286.5	904.2	1,029.6

Source: Based on 1978 Fertilizer Summary Data; Tennessee Valley Authority

PART 3.0: WORLD PRODUCTION, TRADE AND CONSUMPTION STATISTICS FOR AMMONIA AND NITROGENOUS FERTILIZERS

Table 16. Production capacity of ammonia
Tableau 16. Capacité de production d'ammoniac
Cuadro 16. Capacidad de producción de amoníaco

('000 M.T. N)

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capacité Capacidad
AFRICA			
Algeria	272		
Sonatrach			
Arzew		1977/78	272
Annaba		1978/79	272
Egypt	272		
Egyptian Ch.Ind.			
Abu Qir		1979/80	272
El Nasr d'engrais Ch.			
Talkha II		1978/79	325
Gabon			
Soc. Chimique			
Port Gentil		1979/80	54
Kenya			
Ken-Ren			
Mombasa		1978/79	54
Libya			
Government			
Brega		1977/78	272
Morocco			
Nitromar			
Mohammadia		1979/80	89
Nigeria			
Government			
Port Harcourt		1982/83	475
Rhodesia	114		
Senegal			
Fertisen			
Cayar		1981/82	74
South Africa	559		
South African Coal			
Sasolburg		1980/81	82
Fedmis			
Sasolburg		1981/82	250
Sudan			
Government			
Port Sudan		1981/82	108
Zambia	25		
Nitrogen Chemical			
Kafue		1977/78	57
NORTH AND CENTRAL AMERICA			
Canada	1878		
Canada Fert. Ltd.			
Medicine Hat		1977/78	298
Cuba	313		
Mexico	1056		
Pemex			
Cosoleacaque		1977/78	365
		1977/78	365
Cunduacan			
Tabasco		1980/81	365
		1980/81	365
Netherlands Antilles	94		
Trinidad & Tobago	272		
Trinidad Nitr.Co.			
Point Lisas		1977/78	300
Amoco			
Point Lisas		1980/81	246
		1980/81	246
United States	15974		
American Cyanamid			
Fortier, La.		1978/79	179
California Pure Oil			
Ventura,Calif.		1977/78	73
Collier Carbon & Chem.			
Kenai, Alas.		1977/78	379
Columbia Nitrogen			
Augusta, Ga.		1978/79	379
First Miss. Corp.			
Donaldsonville, La.		1977/78	298
Georgia Pacific			
Plaquemine, La.		1978/79	146
Grace-Okl. Nitrogen			
Woodward, Okl.		1977/78	298
Jupiter Chem.			
Lake Charles, La.		1977/78	38
SOUTH AMERICA			
Argentina	64		
Brazil	233		
Petrofertil			
Camacari		1977/78	246

Table 16. (continued)
Tableau 16. (suite)
Cuadro 16. (continuación)

('000 M.T. N)

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capacité Capacidad
SOUTH AMERICA (concluded)			
Brazil (concluded)			
Petroquisa			
Araucaria		1979/80	323
Campos		1980/81	323
Laranjeiras		1980/81	246
Usimas			
Belo Horizonte		1977/78	4
Chile			
Petroquimica Chilena			
Magellan Straits		1982/83	365
Colombia	113		
Ferticol			
Barranca		1978/79	27
Peru	115		
Venezuela	650		
ASIA			
Afghanistan	58		
Bahrain			
Government			
Bahrain		1982/83	272
Bangladesh	233		
Bangladesh Dev. Corp.			
Ashuganj		1979/80	272
Chittagong		1981/82	272
Burma	66		
China	6319		
State Auth.			
Canton		1977/78	272
Anching		1977/78	272
Kweichou		1978/79	272
Szechuan		1977/78	272
Hunan		1978/79	272
Yunnan		1977/78	272
Hupeh		1978/79	272
Nanking		1978/79	272
Panshin		1977/78	272
Miaoli		1977/78	246

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capacité Capacidad
ASIA (continued)			
India	3160		
Fert. Corp. of India			
Korba		1982/83	244
Talcher		1977/78	244
Ramargundam		1977/78	244
Trombay		1979/80	244
Sindri		1978/79	244
Nangal		1977/78	244
Haldia		1977/78	163
Guajarat State Fert.			
Broach		1980/81	368
Ind.Far.Fert.Coop.			
Phulpur		1979/80	244
Maharashtra Coop.			
Thana		1980/81	54
Nagarjuna Fert.			
Kakinada		1980/81	244
National Fert.			
Bhatinda		1979/80	244
Panipat		1978/79	244
Indonesia	557		
Ministry of Industry			
Boutang		1980/81	406
Pertamina			
Tjikampek		1977/78	272
Pursi IV			
Palembang		1979/80	272
Iran	308		
Iranian Fert.			
Shiraz		1979/80	326
Shahpur Ch. Co.			
Bandar Shahpur		1977/78	272
Iraq	54		
Ministry of Industry			
Basrah		1977/78	216
Khor Al Zubair		1979/80	544
Israel	68		

Table 16. (continued)
Tableau 16. (suite)
Cuadro 16. (continuación)

('000 M.T. N)

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capcité Capacidad
ASIA			
Japan	3794		
Mitsubishi Gas Ch.			
Niigata		1977/78	216
Korea, D.P.R.	723		
Korea Rep.	792		
Namhae Ch.			
Yosu		1977/78	244
Kuwait	543		
Petrochemical Ind.			
Shuaiba		1982/83	272
Malaysia	41		
Pakistan	341		
National Fert. Corp.			
Mirpur Mathelo		1978/79	272
Multan		1977/78	247
Philippines	109		
Qatar	244		
Qatar Fert. Co.			
Um Said		1979/80	244
Saudi Arabia	162		
Sri Lanka			
State Fert. MFG Corp.			
Colombo		1979/80	147
Syria	42		
State Auth.			
Homs		1980/81	272
Thailand	27		
Turkey	125		
Azot Sanayii			
Gemlik		1979/80	272
Istanbul Gubre San.			
Yarimca		1977/78	272
Kirikkale		1981/82	272
Akdeniz Gubre San.			
Mersin		1982/83	272
United Arab Emirates			
Abu Dhabi National Oil			
Ruwais		1981/82	544

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capacité Capacidad
EUROPE			
Albania	50		
Austria	500		
Belgium-Luxembourg	659		
Bulgaria	810		
State Auth.			
Dimitrovgrad		1978/79	115
Czechoslovakia	997		
Denmark	32		
Finland	240		
France	2559		
Rhone-Pou & C.D.F.			
Rouen		1978/79	270
German D.R.	1318		
Germany Fed. Rep.	2388		
Veba Ch. & Superfos			
Brunsbuettel		1978/79	450
Greece	258		
Esso Pappas			
Thessaloniki		1979/80	86
Phosphoric Fert. Ind.			
Nea Karvala		1981/82	272
Hungary	789		
Iceland	8		
Ireland	38		
Nitrigen Eireann			
Teo Arklow		1978/79	365
Italy	1656		
SIR			
Lamezia		1978/79	193
Netherlands	2115		
Norway	653		
Poland	1849		
State Auth.			
Police		1979/80	406
Pulawy.		1980/81	136

Table 16. (concluded)
Tableau 16. (fin)
Cuadro 16. (fin)

('000 M.T. N)

Producer/Location Producteur/Emplacement Fabricante/Localidad	Present Présent Actual 1976/77	Start-up Démarrage En servicio	Capacity Capacité Capacidad
EUROPE (concluded)			
Portugal	287		
Romania	1988		
State Auth.			
Arad		1978/79	246
Tirgu Mures		1977/78	246
Craiova		1977/78	246
Hawau		1977/78	246
Turnu Magurele		1977/78	246
Spain	1214		
Sefanitro			
Cartagena		1981/82	272
Sweden	110		
Switzerland	57		
United Kingdom	1732		
Yugoslavia	606		
Ina Petrokemija			
Kutina		1981/82	370
OCEANIA			
Australia	419		
USSR	13284		
State Auth.			
Angarsk		1981/82	370
Cherepovets		1979/80	370
Cherkassy		1978/79	370
Chirchik		1977/78	370
Chernoretskoyo		1978/79	370
Dneprodzershinsk		1979/80	370
Dorogobuzh		1979/80	370
Gorlovka		1978/79	370
		1978/79	370
Grodno		1979/80	370
Ionaya		1977/78	370
Kemerovo		1981/82	370
Kuybyshev		1981/82	370
Losinyy		1981/82	370
Novokemerovo		1977/78	370
Novomoskovsk		1978/79	370
Novogorod		1979/80	370
Perm		1979/80	370
Odessa		1978/79	370
Rossosh		1981/82	370
Togliatti		1977/78	370
		1977/78	370
		1978/79	370
		1978/79	370

Table 18. Ammonia trade
Tableau 18. Commerce d'ammoniac
Cuadro 18. Comercio de amoníaco

	Imports-Importations-Importaciones				Exports-Exportations-Exportaciones			
	1973	1974	1975	1976	1973	1974	1975	1976
	.....	.....	.....	000 M.T. N	.....	.....	.....	.....
AFRICA								
Algeria	2.8	-	31.6	26.8	58.2	4.0	4.5	6.6
Ivory Coast	2.6	5.3	3.9*	4.2	-	-	-	-
Mauritius	-	4.5	4.1	11.7*	-	-	-	-
Morocco	7.5	12.0	18.9*	15.7*	-	-	-	-
Mozambique	-	-	19.0*	3.3*	-	-	-	-
Senegal	8.3	4.9	10.9*	12.8*	-	-	-	-
South Africa	51.0	115.0	31.2*	13.2*	...	...	16.1*	15.0*
NORTH & CENTRAL AMERICA								
Canada	13.0	15.6	6.1	18.0	60.0	78.5	95.1	185.5
Cuba	...	11.0	10.8	11.2*	-	-	-	-
Mexico	169.4	208.4	112.6*	50.2*	1.9	17.4	3.4*	9.0*
Netherlands Antilles	0.2	0.4	0.3	0.1	62.4	79.0	75.0*	68.0*
Trinidad & Tobago	-	29.9	63.4	36.7*	...	223.6	200.1	114.0*
United States	232.2	338.4	600.6	409.5*	672.2	291.2	223.2	327.2
SOUTH AMERICA								
Brazil	46.4	75.2	63.8	115.1*	-	-	-	-
Colombia	48.9	30.3	24.4	27.9	...	...	18.9	11.2
Venezuela	-	-	-	-	-	160.6	118.9	154.0*
ASIA								
India	-	-	-	28.0*	-	-	-	-
Indonesia	0.1	0.1	-	-	-	-	0.2	1.2
Iran	-	-	-	...	170.0	...	55.1	74.6*
Israel	-	-	-	-	-	2.5	3.8	-
Japan	-	-	-	-	43.3	47.6	104.6	89.3
Korea, Rep. of	25.5	1.5	1.8	2.9	-	-	-	-
Kuwait	-	-	-	-	63.8	118.3	101.5	143.2*
Malaysia								
Peninsular Malaysia	0.7	3.5	-	1.6*	0.2	0.2	...	...
Philippines	18.0	28.8	40.2	52.0*	-	-	-	-
Qatar	-	-	-	-	31.8	36.6	26.3*	38.8*
Turkey	53.0	27.3	115.8	167.4*	-	-	-	-
EUROPE								
Austria	1.1	16.4	7.9	-	...	...	...	165.0*
Belgium-Luxembourg	241.4*	243.7*	184.0*	214.4*	139.8	131.6	155.8	109.9
Bulgaria	-	-	-	-	3.3*	1.7	6.6	8.5
Czechoslovakia	47.0	18.0	18.0	69.6	7.0	77.0	22.0	5.3
Denmark	204.4	178.1	237.9	199.3	4.2	6.2	63.7	8.9
Finland	61.6	83.4	35.6	44.0	-	-	-	29.4
France	299.7	299.5	242.4	186.8	144.6	170.1	212.4	171.7
Germany, Fed.Rep.of	181.0	129.0	129.5	127.8	26.4	60.4	228.8	170.0
Greece	30.6	31.3	37.7	42.1	-	-	-	-
Hungary	-	-	20.7	2.0	30.6	31.1	37.6	101.6
Iceland	0.8	2.2	1.6	3.5*	-	-	-	-
Ireland	54.2	69.7	91.6	102.3	-	-	-	-
Italy	5.9	34.5	32.3	115.9	14.2	27.6	51.9	33.4
Netherlands	12.4	2.8	4.1	2.1	459.7	581.7	556.3	447.9
Norway	23.9	29.4	9.5	4.8	...	102.8*	44.2*	43.7*
Portugal	-	-	-	9.7	46.2	40.5	47.6	19.9*
Poland	23.0	43.5	64.7	95.9	13.1	1.0	2.1	-
Spain	119.2	106.1	231.2	167.5	1.9	-	-	-
Sweden	89.3	97.8	84.6	70.2	-	-	0.5	-
Switzerland	9.2	13.6	13.4	11.7	-	-	20.4	21.2
United Kingdom	...	194.5*	165.2*	146.7*	66.7	24.5	49.3*	33.0*
Yugoslavia	32.9	40.1	32.2	30.5	-	-	-	-
OCEANIA								
Australia	5.5	-	4.5	-	120.5	54.0	18.7	7.2*
U.S.S.R.	-	-	-	-	53.6	78.4	71.8	133.9

WORLD NITROGENOUS FERTILIZERS PRODUCTION
TRADE AND CONSUMPTION STATISTICS
FAO, 1978

TABLE I.
TABLEAU I.
CUADRO I.

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

PRODUCTION . MT : PRODUCTION MT : PRODUCCION MT .

	73/74	74/75	75/76	76/77
WORLD				
NITROGENOUS FERTILIZERS	40437282	42433092	43800506	45884026
AFRICA				
NITROGENOUS FERTILIZERS	461727	551735	594649	686665
ALGERIA				
NITROGENOUS FERTILIZERS	52000*	78700*	31000*	32700*
CAMEROON				
NITROGENOUS FERTILIZERS				1400*
EGYPT				
NITROGENOUS FERTILIZERS	50700	100200*	150540	199665
AMMONIUM SULPHATE	1150			
AMMONIUM NITRATE	29450	90200	150540F	190365
CALCIUM NITRATE	20100	10000F		9300
IVORY COAST				
NITROGENOUS FERTILIZERS	4941	5965	4500*	4400*
MAURITIUS				
NITROGENOUS FERTILIZERS		1000*	3900*	6900*
AMMONIUM NITRATE		1000*	3900*	6900*
MOROCCO				
NITROGENOUS FERTILIZERS	14250	10500*	18700*	13300*
AMMONIUM PHOSPHATE	14250	10500*	18700*	13300*
MOZAMBIQUE				
NITROGENOUS FERTILIZERS	8000*	3000*	2500*	4700*
AMMONIUM SULPHATE	8000*	3000*	2500*	4700*
RHODESIA				
NITROGENOUS FERTILIZERS	60000*	65000*	65000*	65000*
SENEGAL				
NITROGENOUS FERTILIZERS	8768	5000*	8700*	9000*
AMMONIUM PHOSPHATE	2320	2500F		
OTHER COMPLEX FERT	6448	2500F		
SOUTH AFRICA				
NITROGENOUS FERTILIZERS	257000*	271000*	300000*	332000*
TANZANIA				
NITROGENOUS FERTILIZERS	1768	3770	4209	5500*
AMMONIUM SULPHATE	998	3770	3459	
OTHER COMPLEX FERT	770		750	
TUNISIA				
NITROGENOUS FERTILIZERS				5000*
ZAMBIA				
NITROGENOUS FERTILIZERS	4300*	7600*	5600*	7100*
N C AMERICA				
NITROGENOUS FERTILIZERS	10464626	10033200	11114775	11552060
CANADA				
NITROGENOUS FERTILIZERS	802930	895000*	774700*	960000*
COSTA RICA				
NITROGENOUS FERTILIZERS	27000*	30000*	30000*	30791
AMMONIUM NITRATE	27000*	30000*	30000*	30791
CUBA				
NITROGENOUS FERTILIZERS	20000*	45900*	82000*	68000*
AMMONIUM NITRATE	20000*	33100*	64000*	
UREA		1300*	1500*	
OTHER NITROGEN FERT		11500*	16500*	
EL SALVADOR				
NITROGENOUS FERTILIZERS	7000*	7000*	5300	4455
MEXICO				
NITROGENOUS FERTILIZERS	375796	469000*	581000*	650000*
AMMONIUM SULPHATE	120343	136267		
AMMONIUM NITRATE	47157	52073		
UREA	157584	149497		
AMMONIUM PHOSPHATE	22485	23654		
OTHER NITROGEN FERT		80452*		
OTHER COMPLEX FERT	28227	27057		
NETH ANTILLE				
NITROGENOUS FERTILIZERS	6600*	21200*	6300*	2500*
TRINIDAD TIC				
NITROGENOUS FERTILIZERS	67300*	91100*	44475	46314
AMMONIUM SULPHATE			14805	15327
UREA			29670	30987
USA				
NITROGENOUS FERTILIZERS	9158000	8474000	9591000	9790000
AMMONIUM SULPHATE	521000	457000	509000	489000

	73/74	74/75	75/76	76/77
USA CONT.				
AMMONIUM NITRATE	1226000	1098000	1147000	1053000
UREA	532000	515000	854000	850000
AMMONIUM PHOSPHATE	978000	807000	898000	1026000
OTHER NITROGEN FERT	5901000	5597000	6183000	6372000
SOUTH AMERIC				
NITROGENOUS FERTILIZERS	359625	438334	447248	512970
ARGENTINA				
NITROGENOUS FERTILIZERS	28577	25000*	18000*	18000*
AMMONIUM SULPHATE	10675			
UREA	17902			
BRAZIL				
NITROGENOUS FERTILIZERS	114338	143630	160755	195000
AMMONIUM SULPHATE	3380	3946	7682	
AMMONIUM NITRATE	66770	82991	75888	
UREA	23639	24606	23996	
AMMONIUM PHOSPHATE	20549	32087	53189	
CHILE				
NITROGENOUS FERTILIZERS	106654	113326	115570	99762
SODIUM NITRATE	83461	101826	105355	82362
OTHER COMPLEX FERT	23193	11500	10215	17400
COLOMBIA				
NITROGENOUS FERTILIZERS	81336	86673	65547	66392
AMMONIUM SULPHATE			381	689
AMMONIUM NITRATE			6059	5574
UREA			30188	35942
OTHER COMPLEX FERT			28919	24187
ECUADOR				
NITROGENOUS FERTILIZERS	1500*	2000*	1726	2240
OTHER COMPLEX FERT	1500*	2000*	1726	2240
PERU				
NITROGENOUS FERTILIZERS	21120	20005	35850	56876
AMMONIUM SULPHATE	1978	1680	1881	1639
AMMONIUM NITRATE	19142	18325	10243	8149
UREA			21503	45164
OTHER COMPLEX FERT			2223	1924
VENEZUELA				
NITROGENOUS FERTILIZERS	6100*	47700*	49800*	74700*
AMMONIUM SULPHATE	6100*	47700*	49800*	74700*
ASIA				
NITROGENOUS FERTILIZERS	8025428	8824273	8693942	9369626
AFGHANISTAN				
NITROGENOUS FERTILIZERS		19117	14774	26203
UREA		19117	14774	26203
BANGLADESH				
NITROGENOUS FERTILIZERS	129700	32680	131088	130443*
AMMONIUM SULPHATE	1853	887	1304*	1300F
UREA	127847	31793	129784	129143
BURMA				
NITROGENOUS FERTILIZERS	36800	43328	47354	55490
UREA	36800	43328	47354	55490
CHINA				
NITROGENOUS FERTILIZERS	2791000F	3090000F	3172100F	3826800F
INDIA				
NITROGENOUS FERTILIZERS	1049900	1186600	1508000	1856800
AMMONIUM SULPHATE	118244	121416	125887	
AMMONIUM NITRATE	107750	101625	154375	
AMMONIUM SUL NITRATE	12480	6942	5938	
UREA	647680	797778	1010482	
AMMONIUM PHOSPHATE	79760	78342	93866	
OTHER NITROGEN FERT	3500	2550	3850	
OTHER COMPLEX FERT	80486	77947	114002	
INDONESIA				
NITROGENOUS FERTILIZERS	85200*	165900*	207500	250000*
AMMONIUM SULPHATE	10000*	25600*	24900	
UREA	75200*	140300*	182600	
IRAN				
NITROGENOUS FERTILIZERS	130765	131025	125700	155660
AMMONIUM SULPHATE	885	945	840	840
AMMONIUM NITRATE	5927	7800	5200	5200
UREA	89100	89700	87080	113620
AMMONIUM PHOSPHATE	34853	32580	32580	36000
IRAQ				
NITROGENOUS FERTILIZERS	28124	33600	24300*	25332
AMMONIUM SULPHATE	18924	19800		17880
UREA	9200	13800		7452
ISRAEL				
NITROGENOUS FERTILIZERS	31805	39135	45390	46210

TABLE
TABLEAU
CUADRO

NITROGENEOUS FERTILIZERS

PRODUCTION MT . PRODUCTION MT . PRODUCCION MT .

	73/74	74/75	75/76	76/77
ISRAEL CONT.				
AMMONIUM SULPHATE	12655	14640	17650	19125
AMMONIUM NITRATE	1400	780	690	
UREA	7950	11340	12565	12820
OTHER NITROGEN FERT	7885	10205	12215	13925
OTHER COMPLEX FERT	1915	2170	2270	2340
JAPAN				
NITROGENOUS FERTILIZERS	2138300*	2340900*	1557000	1149000
AMMONIUM SULPHATE	394700	383700	402000	384000
AMMONIUM NITRATE	16400	11300	11000	12000
CALCIUM CYANAMIDE	28800	36100	29000	27000
UREA	1187200	1378900	695000	324000
OTHER NITROGEN FERT	184200	187100	161000	115000
OTHER COMPLEX FERT	3270004	3438004	259000	287000
KOREA DPR				
NITROGENOUS FERTILIZERS	2400004	2500004	2600004	2700004
KOREA REP				
NITROGENOUS FERTILIZERS	447255	513773	540641	5103004
AMMONIUM SULPHATE	942	11858	27592	
UREA	326122	379332	380139	
OTHER COMPLEX FERT	120191	122583	132910	
KUWAIT				
NITROGENOUS FERTILIZERS	290500	275500	258700	228000
AMMONIUM SULPHATE	23700	22900	8700	
UREA	266800	252600	250000	228000
LEBANON				
NITROGENOUS FERTILIZERS			1200*	1200*
PAL PETASUL				
NITROGENOUS FERTILIZERS	46200*	37000*	34000*	38700*
PAKISTAN				
NITROGENOUS FERTILIZERS	299860	310810	316430	309286
AMMONIUM SULPHATE	19180	19750	20390	21084
AMMONIUM NITRATE	16490	15440	18400	16780
UREA	264190	275620	277640	271422
PHILIPPINES				
NITROGENOUS FERTILIZERS	53496	53419	62100	48400
AMMONIUM SULPHATE	17514	15695	29600	15300
UREA	5371	5246	6300	6300
AMMONIUM PHOSPHATE	17047	29751	13900	16800
OTHER COMPLEX FERT	13564	2727	12300	10000
QATAR				
NITROGENOUS FERTILIZERS	14000*	55453	87000*	86600*
UREA	14000*	55453	87000*	86600*
SAUDI ARABIA				
NITROGENOUS FERTILIZERS	60700	80600*	99820	84134
UREA	60700	80600*	99820	84134
SYRIA				
NITROGENOUS FERTILIZERS	9465	12500	26000	26000
AMMONIUM NITRATE	9465	12500	26000	26000
THAILAND				
NITROGENOUS FERTILIZERS	7358	6722	4298	6000*
AMMONIUM SULPHATE	5020	4435	3135	
UREA	2338	2287	1163	
TURKEY				
NITROGENOUS FERTILIZERS	135000	146211	170547	212068
AMMONIUM SULPHATE	13700	11884	16356	30841
AMMONIUM NITRATE	120500	119282	125182	151782
AMMONIUM PHOSPHATE	800	15045	29009	29445
VIET NAM				
NITROGENOUS FERTILIZERS				25000*
EUROPE				
NITROGENOUS FERTILIZERS	13719676	14581550	14302892	15011705
ALBANIA				
NITROGENOUS FERTILIZERS	36000*	36000*	36000*	45000*
AMMONIUM NITRATE	36000*	36000*	36000*	45000*
AUSTRIA				
NITROGENOUS FERTILIZERS	230450	226190	256000*	239000*
AMMONIUM SULPHATE		200		
AMMONIUM NITRATE	153650	142850		
UREA	3880	1700		
OTHER COMPLEX FERT	72920	81440		
BELGIUM-LUX				
NITROGENOUS FERTILIZERS	653812	641386	609961	652000*
AMMONIUM SULPHATE	139744	110764	130193	
AMMONIUM NITRATE	191314	202420	198846	
CALCIUM CYANAMIDE	10055	7653	4190	
AMMONIUM PHOSPHATE	24545	21655	13853	

	73/74	74/75	75/76	76/77
BELGIUM-LUX CONT.				
OTHER NITROGEN FERT	109875	117193	122481	
OTHER COMPLEX FERT	178279	181701	140398	
BULGARIA				
NITROGENOUS FERTILIZERS	518604	592863	672462	663047
AMMONIUM SULPHATE	21289	22766	23737	23252
AMMONIUM NITRATE	290823	300884	353869	346190
SODIUM NITRATE	2254	2104	2340	2432
UREA	204238	267109	292516	291173
CZECHOSLOVAK				
NITROGENOUS FERTILIZERS	413800	483300	4956004	5625004
AMMONIUM SULPHATE	69600	66600		
AMMONIUM NITRATE	185000	190300		
CALCIUM NITRATE	28800	27900		
CALCIUM CYANAMIDE	7400	7200		
UREA	51000	65900		
OTHER NITROGEN FERT	15900	38800		
OTHER COMPLEX FERT	56100	86600		
DENMARK				
NITROGENOUS FERTILIZERS	63593	81339	80033	109301
AMMONIUM NITRATE	18984	21578	22944	18256
OTHER NITROGEN FERT	1876	7393	5429	9458
OTHER COMPLEX FERT	42733	52368	51660	81587
FINLAND				
NITROGENOUS FERTILIZERS	243556	252212	202047	190351
AMMONIUM SULPHATE	8000			
AMMONIUM NITRATE	52534	56442	48992	42211
CALCIUM NITRATE	4157	3603	2544	992
UREA	45076	38339	20109	19075
OTHER NITROGEN FERT	1347	1836	2929	858
OTHER COMPLEX FERT	132442	151992	127473	127215
FRANCE				
NITROGENOUS FERTILIZERS	1642300	1694100	1361000	14620004
AMMONIUM SULPHATE	31050			
AMMONIUM NITRATE	795222			
CALCIUM NITRATE	10794			
UREA	53375			
OTHER NITROGEN FERT	7518594			
GERMAN DR				
NITROGENOUS FERTILIZERS	410798	435958	538336	776121
AMMONIUM SULPHATE	159466	163245	163510	165325
AMMONIUM NITRATE	178549	214332	221299	223345
OTHER NITROGEN FERT	72783	58381	153527	387451
GERMANY FED				
NITROGENOUS FERTILIZERS	1472967	1574089	1258956	1289830
AMMONIUM SULPHATE	275853	302240	208568	239931
AMMONIUM NITRATE	560587	627122	569455	478250
AMMONIUM SUL NITRATE	117796	116624	106312	136294
CALCIUM NITRATE	3870	6127	5642	5862
CALCIUM CYANAMIDE	69931	68809	64848	58922
OTHER COMPLEX FERT	444930	453167	304131	370571
GREECE				
NITROGENOUS FERTILIZERS	262985	264100	288460	273021
HUNGARY				
NITROGENOUS FERTILIZERS	424243	4162004	421000	492000
AMMONIUM SULPHATE	8097	8500	9014	8791
AMMONIUM NITRATE	302854	295061	3084124	3292574
UREA	92014	87626	103574	153952
OTHER COMPLEX FERT	21778	25013		
ICELAND				
NITROGENOUS FERTILIZERS	9674	7315	8982	10657
AMMONIUM NITRATE	2529	2490	2966	2954
OTHER COMPLEX FERT	7145	4825	6016	7703
IRELAND				
NITROGENOUS FERTILIZERS	94500*	97000*	100000*	90500*
ITALY				
NITROGENOUS FERTILIZERS	1129300*	1131442	999685	985312
AMMONIUM SULPHATE	254950	245175	218536	235370
AMMONIUM NITRATE	166602	186129	168332	197630
AMMONIUM SUL NITRATE	2813			
CALCIUM NITRATE	25071	22232	23772	18840
CALCIUM CYANAMIDE	693			
UREA	419286	432258	371515	312640
OTHER NITROGEN FERT	89	7		1830
OTHER COMPLEX FERT	2597964	245641	217530	219002
NETHERLANDS				
NITROGENOUS FERTILIZERS	1211761	1334532	1153985	12530004
AMMONIUM SULPHATE	97833	75776	121356	
AMMONIUM NITRATE	432816	465420	436902	
CALCIUM NITRATE	19383	22594	18272	
UREA	406663	503546	341640	
AMMONIUM PHOSPHATE	22764	21805	18690	

TABLE [illegible]
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CUADRO [illegible]

NITROGENOUS FERTILIZERS ENGRAIS AZOTES ABONOS NITROGENADOS

PRODUCTION : MT N	73/74	74/75	75/76	76/77
NETHERLANDS CONT.				
OTHER NITROGEN FERT	54106	71436	93782	
OTHER COMPLEX FERT	178196	173755	123335	
NORWAY				
NITROGENOUS FERTILIZERS	444700	390700	356100	337000
AMMONIUM NITRATE	4000	3900		
CALCIUM NITRATE	98200	100200	101600	93100
UREA	42900	19500	29400	11500
OTHER NITROGEN FERT	58600	18200	14000	16500
OTHER COMPLEX FERT	241000	248400	211100	215900
POLAND				
NITROGENOUS FERTILIZERS	1365588	1457470	1532601	1548136
AMMONIUM SULPHATE	73538	80779	89592	94005
AMMONIUM NITRATE	798327	852908	900261	900345
SODIUM NITRATE	301	250	154	175
CALCIUM NITRATE	6911	1850		
UREA	409781	426356	424653	436304
AMMONIUM PHOSPHATE	67355	88749	113160	115403
OTHER NITROGEN FERT	9375	6578	4781	1904
PORTUGAL				
NITROGENOUS FERTILIZERS	164000*	191000*	203000*	176100*
ROMANIA				
NITROGENOUS FERTILIZERS	854000	980000	1292000	1331000
SPAIN				
NITROGENOUS FERTILIZERS	762678	721998*	825388*	883248*
AMMONIUM SULPHATE	131156	103106*	121721*	98718*
AMMONIUM NITRATE	282094	289319*	337529*	370305*
AMMONIUM SUL NITRATE	49413	44564*	62816*	59034*
CALCIUM CYANAMIDE	2348			
UREA	93564	76866*	120244*	135427*
OTHER NITROGEN FERT	20385	17984*	16691*	18620*
OTHER COMPLEX FERT	183718	190159*	166387*	201144*
SWEDEN				
NITROGENOUS FERTILIZERS	178325	175554	169363	151081
AMMONIUM SULPHATE	1320	1171	1200	1014
AMMONIUM NITRATE	51017	52623	51913	38997
CALCIUM NITRATE	4330	4065	4814	5620
UREA	25345	24503	18522	15345
OTHER NITROGEN FERT	1452	1911	1036	622
OTHER COMPLEX FERT	94861	91281	91880	89483
SWITZERLAND				
NITROGENOUS FERTILIZERS	26400	29400	29400	31500
AMMONIUM SULPHATE	400			
AMMONIUM NITRATE	21400	26000	25900	27700
CALCIUM NITRATE	1300	500	700	600
OTHER COMPLEX FERT	3300	2900	2800	3200
UK				
NITROGENOUS FERTILIZERS	755400	997000	1055000	1071000*
YUGOSLAVIA				
NITROGENOUS FERTILIZERS	350242	370902	357533	389000
AMMONIUM SULPHATE	2450	2054	2533	2300
AMMONIUM NITRATE	178229	184374	182000	194400
UREA	73676	78107	79000	85200
OTHER NITROGEN FERT	14887	6367	8000	6100
OTHER COMPLEX FERT	81000	100000	86000	101000
OCEANIA				
NITROGENOUS FERTILIZERS	197200	198000	180000	220000
AUSTRALIA				
NITROGENOUS FERTILIZERS	197200*	198000*	180000*	220000*
AMMONIUM SULPHATE		55000*	46000*	
AMMONIUM NITRATE		26000*	23000*	
UREA		54000*	54000*	
AMMONIUM PHOSPHATE		25000*	14000*	
OTHER NITROGEN FERT		38000*	43000*	
USSR				
NITROGENOUS FERTILIZERS	7209000	7806000	8467000	8531000
DEV.PED M E				
NITROGENOUS FERTILIZERS	22281878	22397794	21762983	22053111
N AMERICA				
NITROGENOUS FERTILIZERS	9960930	9369000	10365700	10750000
W EUROPE				
NITROGENOUS FERTILIZERS	9696643	10179759	9314893	9593901
OCEANIA				
NITROGENOUS FERTILIZERS	197200	198000	180000	220000
OTH DEV.PED				
NITROGENOUS FERTILIZERS	2427105	2651035	1902390	1529210
DEV.PING M E				
NITROGENOUS FERTILIZERS	3892371	4487507	5150424	5720311

PRODUCTION : MT N	73/74	74/75	75/76	76/77
AFRICA				
NITROGENOUS FERTILIZERS	154027	180535	144109	155000
LAT AMERICA				
NITROGENOUS FERTILIZERS	863321	1102534	1196323	1319030
NEAR EAST				
NITROGENOUS FERTILIZERS	719254	854206	958581	1044862
FAR EAST				
NITROGENOUS FERTILIZERS	2155769	2350232	2851411	3205419
CENTR PLANNO				
NITROGENOUS FERTILIZERS	14263033	15547791	16887099	18070604
ASIAN CPE				
NITROGENOUS FERTILIZERS	3031000	3340000	3432100	4121800
E EUR+USSR				
NITROGENOUS FERTILIZERS	11232033	12207791	13454999	13948804
DEV.PED ALL				
NITROGENOUS FERTILIZERS	33513911	34605585	35217982	36041915
DEV.PING ALL				
NITROGENOUS FERTILIZERS	6923371	7827507	8582524	9842111

NITROGENOUS FERTILIZERS ENGRAIS AZOTES ABONOS NITROGENADOS

IMPORTS MT N IMPORTATIONS MT N IMPORTACION MT N

	73/74	74/75	75/76	76/77
WORLD				
NITROGENOUS FERTILIZERS	8147650	8185284	8234525	8816353
AFRICA				
NITROGENOUS FERTILIZERS	597030	666550	700337	796659
ALGERIA				
NITROGENOUS FERTILIZERS	28157	36500	51100*	48300
ANGOLA				
NITROGENOUS FERTILIZERS	9100	6500	2100*	1000*
BENIN				
NITROGENOUS FERTILIZERS	1300*	1341	791	1000*
BOTSWANA				
NITROGENOUS FERTILIZERS	1200*	1161	1900*	1000*
BURUNDI				
NITROGENOUS FERTILIZERS	228	601	329	300*
AMMONIUM SULPHATE	30	181		
AMMONIUM NITRATE	9	6	13	
UREA		233	195	
OTHER COMPLEX FERT	189	181	121	
CAMEROON				
NITROGENOUS FERTILIZERS	9326	9763	6100*	7000*
CAPE VERDE				
NITROGENOUS FERTILIZERS	28	23	50F	100*
CENT AFR EMP				
NITROGENOUS FERTILIZERS	937	1800	600*	500*
CHAD				
NITROGENOUS FERTILIZERS	2212	4500*	2800*	3100*
CONGO				
NITROGENOUS FERTILIZERS	1200	200*	200*	300*
EGYPT				
NITROGENOUS FERTILIZERS	260000	263500*	227400*	274000
AMMONIUM SULPHATE	32467	44853	13000	83000
AMMONIUM NITRATE	30225	28986	65000	91000
UREA	197308*	189661*	149400*	100000
EQ GUINEA				
NITROGENOUS FERTILIZERS	100*	100*	100*	100*
ETHIOPIA				
NITROGENOUS FERTILIZERS	8985	10020	13069	9000*
AMMONIUM SULPHATE	453	462	525	
AMMONIUM NITRATE	13			
UREA	4549	5014	2024	
AMMONIUM PHOSPHATE	3780	2484	9720	
OTHER COMPLEX FERT	190	2060	800	
GABON				
NITROGENOUS FERTILIZERS	21	30F	300*	300*
GAMBIA				
NITROGENOUS FERTILIZERS	302	400	165	200*
GHANA				
NITROGENOUS FERTILIZERS	3361	3212	14200*	9000*
UREA	5			
OTHER COMPLEX FERT	2484	2720		
GUINEA				
NITROGENOUS FERTILIZERS	800*	650	600*	600*
GUIN BISSAU				
NITROGENOUS FERTILIZERS	100*	317	100*	100*
IVORY COAST				
NITROGENOUS FERTILIZERS	2192	5200*	4600*	8000*
KENYA				
NITROGENOUS FERTILIZERS	20370	24801	19480	23791
AMMONIUM SULPHATE	2556	2300	2380	3045
AMMONIUM NITRATE		5890	3250	3250
AMMONIUM SUL NITRATE	4435	4915	1150	4732
CALCIUM NITRATE				155
UREA	1137	1496	460	1334
OTHER NITROGEN FERT	9228	7800	6370	8765
OTHER COMPLEX FERT	3010	2400	5870	2510
LESOTHO				
NITROGENOUS FERTILIZERS	135	136	300*	300*
LIBERIA				
NITROGENOUS FERTILIZERS	2189	1200*	3056	4287
AMMONIUM SULPHATE	26		14	149

	73/74	74/75	75/76	76/77
LIBERIA CONT.				
AMMONIUM NITRATE	1387		2880	3517
SODIUM NITRATE	234			
OTHER NITROGEN FERT	38		78	612
OTHER COMPLEX FERT	504		84	9
LIBYA				
NITROGENOUS FERTILIZERS	70000*	101000*	180000*	101000*
MADAGASCAR				
NITROGENOUS FERTILIZERS	4739	4980	3514	6000*
AMMONIUM SULPHATE	319	995	337	
UREA	3120	3557	2569	
AMMONIUM PHOSPHATE	36			
OTHER NITROGEN FERT	216			
OTHER COMPLEX FERT	1048	428	212	
MALAWI				
NITROGENOUS FERTILIZERS	9198	7194	11924	17922
AMMONIUM SULPHATE	3385	4725	10689	11456
AMMONIUM NITRATE	1794	916	1185	2028
SODIUM NITRATE	48			128
UREA	1571	27	90	97
OTHER COMPLEX FERT	2400	1526		4218
MALI				
NITROGENOUS FERTILIZERS	5043	2947	1600*	4500*
MAURITANIA				
NITROGENOUS FERTILIZERS	174	358	1100*	500
MAURITIUS				
NITROGENOUS FERTILIZERS	11170	8674	7106	6200*
AMMONIUM SULPHATE	5812	5900	4725	
AMMONIUM SUL NITRATE	202	403	156	
AMMONIUM PHOSPHATE		1000		
OTHER NITROGEN FERT	5164	1371	2225	
MOROCCO				
NITROGENOUS FERTILIZERS	56552	60650	47994	66800
AMMONIUM SULPHATE	18333	16795	12008	
AMMONIUM NITRATE	6399	7210	15288	
AMMONIUM SUL NITRATE		16		
SODIUM NITRATE	54	102		
CALCIUM NITRATE	10			
UREA	31756	36967	17745	
OTHER NITROGEN FERT			2639	
OTHER COMPLEX FERT			314	
MOZAMBIQUE				
NITROGENOUS FERTILIZERS	1000*	700*	1200*	2300*
NIGER				
NITROGENOUS FERTILIZERS	220	161	199	548
AMMONIUM SULPHATE	1	71		59
UREA	161	90	184	414
OTHER COMPLEX FERT	58		15	35
NIGERIA				
NITROGENOUS FERTILIZERS	4700*	13200*	30200*	49300*
REUNION				
NITROGENOUS FERTILIZERS	6100*	3300*	3700*	4100*
RHODESIA				
NITROGENOUS FERTILIZERS	10000*	10000*	10000*	15000*
RWANDA				
NITROGENOUS FERTILIZERS	83	147	140	156
SENEGAL				
NITROGENOUS FERTILIZERS	1680	6200*	4300*	7000*
AMMONIUM SULPHATE	30	200F		
UREA	1650	6000F		
SIERRA LEONE				
NITROGENOUS FERTILIZERS	1135	1044	2200*	700*
SOMALIA				
NITROGENOUS FERTILIZERS	2100*	1900*	1840	
SOUTH AFRICA				
NITROGENOUS FERTILIZERS	7378	23499	36160	25657
AMMONIUM SULPHATE		3826	8869	12556
AMMONIUM NITRATE		10123	16871	4616
UREA		9550	10338	7967
OTHER NITROGEN FERT			82	518
SUDAN				
NITROGENOUS FERTILIZERS	54693	60316	104800*	96300*
AMMONIUM SULPHATE	4200	2520	5150	
AMMONIUM NITRATE	13	20		
UREA	50480	57776	99650*	
SWAZILAND				
NITROGENOUS FERTILIZERS	5320	5300*	5500*	6000*

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

IMPORTS — MT — IMPORTATIONS — MT — IMPORTACION — MT

	73/74	74/75	75/76	76/77
SWAZILAND CONT.				
AMMONIUM SULPHATE	271			
AMMONIUM NITRATE	1056			
UREA	3092			
AMMONIUM PHOSPHATE	28			
OTHER NITROGEN FERT	873			
TANZANIA				
NITROGENOUS FERTILIZERS	10234	9736	10166	9000*
AMMONIUM SULPHATE	5071	6027	4299	
AMMONIUM NITRATE	823	1950	3586	
AMMONIUM SUL NITRATE	576			
UREA	918	1656	1656	
OTHER COMPLEX FERT	2846	103	225	
TOGO				
NITROGENOUS FERTILIZERS	345	809	847	948
AMMONIUM SULPHATE	252			
UREA	23	308	322	
OTHER NITROGEN FERT	70	501	525	
TUNISIA				
NITROGENOUS FERTILIZERS	19059	29680	15075	27100*
UGANDA				
NITROGENOUS FERTILIZERS	4000*	1600*	872	1463
AMMONIUM SULPHATE			105	63
AMMONIUM NITRATE			107	260
UREA			660	
OTHER COMPLEX FERT				1140
UPPER VOLTA				
NITROGENOUS FERTILIZERS	356	700*	400*	2200*
ZAIRE				
NITROGENOUS FERTILIZERS	3200*	3100*	5060	6187
UREA	3200*	3100*	5060	6187
ZAMBIA				
NITROGENOUS FERTILIZERS	19300*	28300*	27500*	38400*
N C AMERICA				
NITROGENOUS FERTILIZERS	1581775	1741276	1753690	2348872
BAHAMAS				
NITROGENOUS FERTILIZERS	786	524	463	529
BARBADOS				
NITROGENOUS FERTILIZERS	2190*	1500*	1200*	700*
BELIZE				
NITROGENOUS FERTILIZERS	647	600*	800*	300*
CANADA				
NITROGENOUS FERTILIZERS	24881	44600*	61777	81000*
COSTA RICA				
NITROGENOUS FERTILIZERS	23000*	24300*	13182	16866
CUBA				
NITROGENOUS FERTILIZERS	145800*	115200	132500	128000*
AMMONIUM SULPHATE		52300	65100	
AMMONIUM NITRATE		9300	8700	
UREA		52100	50500	
OTHER NITROGEN FERT		1500	7800	
DOMINICAN RP				
NITROGENOUS FERTILIZERS	40625	46201	40900*	25000*
EL SALVADOR				
NITROGENOUS FERTILIZERS	66629	57500*	64100*	79067
GUADELOUPE				
NITROGENOUS FERTILIZERS	4000*	2500*	3313	3353
AMMONIUM SULPHATE			11	52
AMMONIUM NITRATE			159	72
UREA			35	434
OTHER COMPLEX FERT			3108	2795
GUATEMALA				
NITROGENOUS FERTILIZERS	32000	36900	35100*	41000*
HAITI				
NITROGENOUS FERTILIZERS	700*	903	1200*	100*
AMMONIUM SULPHATE	100F	200		
UREA	350F	424		
OTHER COMPLEX FERT	250F	279		
HONDURAS				
NITROGENOUS FERTILIZERS	15000*	8500*	11400*	11000*
JAMAICA				
NITROGENOUS FERTILIZERS	8000*	9300*	6000*	7300*
MARTINIQUE				
NITROGENOUS FERTILIZERS	4500*	4600*	2592	3999

	73/74	74/75	75/76	76/77
MARTINIQUE CONT.				
AMMONIUM SULPHATE			915	775
AMMONIUM NITRATE			20	27
UREA			429	164
OTHER COMPLEX FERT			1628	3033
MEXICO				
NITROGENOUS FERTILIZERS	192361	252820	248800*	241000*
AMMONIUM SULPHATE	19700	43235		
AMMONIUM NITRATE	6193	13878		
AMMONIUM PHOSPHATE		2701		
OTHER NITROGEN FERT	165496	182776		
OTHER COMPLEX FERT	972	10230		
NICARAGUA				
NITROGENOUS FERTILIZERS	35000*	31700*	6800*	22800*
PANAMA				
NITROGENOUS FERTILIZERS	11805	13443	13416	11000*
ST KITTS ETC				
NITROGENOUS FERTILIZERS	200*	200*	300*	300*
ST LUCIA				
NITROGENOUS FERTILIZERS	1500*	1500*	1600*	1600*
ST VINCENT				
NITROGENOUS FERTILIZERS	1700*	1800*	2100*	2100*
TRINIDAD ETC				
NITROGENOUS FERTILIZERS	51	185	47	158
AMMONIUM NITRATE			6	6
UREA			3	6
OTHER NITROGEN FERT			38	146
USA				
NITROGENOUS FERTILIZERS	970000	1086000	1105000	1671000
AMMONIUM SULPHATE	52000	47000	80000	87000
AMMONIUM NITRATE	92000	96000	90000	105000
SODIUM NITRATE	15000	29000	13000	20000
CALCIUM NITRATE	26000	16000	10000	10000
CALCIUM CYANAMIDE	1000	11000	7000	
UREA	218000	264000	172000	477000
AMMONIUM PHOSPHATE	195000	152000	112000	130000
OTHER NITROGEN FERT	371000	471000	621000	842000
VIRGIN IS US				
NITROGENOUS FERTILIZERS	400*	500*	700*	700*
SOUTH AMERIC				
NITROGENOUS FERTILIZERS	502623	547199	380817	524221
ARGENTINA				
NITROGENOUS FERTILIZERS	15266	20500*	10400*	21000*
AMMONIUM SUL NITRATE	1424			
SODIUM NITRATE	2283			
UREA	5728			
OTHER NITROGEN FERT	45			
OTHER COMPLEX FERT	5786			
BOLIVIA				
NITROGENOUS FERTILIZERS	2769	3800*	1600*	1300*
BRAZIL				
NITROGENOUS FERTILIZERS	234553	245380	228467	272026
AMMONIUM SULPHATE	109934	90708	94244	
AMMONIUM NITRATE		1749		
AMMONIUM SUL NITRATE	3666	8262	390	
SODIUM NITRATE	4472	4180	1624	
CALCIUM NITRATE	234			
CALCIUM CYANAMIDE	158	270		
UREA	45304	61848	51517	
AMMONIUM PHOSPHATE	64638	74590	78893	
OTHER NITROGEN FERT	2844	1379	1157	
OTHER COMPLEX FERT	3303	2394	642	
CHILE				
NITROGENOUS FERTILIZERS	29363	26665	17751	504
COLOMBIA				
NITROGENOUS FERTILIZERS	82196	81748	5477	63167
AMMONIUM SULPHATE			2122	7350
CALCIUM NITRATE			29	
UREA			2746	48254
AMMONIUM PHOSPHATE			572	5900
OTHER COMPLEX FERT			8	1663
ECUADOR				
NITROGENOUS FERTILIZERS	27221	20138	11823	33224
AMMONIUM SULPHATE	804	3781	10	3280
AMMONIUM NITRATE		196	39	194
AMMONIUM SUL NITRATE				28
SODIUM NITRATE		16		
CALCIUM NITRATE	44	30		717
UREA	20409	14362	6716	26132

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

IMPORTS — MT N — IMPORTATIONS — MT N — IMPORTACION — MT N

	73/74	74/75	75/76	76/77
ECUADOR CONT.				
AMMONIUM PHOSPHATE	3060	1350	2358	180
OTHER NITROGEN FERT	187	134	1396	2640
OTHER COMPLEX FERT	2717	269	1304	55
GUYANA				
NITROGENOUS FERTILIZERS	9260	12700e	7703	8100e
PARAGUAY				
NITROGENOUS FERTILIZERS	1000e	667	300e	500e
PERU				
NITROGENOUS FERTILIZERS	54895	108465	49000e	40000e
AMMONIUM SULPHATE	13742	19793		
AMMONIUM NITRATE		10406		
UREA	38755	68550		
AMMONIUM PHOSPHATE	1768	738		
OTHER COMPLEX FERT	630	8978		
SURINAM				
NITROGENOUS FERTILIZERS	2300e	3700e	2500e	5800e
URUGUAY				
NITROGENOUS FERTILIZERS	11800	9600	15716	19600e
AMMONIUM SULPHATE	399	375		
AMMONIUM SUL NITRATE	70	182		
SODIUM NITRATE	27	35		
UREA	5520	3048		
AMMONIUM PHOSPHATE	2994	1996		
OTHER COMPLEX FERT	2790	3964		
VENEZUELA				
NITROGENOUS FERTILIZERS	32000e	13836	30080	59000e
AMMONIUM SULPHATE		2188	15320	
UREA			5143	
AMMONIUM PHOSPHATE		2263		
OTHER COMPLEX FERT		9385	9617	
ASIA				
NITROGENOUS FERTILIZERS	3494229	3574647	3317227	2938213
AFGHANISTAN				
NITROGENOUS FERTILIZERS	40000	12800	3173	5586
UREA	37000	10800		
AMMONIUM PHOSPHATE	3000	2000	3173	5586
BAHRAIN				
NITROGENOUS FERTILIZERS	16	20F	23	
BANGLADESH				
NITROGENOUS FERTILIZERS		65447	33263	5060
UREA		65447	33263	5060
BHUTAN				
NITROGENOUS FERTILIZERS		74	100e	100e
CHINA				
NITROGENOUS FERTILIZERS	1250000F	910000F	1188500F	758600F
CYPRUS				
NITROGENOUS FERTILIZERS	19645	7441	17600e	12000e
AMMONIUM SULPHATE	6307	1754		
AMMONIUM NITRATE	1811	3015		
UREA	1638	183		
OTHER NITROGEN FERT	9889	2489		
INDIA				
NITROGENOUS FERTILIZERS	660567	884751	950817	750100
AMMONIUM SULPHATE		48348	21177	
AMMONIUM NITRATE		93496	50492	
AMMONIUM SUL NITRATE		3510	2678	
UREA		572286	675786	
AMMONIUM PHOSPHATE		116128	132856	
OTHER NITROGEN FERT		7500		
OTHER COMPLEX FERT		43483	67828	
INDONESIA				
NITROGENOUS FERTILIZERS	2930000e	611000e	1590000e	11300e
IRAN				
NITROGENOUS FERTILIZERS	64073	117699	77650	42000e
AMMONIUM SULPHATE	1781	3855	5250	
UREA	44768	78503	59800	
AMMONIUM PHOSPHATE	15524	35341	12600	
IRAQ				
NITROGENOUS FERTILIZERS	3380	4560	900e	9200e
OTHER COMPLEX FERT	3380	4560	900e	9200e
ISRAEL				
NITROGENOUS FERTILIZERS	9215	2645	4710	
AMMONIUM SULPHATE	7350	2645	2880	
UREA	1865		1830	

	73/74	74/75	75/76	76/77
JAPAN				
NITROGENOUS FERTILIZERS	31000e	22500e	15000	39000
UREA				1000
OTHER COMPLEX FERT			15000	38000
JORDAN				
NITROGENOUS FERTILIZERS	1830	1990	1500e	3997
KAMPUCHEA DM				
NITROGENOUS FERTILIZERS	1000e	900e	100e	100e
KOREA DPR				
NITROGENOUS FERTILIZERS	40000e	24900e	7300e	
KOREA REP				
NITROGENOUS FERTILIZERS	6700e		9648	5100e
UREA			9648	5100e
LAO				
NITROGENOUS FERTILIZERS	100e	100e	100e	100e
LEBANON				
NITROGENOUS FERTILIZERS	38800	19120	5400e	16500e
MAL PENINSUL				
NITROGENOUS FERTILIZERS	48266	66618	39438	64424
MAL SABAH				
NITROGENOUS FERTILIZERS	2081	3178	1830	3340
UREA	624	1018	513	1000
AMMONIUM PHOSPHATE		21	3	
OTHER NITROGEN FERT	634	778	409	532
OTHER COMPLEX FERT	823	1361	905	1808
MAL SARAWAK				
NITROGENOUS FERTILIZERS	5300e	5500e	3643	5622
UREA			484	381
AMMONIUM PHOSPHATE			15	56
OTHER NITROGEN FERT			493	1227
OTHER COMPLEX FERT			2647	3958
MONGOLIA				
NITROGENOUS FERTILIZERS	1500	1600	1500	1300
NEPAL				
NITROGENOUS FERTILIZERS	8040	14488	1780	12193
AMMONIUM SULPHATE	2730	2205		457
UREA	920	9108	1380	8845
OTHER COMPLEX FERT	4390	3175	400	2891
OMAN				
NITROGENOUS FERTILIZERS	131	177	254	1300e
PAKISTAN				
NITROGENOUS FERTILIZERS	224498	129235	90585	118897
AMMONIUM SULPHATE	2090			
AMMONIUM NITRATE	9540	6170		
UREA	166142	93070	38447	45945
AMMONIUM PHOSPHATE	36686	1215	48547	52810
OTHER NITROGEN FERT	820	2250		
OTHER COMPLEX FERT	9220	26530	3591	20142
PHILIPPINES				
NITROGENOUS FERTILIZERS	94582	239440	44100	63200
AMMONIUM SULPHATE	21854	41527	6700	18000
AMMONIUM NITRATE	52	4500		
UREA	66539	150723	37400	45200
AMMONIUM PHOSPHATE	2467	4720		
OTHER NITROGEN FERT	3375	5970		
OTHER COMPLEX FERT	295	32000		
SAUDI ARABIA				
NITROGENOUS FERTILIZERS	4000e	5000e	2300e	1700e
SINGAPORE				
NITROGENOUS FERTILIZERS	1000e	1000e	1000e	1000e
SRI LANKA				
NITROGENOUS FERTILIZERS	49636	80604	34800e	47000e
AMMONIUM SULPHATE	19788	30345		
UREA	29383	43134		
OTHER COMPLEX FERT	465	7125		
SYRIA				
NITROGENOUS FERTILIZERS	23585	39091	16500	16500
AMMONIUM SULPHATE	8400	2000		
AMMONIUM NITRATE	15015	34535	16500	16500
OTHER COMPLEX FERT	170	2556		
THAILAND				
NITROGENOUS FERTILIZERS	52854	73123	74554	129700e
AMMONIUM SULPHATE	2185	5843	12555	
AMMONIUM NITRATE	1921	1286	1488	

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

IMPORTS — MT — IMPORTATIONS — MT — IMPORTACION — MT

	73/74	74/75	75/76	76/77
THAILAND CONT.				
SODIUM NITRATE		480		
CALCIUM NITRATE			362	
CALCIUM CYANAMIDE	75	75		
UREA	603	140	4371	
AMMONIUM PHOSPHATE	2336	5966	18965	
OTHER NITROGEN FERT	2342	32829	34122	
OTHER COMPLEX FERT	43392	26504	2691	
TURKEY				
NITROGENOUS FERTILIZERS	450700	106748	320667	600783 —
AMMONIUM SULPHATE	92500	38066	60834	101004
AMMONIUM NITRATE	90100	29942	113343	182728
UREA	89100	34657	146490	138471
AMMONIUM PHOSPHATE	46700	4083		92672
OTHER COMPLEX FERT	132300			85908
U A EMIRATES				
NITROGENOUS FERTILIZERS	495	638	800*	1000*
AMMONIUM SULPHATE	458	575	800*	1000*
UREA	10			
OTHER COMPLEX FERT	27	63		
VIET NAM				
NITROGENOUS FERTILIZERS	103300*	121200*	204000*	208000* —
YEMEN AR				
NITROGENOUS FERTILIZERS	735	600	3372	2700*
YEMEN DEM				
NITROGENOUS FERTILIZERS	200*	460	920	811
EUROPE				
NITROGENOUS FERTILIZERS	1925148	1623118	2051526	2165498
ALBANIA				
NITROGENOUS FERTILIZERS	100*	300*	400*	500*
AUSTRIA				
NITROGENOUS FERTILIZERS	420	317	1000*	2000*
CALCIUM NITRATE	11	9		
CALCIUM CYANAMIDE	409	308		
BELGIUM-LUX				
NITROGENOUS FERTILIZERS	118494	100894	131007	199000* —
AMMONIUM SULPHATE	7547	7376	8323	
AMMONIUM NITRATE	61388	59624	83454	
AMMONIUM SUL NITRATE	670	43	423	
SODIUM NITRATE	2654	2058	2254	
CALCIUM NITRATE	1955	2911	2656	
CALCIUM CYANAMIDE	150	72	90	
UREA	11025	5868	10745	
AMMONIUM PHOSPHATE	3852	865	3295	
OTHER NITROGEN FERT	10578	5433	5466	
OTHER COMPLEX FERT	18675	16644	14301	
BULGARIA				
NITROGENOUS FERTILIZERS	2700*			
CZECHOSLOVAK				
NITROGENOUS FERTILIZERS	75000	64000	47000	56711
DENMARK				
NITROGENOUS FERTILIZERS	271502	266518	249397	262698 —
AMMONIUM SULPHATE	628	588	839	1458
AMMONIUM NITRATE	8075	664	5266	19085
SODIUM NITRATE	1376	892	160	768
CALCIUM NITRATE	8339	8559	11786	6945
UREA	2201	125	444	2953
OTHER NITROGEN FERT	117079	102332	138472	126427
OTHER COMPLEX FERT	133804	153358	88430	105062
FINLAND				
NITROGENOUS FERTILIZERS	232	440		427
CALCIUM NITRATE	232	222		427
OTHER COMPLEX FERT		218		
FRANCE				
NITROGENOUS FERTILIZERS	386000*	257000*	476000*	496000* —
AMMONIUM SULPHATE	21757			
AMMONIUM NITRATE	92394			
SODIUM NITRATE	2579			
CALCIUM NITRATE	358			
CALCIUM CYANAMIDE	7906			
UREA	64290			
OTHER NITROGEN FERT	196716*			
GERMAN DR				
NITROGENOUS FERTILIZERS	237100	194400	111800	6000
GERMANY FED				
NITROGENOUS FERTILIZERS	216587	174698	305599	421573 —
AMMONIUM SULPHATE	26426	2014	18406	21933
AMMONIUM NITRATE	157754	126095	232053	310699
AMMONIUM SUL NITRATE	3243	9156	8963	10435

	73/74	74/75	75/76	76/77
GERMANY FED CONT.				
CALCIUM NITRATE	43	66	67	68
CALCIUM CYANAMIDE	1142	1075	5	
OTHER NITROGEN FERT	60	22	817	5447
OTHER COMPLEX FERT	27919	36268	45288	72991
GREECE				
NITROGENOUS FERTILIZERS	17500*	13000*	27900	15000
HUNGARY				
NITROGENOUS FERTILIZERS	132000*	146000*	110000*	104000* —
ICELAND				
NITROGENOUS FERTILIZERS	4649	5513	6251	4237
AMMONIUM SUL NITRATE	1			
CALCIUM NITRATE	7	8		
CALCIUM CYANAMIDE	10	8		4
OTHER COMPLEX FERT	4631	5497	6251	4233
IRELAND				
NITROGENOUS FERTILIZERS	56000*	59800*	60800*	90800*
ITALY				
NITROGENOUS FERTILIZERS	39333	25220	136491	83120
AMMONIUM SULPHATE	287	14	1916	3700
AMMONIUM NITRATE	4752	5298	8199	7330
SODIUM NITRATE		480		190
CALCIUM NITRATE		5	39	
CALCIUM CYANAMIDE	4133	6741	5896	5050
UREA	5926	5618	6462	9070
OTHER NITROGEN FERT	1450	289	44	120
OTHER COMPLEX FERT	22785	6775	111935	57660
MALTA				
NITROGENOUS FERTILIZERS	270	233	232	245
AMMONIUM SULPHATE	211	207	109	122
AMMONIUM NITRATE	49		87	87
OTHER NITROGEN FERT	10	26	36	36
NETHERLANDS				
NITROGENOUS FERTILIZERS	50605	23068	58855	95000*
AMMONIUM SULPHATE	4627	285	294	
AMMONIUM NITRATE	31973	15338	49597	
SODIUM NITRATE	3910	2100	3970	
CALCIUM CYANAMIDE	122	87	47	
UREA	2202	427	2183	
AMMONIUM PHOSPHATE	2812	1220	239	
OTHER NITROGEN FERT	112	95		
OTHER COMPLEX FERT	4847	3516	2525	
NORWAY				
NITROGENOUS FERTILIZERS		900*		
OTHER COMPLEX FERT		900*		
POLAND				
NITROGENOUS FERTILIZERS	6858	1441	6	10
PORTUGAL				
NITROGENOUS FERTILIZERS	10000*	5000*	10000*	2300*
SPAIN				
NITROGENOUS FERTILIZERS	15150	11806	13988	8377
AMMONIUM SULPHATE			2787	
AMMONIUM NITRATE			400	240
SODIUM NITRATE	4139	7303	6662	6943
CALCIUM NITRATE	6196	2635	3741	1194
UREA	988	1868		
OTHER COMPLEX FERT	3827		398	
SWEDEN				
NITROGENOUS FERTILIZERS	108798	107467	114800	117400 —
AMMONIUM NITRATE	16040	15917	21316	24170
SODIUM NITRATE	4790	4741	1918	2488
CALCIUM NITRATE	67145	66536	68910	65028
CALCIUM CYANAMIDE	32	42		
UREA	1314		230	2530
OTHER NITROGEN FERT	3054	1997	2304	2070
OTHER COMPLEX FERT	16423	18234	20122	21114
SWITZERLAND				
NITROGENOUS FERTILIZERS	15600	9100	15900	22100
AMMONIUM SULPHATE	1100	400	1500	2800
AMMONIUM NITRATE			600	1300
CALCIUM CYANAMIDE	2100	1500	1500	1500
UREA	8900	4300	8500	11000
AMMONIUM PHOSPHATE	600	300	300	400
OTHER COMPLEX FERT	2900	2600	3500	5100
UK				
NITROGENOUS FERTILIZERS	121200	113000	120000	136000 —
SODIUM NITRATE	300			
OTHER COMPLEX FERT	120900*			
YUGOSLAVIA				
NITROGENOUS FERTILIZERS	39050	43005	65900	42000

NITROGENOUS FERTILIZERS ENGRAIS AZOTES ABONOS NITROGENADOS

IMPORTS MT = IMPORTATIONS MT = IMPORTACION MT =

	73/74	74/75	75/76	76/77
YUGOSLAVIA CONT.				
AMMONIUM SULPHATE	37093	26015	13500	18000
AMMONIUM NITRATE		1890	10400	
UREA			18000	4300
OTHER NITROGEN FERT	1957	15100	24000	19700
OCEANIA				
NITROGENOUS FERTILIZERS	46845	32494	23928	42890
AUSTRALIA				
NITROGENOUS FERTILIZERS	50004	20004	2933	9287
FIJI				
NITROGENOUS FERTILIZERS	6798	9152	7200*	9000*
AMMONIUM SULPHATE	6798	9152	7200*	9000*
NEW ZEALAND				
NITROGENOUS FERTILIZERS	32447	17842	10295	20103
AMMONIUM SULPHATE	9329	5002	3213	8950
AMMONIUM NITRATE	313	253	444	658
SODIUM NITRATE	475	334	71	
CALCIUM NITRATE	153	63	41	58
UREA	21464	11423	5893	9620
OTHER NITROGEN FERT	713	767	633	817
PAPUA N GUIN				
NITROGENOUS FERTILIZERS	2600	3500*	3400*	4400*
SAMOA				
NITROGENOUS FERTILIZERS			100*	100*
USSR				
NITROGENOUS FERTILIZERS			7000*	
DEV.PEC M E				
NITROGENOUS FERTILIZERS	2551311	2416063	3018595	3844324
N AMERICA				
NITROGENOUS FERTILIZERS	994881	1130600	1166777	1752000
W EUROPE				
NITROGENOUS FERTILIZERS	1471390	1216977	1782720	1998277
OCEANIA				
NITROGENOUS FERTILIZERS	37447	19842	13228	29390
CTH DEV.PED				
NITROGENOUS FERTILIZERS	47593	48644	55870	64657
DEV.PING M E				
NITROGENOUS FERTILIZERS	3782781	4304480	3538724	3836808
AFRICA				
NITROGENOUS FERTILIZERS	267959	309135	313577	390602
LAT AMERICA				
NITROGENOUS FERTILIZERS	1089517	1157875	967730	1121093
NEAR EAST				
NITROGENOUS FERTILIZERS	969283	650260	801659	1094477
FAR EAST				
NITROGENOUS FERTILIZERS	1446624	2174558	1444658	1217136
CTH DV.PING				
NITROGENOUS FERTILIZERS	9398	12652	10700	13500
CENTR PLANND				
NITROGENOUS FERTILIZERS	1813558	1464741	1677606	1135221
ASIAN CPE				
NITROGENOUS FERTILIZERS	1359800	1058600	1401400	968000
E EUR+USSR				
NITROGENOUS FERTILIZERS	453758	406141	276206	167221
DEV.PED ALL				
NITROGENOUS FERTILIZERS	3005069	2822204	3294801	4011545
DEV.PING ALL				
NITROGENOUS FERTILIZERS	5142581	5363080	4940124	4804808

TABLE III.
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NITROGENOUS FERTILIZERS ENGRAIS AZOTES ABONOS NITROGENADOS

EXPORTS • MT N EXPORTATIONS MT N EXPORTACION MT .

	73/74	74/75	75/76	76/77
WORLD				
NITROGENOUS FERTILIZERS	8322607	8145566	7089477	8238200
AFRICA				
NITROGENOUS FERTILIZERS	33465	40000	37721	44900
ALGERIA				
NITROGENOUS FERTILIZERS		7900*	2000*	
IVORY COAST				
NITROGENOUS FERTILIZERS	4700*	1900*	921	900*
MOROCCO				
NITROGENOUS FERTILIZERS	1800*			1300
AMMONIUM PHOSPHATE	1800*			1300
RHODESIA				
NITROGENOUS FERTILIZERS	500*			
SENEGAL				
NITROGENOUS FERTILIZERS	3596	2200*	3000*	2700*
AMMONIUM PHOSPHATE	2210	1200F		
OTHER COMPLEX FERT	1386	1000F		
SOUTH AFRICA				
NITROGENOUS FERTILIZERS	22000*	26000*	31800*	37000*
TANZANIA				
NITROGENOUS FERTILIZERS	869	2000*		
OTHER COMPLEX FERT	869	2000*		
TUNISIA				
NITROGENOUS FERTILIZERS				3000*
N C AMERICA				
NITROGENOUS FERTILIZERS	1639721	1493859	1413662	1606230
CANADA				
NITROGENOUS FERTILIZERS	353000*	344000*	231194	406000*
COSTA RICA				
NITROGENOUS FERTILIZERS	19000*	15400*	13400*	17378
EL SALVADOR				
NITROGENOUS FERTILIZERS	5000*	2159	4495	7047
MEXICO				
NITROGENOUS FERTILIZERS	34821	9000*		
UREA	34821	9000*		
NETH ANTILLE				
NITROGENOUS FERTILIZERS	6600*	21200*	6300*	2500*
TRINIDAD ETC				
NITROGENOUS FERTILIZERS	70300*	88100*	34273	39305
AMMONIUM SULPHATE			8747	11440
UREA			25526	27865
USA				
NITROGENOUS FERTILIZERS	1151000	1014000	1124000	1134000
AMMONIUM SULPHATE	106000	109000	143000	94000
AMMONIUM NITRATE	11000	7000	19000	3000
SODIUM NITRATE		1000		
UREA	134000	188000	242000	154000
AMMONIUM PHOSPHATE	422000	443000	480000	556000
OTHER NITROGEN FERT	478000	266000	240000	327000
SOUTH AMERIC				
NITROGENOUS FERTILIZERS	67783	91801	75249	121255
BRAZIL				
NITROGENOUS FERTILIZERS	1300	301	1683	1404
AMMONIUM NITRATE	93			10
UREA	9		225	
AMMONIUM PHOSPHATE	1198	301	1458	1394
CHILE				
NITROGENOUS FERTILIZERS	66483	79300	55766	61882
COLOMBIA				
NITROGENOUS FERTILIZERS		7200*	14700*	3569
OTHER COMPLEX FERT		7200*	14700*	3569
VENEZUELA				
NITROGENOUS FERTILIZERS		5000*	3100*	54400*
ASIA				
NITROGENOUS FERTILIZERS	1738657	1856899	1228434	1225939
AFGHANISTAN				
NITROGENOUS FERTILIZERS				9200

	73/74	74/75	75/76	76/77
AFGHANISTAN CONT.				
UREA				9200
BURMA				
NITROGENOUS FERTILIZERS		6000*	3000*	2700*
UREA		6000*	3000*	2700*
CHINA				
NITROGENOUS FERTILIZERS	19000F	2700F		2200F
IRAQ				
NITROGENOUS FERTILIZERS	6810	7750		100*
AMMONIUM SULPHATE	2670	3150		
UREA	4140	4600		
ISRAEL				
NITROGENOUS FERTILIZERS	6475	7535	5010	3585
AMMONIUM SULPHATE	3765	4075	3670	2020
AMMONIUM NITRATE	320	705		
UREA	2345	2755	1340	1565
OTHER COMPLEX FERT	45			
JAPAN				
NITROGENOUS FERTILIZERS	1312300	1410400	851000	742000
AMMONIUM SULPHATE	176700	128200	140000	318000
AMMONIUM NITRATE		100		
CALCIUM CYANAMIDE	200	100		
UREA	974000	1127100	573000	325000
OTHER NITROGEN FERT	146800	136800	126000	92000
OTHER COMPLEX FERT	14600	18100	12000	7000
KOREA DPR				
NITROGENOUS FERTILIZERS		22800*	4500*	
KOREA REP				
NITROGENOUS FERTILIZERS	30000		8000*	46300*
UREA	25661			
OTHER COMPLEX FERT	4339			
KUWAIT				
NITROGENOUS FERTILIZERS	296700	273900	236600	246900
AMMONIUM SULPHATE	28200	21200	12600	2900
UREA	268500	252700	224000	244000
MAL PENINSUL				
NITROGENOUS FERTILIZERS	5672	5814	5538	2565
QATAR				
NITROGENOUS FERTILIZERS	1000*	40000*	79400*	107400*
UREA	1000*	40000*	79400*	107400*
SAUDI ARABIA				
NITROGENOUS FERTILIZERS	60700	80000*	35386	62989
UREA	60700	80000*	35386	62989
EUROPE				
NITROGENOUS FERTILIZERS	4450981	4176907	3908111	4701576
ALBANIA				
NITROGENOUS FERTILIZERS				200*
AUSTRIA				
NITROGENOUS FERTILIZERS	107110	80500	145000*	98000*
AMMONIUM NITRATE	64240	26700		
UREA	3350	1300		
OTHER COMPLEX FERT	39520	52500		
BELGIUM-LUX				
NITROGENOUS FERTILIZERS	549886	472769	519345	652000*
AMMONIUM SULPHATE	137515	91699	128392	
AMMONIUM NITRATE	155980	147669	157630	
AMMONIUM SUL NITRATE	69	323	134	
CALCIUM CYANAMIDE	4682	3975	2785	
UREA	31087	28727	64443	
AMMONIUM PHOSPHATE	33780	29035	20115	
OTHER NITROGEN FERT	29942	13936	16487	
OTHER COMPLEX FERT	156831	157405	129363	
BULGARIA				
NITROGENOUS FERTILIZERS	171000	218509	247313	261555
AMMONIUM SULPHATE		12493	12863	9296
AMMONIUM NITRATE		55608	34706	68770
SODIUM NITRATE		1080	730	636
UREA		149328	199014	182853
CZECHOSLOVAK				
NITROGENOUS FERTILIZERS	60000*	78400*	61400*	48000*

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

EXPORTS MT N — EXPORTATIONS MT N — EXPORTACION MT N

	73/74	74/75	75/76	76/77
DENMARK				
NITROGENOUS FERTILIZERS		1736	849	12571
AMMONIUM NITRATE				11793
OTHER COMPLEX FERT		1736	849	778
FINLAND				
NITROGENOUS FERTILIZERS	29329	1150	4137	2000
AMMONIUM SULPHATE		1150		
AMMONIUM NITRATE	6742			
UREA	12911		4137	
OTHER COMPLEX FERT	9676			2000
FRANCE				
NITROGENOUS FERTILIZERS	187406	278000*	196000*	155000*
AMMONIUM SULPHATE	1733			
AMMONIUM NITRATE	84256			
CALCIUM NITRATE	944			
UREA	32263			
OTHER NITROGEN FERT	595			
OTHER COMPLEX FERT	67615			
GERMAN DR				
NITROGENOUS FERTILIZERS	11700*	2000*	5600*	27500*
GERMANY FED				
NITROGENOUS FERTILIZERS	524182	388646	298232	384669
AMMONIUM SULPHATE	194260	189018	188149	181768
AMMONIUM NITRATE	139621	63849	39152	70339
AMMONIUM SUL NITRATE	29051	25558	15147	32628
CALCIUM NITRATE	414	731	1242	1106
CALCIUM CYANAMIDE	8939	9406	9338	8483
OTHER COMPLEX FERT	151901	100084	45204	90345
GREECE				
NITROGENOUS FERTILIZERS	53000*	8400	2874	29926
OTHER COMPLEX FERT	53000*	8400*	2874	29926
HUNGARY				
NITROGENOUS FERTILIZERS	17700*	24300*	21300*	60500*
IRELAND				
NITROGENOUS FERTILIZERS	15700*	13000*	7800*	8800*
ITALY				
NITROGENOUS FERTILIZERS	401347	468012	259094	315690
AMMONIUM SULPHATE	119543	123113	91455	147870
AMMONIUM NITRATE	41693	24168	9888	28170
AMMONIUM SUL NITRATE	1463			
CALCIUM NITRATE		50		
UREA	200877	271306	135640	104170
OTHER NITROGEN FERT	733	470	140	70
OTHER COMPLEX FERT	37038	48905	21971	35410
NETHERLANDS				
NITROGENOUS FERTILIZERS	908837	761665	827470	944000*
AMMONIUM SULPHATE	110621	53566	133771	
AMMONIUM NITRATE	145961	106606	101337	
CALCIUM NITRATE	11673	8626	5879	
UREA	410888	384301	385888	
AMMONIUM PHOSPHATE	10716	7017	2891	
OTHER NITROGEN FERT	51720	70936	87407	
OTHER COMPLEX FERT	167258	130613	110297	
NORWAY				
NITROGENOUS FERTILIZERS	362600	288400	252000	246800
CALCIUM NITRATE	93000	91700	89900	85000
UREA	46500	14500	35900	11600
OTHER NITROGEN FERT	58500	15900	14500	15800
OTHER COMPLEX FERT	164600	166300	111700	134400
POLAND				
NITROGENOUS FERTILIZERS	401479	384167	361493	374382
PORTUGAL				
NITROGENOUS FERTILIZERS	45000*	49500*	63000*	32400*
ROMANIA				
NITROGENOUS FERTILIZERS	434000*	447900*	500000	708000
SPAIN				
NITROGENOUS FERTILIZERS	18970	19426*	14751	95355
AMMONIUM SULPHATE	8509	7260	1351	
AMMONIUM NITRATE		268	12213	45499
AMMONIUM SUL NITRATE				7762
UREA			1161	33399
OTHER COMPLEX FERT	10461	11898*	26	8695
SWEDEN				
NITROGENOUS FERTILIZERS	15993	8669	11939	1328
AMMONIUM SULPHATE	107	144	484	558
AMMONIUM NITRATE	12204	8478	9111	736
UREA	262		2303	
OTHER COMPLEX FERT	3420	47	41	34

	73/74	74/75	75/76	76/77
UK				
NITROGENOUS FERTILIZERS	85000	131000	86000	193900*
YUGOSLAVIA				
NITROGENOUS FERTILIZERS	50742	50758	22510	49000
AMMONIUM NITRATE	11571	337	810	10300
UREA	9905	13090	3700	17700
OTHER COMPLEX FERT	29266	37331	18000	21000
OCEANIA				
NITROGENOUS FERTILIZERS	18000	23000	16000	4200
AUSTRALIA				
NITROGENOUS FERTILIZERS	18000*	23000*	16000*	4200*
USSR				
NITROGENOUS FERTILIZERS	374000*	463100	410300	534100
AMMONIUM SULPHATE	177800	179100	143900	185600
AMMONIUM NITRATE	21700	35200	36400	36800
UREA	174200*	248500	229600	311300
OTHER NITROGEN FERT	300	300	400	400
DEV.PED M E				
NITROGENOUS FERTILIZERS	6217877	5846566	4970009	5548224
N AMERICA				
NITROGENOUS FERTILIZERS	1504000	1358000	1355194	1540000
W EUROPE				
NITROGENOUS FERTILIZERS	3355102	3021631	2711005	3221439
OCEANIA				
NITROGENOUS FERTILIZERS	18000	23000	16000	4200
OTH DEV.PED				
NITROGENOUS FERTILIZERS	1340775	1443935	887810	782585
DEV.PING M E				
NITROGENOUS FERTILIZERS	615851	655124	507562	673539
AFRICA				
NITROGENOUS FERTILIZERS	11465	14000	5921	7900
LAT AMERICA				
NITROGENOUS FERTILIZERS	203504	227660	133717	187485
NEAR EAST				
NITROGENOUS FERTILIZERS	365210	401650	351186	426589
FAR EAST				
NITROGENOUS FERTILIZERS	35672	11814	16538	51565
CENTR PLANND				
NITROGENOUS FERTILIZERS	1488879	1643876	1611906	2016437
ASIAN CPE				
NITROGENOUS FERTILIZERS	19000	25500	4500	2200
E EUR+USSR				
NITROGENOUS FERTILIZERS	1469879	1618376	1607406	2014237
DEV.PED ALL				
NITROGENOUS FERTILIZERS	7687756	7464942	6577415	7562461
DEV.PING ALL				
NITROGENOUS FERTILIZERS	634851	680624	512062	675739

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

CONSUMPTION : MT N — CONSOMMATION : MT N — CONSUMO : MT N

	73/74	74/75	75/76	76/77
WORLD				
NITROGENOUS FERTILIZERS	38696869	38576569	43237983	45087934
AFRICA				
NITROGENOUS FERTILIZERS	1074514	1071196	1250906	1428158
ALGERIA				
NITROGENOUS FERTILIZERS	93500*	65100*	62800*	70000*
ANGOLA				
NITROGENOUS FERTILIZERS	9100	6500	2100*	1000*
BENIN				
NITROGENOUS FERTILIZERS	1300*	1341	791	1000*
BOTSWANA				
NITROGENOUS FERTILIZERS	1200*	1161	1500*	1000*
BURUNDI				
NITROGENOUS FERTILIZERS	228	601	329	300*
AMMONIUM SULPHATE	30	181		
AMMONIUM NITRATE	9	6	13	
UREA		233	195	
OTHER COMPLEX FERT	189	181	121	
CAMEROON				
NITROGENOUS FERTILIZERS	9326	9763	6100*	8400*
CAPE VERDE				
NITROGENOUS FERTILIZERS	28	23	50F	100*
CENT AFR REP				
NITROGENOUS FERTILIZERS	917	1800	600*	500*
CHAD				
NITROGENOUS FERTILIZERS	2212	4500*	2800*	3100*
CONGO				
NITROGENOUS FERTILIZERS	1200	200*	200*	300*
EGYPT				
NITROGENOUS FERTILIZERS	358161	360000*	415000	485000
AMMONIUM SULPHATE	70538	40000F	31000	36000
AMMONIUM NITRATE	161648	200000F	280000	327000
AMMONIUM SUL NITRATE	2			
CALCIUM NITRATE	1			
UREA	121078	120000F	104000	122000
OTHER NITROGEN FERT	64			
OTHER COMPLEX FERT	4830			
EQ GUINEA				
NITROGENOUS FERTILIZERS	100*	100*	100*	100*
ETHIOPIA				
NITROGENOUS FERTILIZERS	6074	7987	11000*	11000*
AMMONIUM SULPHATE	453	462		
AMMONIUM NITRATE	13			
UREA	1321	2403		
AMMONIUM PHOSPHATE	4097	3403		
OTHER COMPLEX FERT	190	1719		
GABON				
NITROGENOUS FERTILIZERS	21	30F	300*	300*
GAMBIA				
NITROGENOUS FERTILIZERS	302	400	165	200*
GHANA				
NITROGENOUS FERTILIZERS	2946	3782	11000*	12000*
AMMONIUM SULPHATE	1094	840		
UREA	9	92		
OTHER COMPLEX FERT	1843	2850		
GUINEA				
NITROGENOUS FERTILIZERS	800*	650	600*	600*
GUIN BISSAU				
NITROGENOUS FERTILIZERS	100*	317	100*	100*
IVORY COAST				
NITROGENOUS FERTILIZERS	7942	7799	10900	12000*
KENYA				
NITROGENOUS FERTILIZERS	20370	19400	21882	22417
AMMONIUM SULPHATE	2556	2300	2169	3045
AMMONIUM NITRATE		2900	6240	3500
AMMONIUM SUL NITRATE	4439	3100	2965	3900
CALCIUM NITRATE				155
UREA	1137	900	1056	1663
OTHER NITROGEN FERT	9228	7800	6420	5198
OTHER COMPLEX FERT	3010	2400	3032	4956
LESOTHO				
NITROGENOUS FERTILIZERS	135	136	300*	300*

	73/74	74/75	75/76	76/77
LIBERIA				
NITROGENOUS FERTILIZERS	2189	1200*	3056	4287
AMMONIUM SULPHATE	26		14	145
AMMONIUM NITRATE	1387		2880	3517
SODIUM NITRATE	234			
OTHER NITROGEN FERT	38		78	612
OTHER COMPLEX FERT	504		84	9
LIBYA				
NITROGENOUS FERTILIZERS	7000*	10100*	15000*	13100*
MADAGASCAR				
NITROGENOUS FERTILIZERS	4187	4980	3514	6000*
AMMONIUM SULPHATE	591	995	337	
AMMONIUM NITRATE	3			
UREA	2609	3557	2565	
AMMONIUM PHOSPHATE	8			
OTHER NITROGEN FERT	111			
OTHER COMPLEX FERT	865	428	212	
MALAWI				
NITROGENOUS FERTILIZERS	12442	7453	12888	10887
AMMONIUM SULPHATE	6846	4509	11205	12833
AMMONIUM NITRATE	2466	1614	1536	1573
SODIUM NITRATE	40			128
UREA	591	141	147	143
OTHER COMPLEX FERT	2499	1189		4200
MALI				
NITROGENOUS FERTILIZERS	5043	2947	1600*	4500*
MAURITANIA				
NITROGENOUS FERTILIZERS	174	198	1100*	900
MAURITIUS				
NITROGENOUS FERTILIZERS	11178	8674	10000*	11500*
AMMONIUM SULPHATE	5812	5900		
AMMONIUM SUL NITRATE	202	403		
AMMONIUM PHOSPHATE		1000		
OTHER NITROGEN FERT	5164	1371		
MOROCCO				
NITROGENOUS FERTILIZERS	62500*	62000*	63200*	82200*
MOZAMBIQUE				
NITROGENOUS FERTILIZERS	9000*	3700*	3700*	6700*
NIGER				
NITROGENOUS FERTILIZERS	220	81	277	548
AMMONIUM SULPHATE	1	19	98	99
UREA	161	51	163	414
OTHER COMPLEX FERT	58	11	16	35
NIGERIA				
NITROGENOUS FERTILIZERS	4700*	13200*	30200*	49300*
REUNION				
NITROGENOUS FERTILIZERS	6100*	3300*	3700*	4100*
RHODESIA				
NITROGENOUS FERTILIZERS	70000*	75000*	75000*	80000*
RWANDA				
NITROGENOUS FERTILIZERS	83	147	140	156
SENEGAL				
NITROGENOUS FERTILIZERS	7360	9000*	10000*	10800*
AMMONIUM SULPHATE	38	100F		
UREA	1650	2000F		
AMMONIUM PHOSPHATE	110	200F		
OTHER COMPLEX FERT	5562	6700F		
SIERRA LEONE				
NITROGENOUS FERTILIZERS	1135	1044	2200*	700*
SOMALIA				
NITROGENOUS FERTILIZERS	2100*	1900*	1840	
SOUTH AFRICA				
NITROGENOUS FERTILIZERS	231100*	230153	285316	304688
AMMONIUM SULPHATE	16500*	18271	19775	22862
AMMONIUM NITRATE	60800*	61304	81771	88079
UREA	32900*	35639	44266	34539
OTHER NITROGEN FERT	4300*	3762	3711	3732
OTHER COMPLEX FERT	116600*	111177	135793	155476
SUDAN				
NITROGENOUS FERTILIZERS	54693	60316	95000*	105000*
AMMONIUM SULPHATE	4200	2520	5150	
AMMONIUM NITRATE	13	20		
UREA	50480	57776	89850*	
SWAZILAND				
NITROGENOUS FERTILIZERS	5320	5300*	5500*	6000*

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

CONSUMPTION MT N — CONSOMMATION MT N — CONSUMO MT N

	73/74	74/75	75/76	76/77
SWAZILAND CONT.				
AMMONIUM SULPHATE	271			
AMMONIUM NITRATE	1056			
UREA	3092			
AMMONIUM PHOSPHATE	28			
OTHER NITROGEN FERT	873			
TANZANIA				
NITROGENOUS FERTILIZERS	11133	13944	14891	14500*
AMMONIUM SULPHATE	6069	9110	7875	
AMMONIUM NITRATE	823	1585	3021	
AMMONIUM SUL NITRATE	576			
UREA	918	1585	3021	
OTHER COMPLEX FERT	2747	1664	974	
TOGO				
NITROGENOUS FERTILIZERS	260	809	847	948
AMMONIUM SULPHATE	186			
UREA	23	308	322	
OTHER NITROGEN FERT	51	501	525	
TUNISIA				
NITROGENOUS FERTILIZERS	19059	22700	23380	24900*
UGANDA				
NITROGENOUS FERTILIZERS	4000*	1600*	872	963
AMMONIUM SULPHATE			105	63
AMMONIUM NITRATE			107	260
UREA			660	
OTHER COMPLEX FERT				640
UPPER VOLTA				
NITROGENOUS FERTILIZERS	356	700*	400*	2200*
ZAIRE				
NITROGENOUS FERTILIZERS	3200*	3100*	4968	6164
UREA	3200*	3100*	4968	6164
ZAMBIA				
NITROGENOUS FERTILIZERS	24000*	35900*	33700*	39800*
N C AMERICA				
NITROGENOUS FERTILIZERS	9732914	9388501	11218326	11595275
BAHAMAS				
NITROGENOUS FERTILIZERS	786	524	463	529
BARBADOS				
NITROGENOUS FERTILIZERS	2190*	1500*	1200*	700*
BELIZE				
NITROGENOUS FERTILIZERS	647	600*	800*	300*
CANADA				
NITROGENOUS FERTILIZERS	512641	531200	556200	609600
COSTA RICA				
NITROGENOUS FERTILIZERS	34000*	33900*	31100*	28488
CUBA				
NITROGENOUS FERTILIZERS	130400	139800	156300	187000
DOMINICAN RP				
NITROGENOUS FERTILIZERS	40625	46700	30000*	35000*
EL SALVADOR				
NITROGENOUS FERTILIZERS	68000*	62500*	65000*	77106
GUADELOUPE				
NITROGENOUS FERTILIZERS	4080*	2500*	3313	3353
AMMONIUM SULPHATE			11	52
AMMONIUM NITRATE			159	72
UREA			35	434
OTHER COMPLEX FERT			3108	2795
GUATEMALA				
NITROGENOUS FERTILIZERS	32000	36900	35100*	41000*
HAITI				
NITROGENOUS FERTILIZERS	700*	903	1200*	100*
AMMONIUM SULPHATE	100F	200		
UREA	350F	424		
OTHER COMPLEX FERT	250F	279		
HONDURAS				
NITROGENOUS FERTILIZERS	14000*	9500*	11400*	11000*
JAMAICA				
NITROGENOUS FERTILIZERS	8000*	9300*	6000*	7306*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]				
AMMONIUM SULPHATE			70	27
[illegible]			429	164

	73/74	74/75	75/76	76/77
MARTINIQUE CONT.				
OTHER COMPLEX FERT			1628	3033
MEXICO				
NITROGENOUS FERTILIZERS	525892	654395	833000*	891000*
AMMONIUM SULPHATE	122166	176372		
AMMONIUM NITRATE	58244	65597		
UREA	131181	166313		
AMMONIUM PHOSPHATE	20332	23714		
OTHER NITROGEN FERT	165496	182776		
OTHER COMPLEX FERT	28473	39623		
NICARAGUA				
NITROGENOUS FERTILIZERS	35000*	22000*	16500*	22800*
PANAMA				
NITROGENOUS FERTILIZERS	11805	13443	13416	11000*
ST KITTS ETC				
NITROGENOUS FERTILIZERS	200*	200*	300*	300*
ST LUCIA				
NITROGENOUS FERTILIZERS	1500*	1500*	1600*	1600*
ST VINCENT				
NITROGENOUS FERTILIZERS	1700*	1800*	2100*	2100*
TRINIDAD ETC				
NITROGENOUS FERTILIZERS	7000*	5466	4342	6000*
USA				
NITROGENOUS FERTILIZERS	8296928	7808770	9445300	9654300
AMMONIUM SULPHATE	175108	154778	199362	199785
AMMONIUM NITRATE	968988	860944	901125	852967
SODIUM NITRATE	6923	12294	9474	10687
UREA	424500	475528	661561	775951
AMMONIUM PHOSPHATE	108549	92483	91633	91633
OTHER NITROGEN FERT	6612860	6212743	7582141	7723277
VIRGIN IS US				
NITROGENOUS FERTILIZERS	400*	500*	700*	700*
SOUTH AMERIC				
NITROGENOUS FERTILIZERS	757190	828718	750705	943361
ARGENTINA				
NITROGENOUS FERTILIZERS	43843	42000*	28000*	39000*
AMMONIUM SULPHATE	10675			
AMMONIUM SUL NITRATE	1424			
SODIUM NITRATE	2283			
UREA	23630			
OTHER NITROGEN FERT	45			
OTHER COMPLEX FERT	5786			
BOLIVIA				
NITROGENOUS FERTILIZERS	2769	3800*	1600*	1300*
BRAZIL				
NITROGENOUS FERTILIZERS	347591	388709	387539	467026
AMMONIUM SULPHATE	113314	94654	101926	
AMMONIUM NITRATE	66677	84760	76278	
AMMONIUM SUL NITRATE	3666	8262		
SODIUM NITRATE	4472	4180	1624	
CALCIUM NITRATE	234			
CALCIUM CYANAMIDE	158	270		
UREA	68934	86454	75288	
AMMONIUM PHOSPHATE	83989	106376	130624	
OTHER NITROGEN FERT	2844	1379	1157	
OTHER COMPLEX FERT	3303	2394	642	
CHILE				
NITROGENOUS FERTILIZERS	59324	52079	38600	47546
AMMONIUM NITRATE	18			
SODIUM NITRATE	22753	22850	17823	
UREA	11090	11186	8277*	
AMMONIUM PHOSPHATE	18253	11120	7000*	
OTHER NITROGEN FERT	5			
OTHER COMPLEX FERT	7205	6923	5500	
COLOMBIA				
NITROGENOUS FERTILIZERS	129700	122700	111305	142740
AMMONIUM SULPHATE			1171	4678
AMMONIUM NITRATE			11847	7522
UREA			61687	90879
OTHER COMPLEX FERT			36600	39663
ECUADOR				
NITROGENOUS FERTILIZERS	28700*	22138	13549	35464
GUYANA				
NITROGENOUS FERTILIZERS	4246	1.200*	7103	4100*
PARAGUAY				
NITROGENOUS FERTILIZERS	1000*	800*	500*	700*
PERU				
NITROGENOUS FERTILIZERS	80492	113838	83549	100285

NITROGENOUS FERTILIZERS — ENGRAIS AZOTES — ABONOS NITROGENADOS

CONSOMMATION — IN T — CONSUMO — EN T

	73/74	74/75	75/76	76/77
PERU CONT.				
AMMONIUM SULPHATE	9173	19000	10833	8407
AMMONIUM NITRATE	21832	23200	23811	26549
UREA	46410	62000	42458	57419
AMMONIUM PHOSPHATE	1494	738	1117	3095
OTHER COMPLEX FERT	1583	8900	5330	4815
SURINAM				
NITROGENOUS FERTILIZERS	2300*	3700*	2500*	5800*
URUGUAY				
NITROGENOUS FERTILIZERS	15400	9900	11238	21300*
AMMONIUM SULPHATE	64			
AMMONIUM SUL NITRATE	128			
SODIUM NITRATE	21			
UREA	5241			
AMMONIUM PHOSPHATE	1943			
OTHER COMPLEX FERT	8003			
VENEZUELA				
NITROGENOUS FERTILIZERS	40811	57987	64822	74300*
AMMONIUM SULPHATE		8183	13300	
UREA		20808	23382	
AMMONIUM PHOSPHATE		3913	3132	
OTHER NITROGEN FERT		25083	25008	
ASIA				
NITROGENOUS FERTILIZERS	9488369	9146884	10248964	11166774
AFGHANISTAN				
NITROGENOUS FERTILIZERS	17700	24200	27668	30646
UREA	15000	20500	24258	25766
AMMONIUM PHOSPHATE	2700	3700	3410	4880
BAHRAIN				
NITROGENOUS FERTILIZERS	16	20F	23	
BANGLADESH				
NITROGENOUS FERTILIZERS	126953	82811	146723	165836
AMMONIUM SULPHATE	1853	887	1304*	1300F
UREA	125100	81924	145419	164536
BHUTAN				
NITROGENOUS FERTILIZERS		74	100*	100*
BURMA				
NITROGENOUS FERTILIZERS	36471	38142	42470	42931
UREA	36471	38142	42470	42931
CHINA				
NITROGENOUS FERTILIZERS	4015000F	4000000F	4360400F	4500300F
CYPRUS				
NITROGENOUS FERTILIZERS	19645	7441	15000*	15000*
AMMONIUM SULPHATE	6307	1754		
AMMONIUM NITRATE	1811	3015		
UREA	1638	183		
OTHER NITROGEN FERT	9889	2489		
INDIA				
NITROGENOUS FERTILIZERS	1829100	1766000	2149000	2457000
INDONESIA				
NITROGENOUS FERTILIZERS	350000*	345000*	341900*	351200*
IRAN				
NITROGENOUS FERTILIZERS	194080	188525	189980	203270
AMMONIUM SULPHATE	2566	4584	4200	4500
AMMONIUM NITRATE	5269	4872	6500	6950
UREA	135868	124430	126500	135350
AMMONIUM PHOSPHATE	50377	54593	52780	56470
OTHER NITROGEN FERT		46		
IRAQ				
NITROGENOUS FERTILIZERS	20139	27317	25000*	35000*
AMMONIUM SULPHATE	14480	17220		
UREA	2440	5980		
OTHER COMPLEX FERT	3219	4117		
ISRAEL				
NITROGENOUS FERTILIZERS	30340	32604	37375	37450
AMMONIUM SULPHATE	13365	15385	16860	15475
AMMONIUM NITRATE	475	505	670	
UREA	7465	5960	6965	7245
OTHER NITROGEN FERT	7290	8750	10760	12335
OTHER COMPLEX FERT	1745	2004	2120	2395
JAPAN				
NITROGENOUS FERTILIZERS	821200	690800	693000	736000
AMMONIUM SULPHATE	230100	187000	172000	205000
AMMONIUM NITRATE	17100	10300	11000	12000
CALCIUM CYANAMIDE	32200	29800	27000	30000
UREA	162200	129500	124000	135000
OTHER NITROGEN FERT	42100	40200	34000	36000
OTHER COMPLEX FERT	337500	294000	285000	318000

	73/74	74/75	75/76	76/77
JORDAN				
NITROGENOUS FERTILIZERS	1830	1990	1900*	3997
KAMPUCHEA DM				
NITROGENOUS FERTILIZERS	1000*	900*	100*	100*
KOREA DPR				
NITROGENOUS FERTILIZERS	244000*	251900*	264000*	270000*
KOREA REP				
NITROGENOUS FERTILIZERS	411236	447377	467678	361300
AMMONIUM SULPHATE		5214	15233	
CALCIUM CYANAMIDE	3678	730	24	
UREA	263270	323964	352831	
OTHER COMPLEX FERT	144288	117469	99590	
LAO				
NITROGENOUS FERTILIZERS	100*	100*	100*	100*
LEBANON				
NITROGENOUS FERTILIZERS	38600	19120	7000*	17700*
MAL PENINSUL				
NITROGENOUS FERTILIZERS	1048000*	602000*	721000*	835000*
MAL SABAH				
NITROGENOUS FERTILIZERS	2081	3178	1830	3340
UREA	624	1018	513	1000
AMMONIUM PHOSPHATE		21	3	
OTHER NITROGEN FERT	634	778	409	532
OTHER COMPLEX FERT	823	1361	905	1808
MAL SARAWAK				
NITROGENOUS FERTILIZERS	5300*	5500*	3643	5622
UREA			484	381
AMMONIUM PHOSPHATE			19	56
OTHER NITROGEN FERT			493	1227
OTHER COMPLEX FERT			2647	3958
MONGOLIA				
NITROGENOUS FERTILIZERS	1500	1600	1500	1300
NEPAL				
NITROGENOUS FERTILIZERS	9002	8961	8421	10687
AMMONIUM SULPHATE	3540	2822	1369	1670
UREA	3009	3296	4628	6284
OTHER COMPLEX FERT	2453	2843	2424	2733
OMAN				
NITROGENOUS FERTILIZERS	131	177	254	1300*
PAKISTAN				
NITROGENOUS FERTILIZERS	341944	362900	443451	500442
AMMONIUM SULPHATE	10710	13230	21764	27515
AMMONIUM NITRATE	7350	20400	21734	22095
UREA	300420	307840	352822	396904
AMMONIUM PHOSPHATE	21009	16170	38094	35339
OTHER NITROGEN FERT	80	230	1200	1116
OTHER COMPLEX FERT	2375	5030	7837	17473
PHILIPPINES				
NITROGENOUS FERTILIZERS	151902	177381	144100	177200
AMMONIUM SULPHATE	41219	38317	35400	36200
AMMONIUM NITRATE	52	494		
UREA	70373	97628	78000	103930
AMMONIUM PHOSPHATE	20653	19673	15200	19600
OTHER NITROGEN FERT	3375	1354		
OTHER COMPLEX FERT	16230	19915	15300	17500
QATAR				
NITROGENOUS FERTILIZERS			200*	300*
SAUDI ARABIA				
NITROGENOUS FERTILIZERS	4000*	5000*	5700	6415
SINGAPORE				
NITROGENOUS FERTILIZERS	1000*	1000*	1000*	1000*
SRI LANKA				
NITROGENOUS FERTILIZERS	51202	74400*	37800	47000*
AMMONIUM SULPHATE	19955			
UREA	20197			
OTHER COMPLEX FERT	1010			
SYRIA				
NITROGENOUS FERTILIZERS	33255	36624	39200	42500
AMMONIUM SULPHATE	6929	2456		
AMMONIUM NITRATE	22851	32575	39200	42500
AMMONIUM SUL NITRATE	1035	570		
OTHER COMPLEX FERT	2440	1023		
THAILAND				
NITROGENOUS FERTILIZERS	60212	79845	78852	135700*
AMMONIUM SULPHATE	7205	10278	15490	

	73/74	74/75	75/76	76/77
THAILAND CONT.				
AMMONIUM NITRATE	1921	1286	1488	
SODIUM NITRATE		480		
CALCIUM NITRATE			362	
CALCIUM CYANAMIDE	75	75		
UREA	2941	2427	5534	
AMMONIUM PHOSPHATE	7336	5966	18965	
OTHER NITROGEN FERT	2342	32829	34122	
OTHER COMPLEX FERT	43392	26504	2691	
TURKEY				
NITROGENOUS FERTILIZERS	429900	282899	482204	676527
AMMONIUM SULPHATE	85800	59040	79032	104572
AMMONIUM NITRATE	145100	153116	232097	304635
UREA	68900	47652	103525	127515
AMMONIUM PHOSPHATE	33700	23091	37367	93873
OTHER COMPLEX FERT	96400		30183	45932
U A EMIRATES				
NITROGENOUS FERTILIZERS	495	638	800*	1000*
AMMONIUM SULPHATE	458	575	800*	1000*
UREA	10			
OTHER COMPLEX FERT	27	63		
VIET NAM				
NITROGENOUS FERTILIZERS	133300*	121200*	194000*	241500*
YEMEN AR				
NITROGENOUS FERTILIZERS	735	600	3372	2700*
YEMEN DEM				
NITROGENOUS FERTILIZERS	200*	460	920	811
EUROPE				
NITROGENOUS FERTILIZERS	11202037	11237176	12242087	12455463
ALBANIA				
NITROGENOUS FERTILIZERS	36100*	36300*	36000*	45300*
AUSTRIA				
NITROGENOUS FERTILIZERS	132103	125553	121444	143269
AMMONIUM SULPHATE	860	670	697	709
AMMONIUM NITRATE	99254	96389	88828	95446
CALCIUM NITRATE	11	308	9	12
CALCIUM CYANAMIDE	409	298	280	258
UREA	533	510	403	522
OTHER COMPLEX FERT	31036	27378	31227	42322
BELGIUM-LUX				
NITROGENOUS FERTILIZERS	179225	185100	182000	190000*
AMMONIUM SULPHATE	4740	5092	5431	
AMMONIUM NITRATE	92598	104770	106183	
AMMONIUM SUL NITRATE	620	45	289	
SODIUM NITRATE	1863	1822	1928	
CALCIUM NITRATE	1354	1626	1796	
CALCIUM CYANAMIDE	5260	3100	3500	
UREA	3145	2513	2767	
AMMONIUM PHOSPHATE	3457	921	887	
OTHER COMPLEX FERT	66188	65211	59219	
BULGARIA				
NITROGENOUS FERTILIZERS	328057	329536	379572	348400
CZECHOSLOVAK				
NITROGENOUS FERTILIZERS	413000	428000	532000*	536204
DENMARK				
NITROGENOUS FERTILIZERS	365148	300445	339088	349497
AMMONIUM SULPHATE	635	559	942	969
AMMONIUM NITRATE	39923	25131	22540	33382
SODIUM NITRATE	1343	547	598	800
CALCIUM NITRATE	16020	10163	9896	7575
UREA	2602	127	949	2953
OTHER NITROGEN FERT	117243	104128	139432	127098
OTHER COMPLEX FERT	187382	159790	164731	176720
FINLAND				
NITROGENOUS FERTILIZERS	206660	226442	199315	161377
AMMONIUM SULPHATE	1497	22	65	40
AMMONIUM NITRATE	49201	56459	50628	37733
CALCIUM NITRATE	4448	3988	2910	1315
UREA	12676	15695	8127	6294
OTHER NITROGEN FERT	1525	1716	101	1395
OTHER COMPLEX FERT	137313	148562	137484	114600
FRANCE				
NITROGENOUS FERTILIZERS	1833083	1554800	1707800	1815000*
AMMONIUM SULPHATE	38796			
AMMONIUM NITRATE	784067			
SODIUM NITRATE	1611			
CALCIUM NITRATE	11619			
CALCIUM CYANAMIDE	2745			
UREA	48164			
OTHER NITROGEN FERT	185238			
OTHER COMPLEX FERT	760843			

	73/74	74/75	75/76	76/77
GERMAN DR				
NITROGENOUS FERTILIZERS	666100	671300	678000	754900
GERMANY FEC				
NITROGENOUS FERTILIZERS	1100841	1200939	1228142	1323051
AMMONIUM SULPHATE	38806	19924	31525	34727
AMMONIUM NITRATE	585624	652626	719403	767001
AMMONIUM SUL NITRATE	85943	95075	99491	95638
CALCIUM NITRATE	5142	4785	4656	4977
CALCIUM CYANAMIDE	63984	58055	54758	55016
OTHER NITROGEN FERT	3334	3377	4083	9158
OTHER COMPLEX FERT	318008	367097	313822	352539
GREECE				
NITROGENOUS FERTILIZERS	244293	251500	275080	291310
HUNGARY				
NITROGENOUS FERTILIZERS	492735	511298	535818	522414
AMMONIUM SULPHATE	6497	6656	7244	6918
AMMONIUM NITRATE	322321	329146	320592	306188
UREA	123706	144971	145251	144039
OTHER NITROGEN FERT	13892	30714	28380	29021
OTHER COMPLEX FERT	26319	39811	34271	36248
ICELAND				
NITROGENOUS FERTILIZERS	14145	13589	14761	14813
AMMONIUM NITRATE	2285	2755	3106	3178
CALCIUM NITRATE	7	4	5	5
CALCIUM CYANAMIDE	8	5	4	2
OTHER COMPLEX FERT	11845	10825	11646	11628
IRELAND				
NITROGENOUS FERTILIZERS	130200	133000	152739	168159
AMMONIUM SULPHATE	1477*	10929		
AMMONIUM NITRATE	53231*	70347*		
UREA	15417*	8817*		
OTHER COMPLEX FERT	60075*	52744*		
ITALY				
NITROGENOUS FERTILIZERS	672178	672195	724337	671290
AMMONIUM SULPHATE	114447	119185	97042	89000
AMMONIUM NITRATE	135910	155193	154245	155230
AMMONIUM SUL NITRATE	1972			
SODIUM NITRATE		297	75	
CALCIUM NITRATE	30920	22252	22501	19100
CALCIUM CYANAMIDE	2090	881	2845	2000
UREA	182022	181304	197005	214250
OTHER NITROGEN FERT	102	87		1650
OTHER COMPLEX FERT	204715	192996	250624	190060
MALTA				
NITROGENOUS FERTILIZERS	270	233	232	245
AMMONIUM SULPHATE	211	207	109	122
AMMONIUM NITRATE	49		87	87
OTHER NITROGEN FERT	10	26	36	36
NETHERLANDS				
NITROGENOUS FERTILIZERS	411974	434952	451175	430000*
AMMONIUM SULPHATE	2964	2470	3276	
AMMONIUM NITRATE	330243	357120	377545	
SODIUM NITRATE	3780	2030	3710	
CALCIUM NITRATE	12363	13493	13527	
CALCIUM CYANAMIDE	122	87	47	
UREA	2335	1845	1338	
AMMONIUM PHOSPHATE	1017	773	46	
OTHER NITROGEN FERT	2572	2385	2698	
OTHER COMPLEX FERT	56578	54749	48988	
NORWAY				
NITROGENOUS FERTILIZERS	85300	96200	97800	95000
AMMONIUM NITRATE	4100	4200		
CALCIUM NITRATE	7800	8800	7700	7700
UREA	400	700	200	300
OTHER NITROGEN FERT	100	300	300	500
OTHER COMPLEX FERT	72900	82600	89600	86500
POLAND				
NITROGENOUS FERTILIZERS	1073652	1142969	1227910	1213050
AMMONIUM SULPHATE	73328	90785	92197	92778
AMMONIUM NITRATE	710472	784816	825456	761955
SODIUM NITRATE	139	333	96	188
CALCIUM NITRATE	5111			
UREA	221753	182570	198560	240131
AMMONIUM PHOSPHATE	53196	46137	72584	78076
OTHER NITROGEN FERT	7425	6288	3423	3093
OTHER COMPLEX FERT	2228	32040	35394	36829
PORTUGAL				
NITROGENOUS FERTILIZERS	127722	126834	141000*	138100*
ROMANIA				
NITROGENOUS FERTILIZERS	442000	490000	788000	612000
SPAIN				
NITROGENOUS FERTILIZERS	728457	713755	722154	830394

NITROGENOUS FERTILIZERS ENGRAIS AZOTES ABONOS NITROGENADOS

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	73/74	74/75	75/76	76/77
SPAIN CONT.				
AMMONIUM SULPHATE	126477	92422	118501	108276
AMMONIUM NITRATE	280126	285077	303524	317361
AMMONIUM SUL NITRATE	51797	43329	59475	54110
SODIUM NITRATE	4837	3130	6451	5681
CALCIUM NITRATE	6217	2650	2664	2082
UREA	67873	84108	63437	114530
OTHER NITROGEN FERT	19989	18580	16610	18625
OTHER COMPLEX FERT	171141	184459	151492	209719
SWEDEN				
NITROGENOUS FERTILIZERS	263486	239336	258000	259100
AMMONIUM SULPHATE	443	324	330	183
AMMONIUM NITRATE	56777	58919	64706	64232
SODIUM NITRATE	4095	2984	3235	2643
CALCIUM NITRATE	78978	65896	73699	72350
CALCIUM CYANAMIDE	33	47		
UREA	12636	7515	5395	5830
OTHER NITROGEN FERT	5543	3657	3335	2672
OTHER COMPLEX FERT	104981	95994	107300	111190
SWITZERLAND				
NITROGENOUS FERTILIZERS	41500	37900	44300	50600
AMMONIUM SULPHATE	400		1000	2700
AMMONIUM NITRATE	21400	26000	26500	28900
CALCIUM NITRATE	1300	500	700	600
CALCIUM CYANAMIDE	2100	1500	1500	1500
UREA	6800	2300	8000	8200
AMMONIUM PHOSPHATE	200		300	400
OTHER NITROGEN FERT	3100	2100		
OTHER COMPLEX FERT	6200	5500	6300	8300
UK				
NITROGENOUS FERTILIZERS	874400	927000	1045000	1110000
YUGOSLAVIA				
NITROGENOUS FERTILIZERS	339408	352000	360000	382000
OCEANIA				
NITROGENOUS FERTILIZERS	217845	208094	187995	246903
AUSTRALIA				
NITROGENOUS FERTILIZERS	176000*	177600*	167000*	213300*
FIJI				
NITROGENOUS FERTILIZERS	6798	9152	7200*	9000*
AMMONIUM SULPHATE	6798	9152	7200*	9000*
NEW ZEALAND				
NITROGENOUS FERTILIZERS	32447	17842	10295	20103
AMMONIUM SULPHATE	9329	5002	3213	8950
AMMONIUM NITRATE	313	253	444	658
SODIUM NITRATE	475	334	71	
CALCIUM NITRATE	193	63	41	58
UREA	21464	11423	5893	9620
OTHER NITROGEN FERT	713	767	633	817
PAPUA N GUIN				
NITROGENOUS FERTILIZERS	2600	3500*	3400*	4400*
SAMOA				
NITROGENOUS FERTILIZERS			100*	100*
USSR				
NITROGENOUS FERTILIZERS	6224000	6696000	7339000	7252000
DEV.PEC M E				
NITROGENOUS FERTILIZERS	17851049	17076742	19218853	19998636
N AMERICA				
NITROGENOUS FERTILIZERS	8809569	8339970	10001500	10263900
W EUROPE				
NITROGENOUS FERTILIZERS	7750393	7587773	8064367	8423195
OCEANIA				
NITROGENOUS FERTILIZERS	208447	195442	177295	233403
OTH DEV.PEC				
NITROGENOUS FERTILIZERS	1082640	953557	975691	1078138
DEV.PING M E				
NITROGENOUS FERTILIZERS	6775374	6778824	7682210	8791830
AFRICA				
NITROGENOUS FERTILIZERS	423560	410627	440590	520370
LAT AMERICA				
NITROGENOUS FERTILIZERS	1680535	1877249	1967531	2274736
NEAR EAST				
NITROGENOUS FERTILIZERS	1180580	1025427	1324221	1640266
FAR EAST				
NITROGENOUS FERTILIZERS	3481303	3452869	3939168	4342958

	73/74	74/75	75/76	76/77
OTH DV.PING				
NITROGENOUS FERTILIZERS	9398	12652	10700	13500
CENTR PLANND				
NITROGENOUS FERTILIZERS	14070444	14721003	16336920	16297468
ASIAN CPE				
NITROGENOUS FERTILIZERS	4394800	4375600	4820200	5013200
E EUR+USSR				
NITROGENOUS FERTILIZERS	9675644	10345403	11516720	11284268
DEV.PEC ALL				
NITROGENOUS FERTILIZERS	27526693	27422145	30735573	31282904
DEV.PING ALL				
NITROGENOUS FERTILIZERS	11170176	11154424	12502410	13805030

APPENDIX C

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APPENDIX D

INDIVIDUALS AND ORGANIZATIONS CONTACTED

PART 1 - REGION I INTERVIEWS

(1)	Mr. Walter Willms	Willock Farms	Fort St. John, B.C.
(2)	Mr. Roy Schmelzer	United Grain Growers	"
(3)	-	Imperial Oil Agent	"
(4)	Mr. Larry Bomford	Min. of Agriculture	"
(5)	Mr. Ralph Kientz	Cargill	"
(6)	Mr. Ardin Hillman	Alberta Wheet Pool	Dawson Creek, B.C.
(7)	Mr. Harry Schmidt	Cargill	"
(8)	Mr. Gary Ward	Contract ammonia applicator to Alberta Wheat Pool	"
(9)	Mr. Peter Diemert	Imperial Oil Agent	"
(10)	Mr. Scott Young	Alberta Wheat Pool	Grande Prairie, Alta.
(11)	Mr. Chuck Stogan	Comino distributor	Sexsmith, Alberta
(12)	Mr. Ralph Balisky	Balisky Fertilizer	(near) Grande Prairie
(13)	Mr. John Neil	Imperial Oil Agent	Grande Prairie, Alta.
(14)	Mr. Ed Elkow	United Grain Growers	"
(15)	Mr. David Thompson	Alberta Agriculture	"
(16)	Mr. Douglas McKenzie	" "	Fairview, Alberta
(17)	Mr. Mike Rudakewick	" "	"
	Mr. Duane Lochhead	Lochhead Farms Ltd.	Hines Creek, Alberta
(18)	Dr. Arnold Henig	Beaver Lodge Research Station	Beaver Lodge, Alberta
	Dr. Paul Hoyt	" "	"
(19)	Mr. Jack Dobb	Min. of Agriculture	Dawson Creek, B.C.
(20)	Mr. Bunk Phizer	United Grain Growers	"
(21)	Mr. Daryl Peterson	South Peace Farms	Mile 26, B.C.
(22)	Mr. Larry Bomford	Min. of Agriculture	Fort St. John, B.C.
(23)	Mr. James Collins	Agriculture Consultant	"

PART 2 - REGION II INTERVIEWS

(24)	Mr. Noel Roddick	Noel Roddick Ltd.	Delta, B.C.
(25)	Mr. Don McLean	Green Valley Fertilizer & Chemical	Surrey, B.C.
(26)	Mr. Ron Bertrand	Min. of Agriculture	Cloverdale, B.C.
(27)	Mr. Helmut Ernt et al	" "	Kelowna, B.C.
(28)	Mr. Brian Meyers	Growers Supply	"
(29)	Mr. Bob France	Dist. Agriculturist	Vernon, B.C.
(30)	Mr. Reeber	Sunset Seed	Creston, B.C.
(31)	Mr. Bob Bourne	Alberta Wheat Pool	"
(32)	Mr. Art Clancy	Okanagan Fertilizers	Enderby, B.C.
(33)	Mr. Ted Moore	Asst. District Agriculturist	Kamloops, B.C.
(34)	Mr. Ed Berres	Buckerfields	"
(35)	Mr. Sandy McCurragh	Purity Feed	"
(36)	Mr. Jim Tingle	Field Crop Spec.	Prince George, B.C.
(37)	Mr. Bob Holtby	Consult, Agrologist	"
(38)	Mr. Evan Short	Spruce Capital Feeds	"
(39)	Mr. Frank Leslie	Crown Zellerbach	Coquitlam, B.C.
(40)	Mr. Barry Madu	Conair Aviation	Abbotsford, B.C.

(41)	Mr. Charlie Johnson	Ministry of Forests	Vancouver, B.C.
(42)	Mr. Dean Perch	Weyerhaeuser	Kamloops, B.C.
(43)	Mr. Dave Rawlings	Rayonier	Vancouver, B.C.
(44)	Mr. Brian McCutcheon	Tahsis Co.	Tahsis, B.C.
(45)	Mr. Stan Chester	Cdn. Forest Products	Vancouver, B.C.
(46)	-	Pacific Logging	Victoria, B.C.

PART 3 - REGION III INTERVIEWS & GENERAL CONTACTS

(47)	Mr. Bob Strand	Crown Zellerbach	Wilsonville, Oregon
(48)	Mr. Harry Anderson	Washington Dept. of Natural Resources	Olympia, Washington
(49)	Dr. Stan Gessel	U. of Washington	Seattle, Washington
(50)	Dr. G. Bengston	Oregon State Univ.	Corvallis, Oregon
(51)	Dr. Jim Beaton	Western Canadian Fertilizer Assoc. (Immediate Past President)	Calgary, Alberta
(52)	Mr. Ralph Bailey	Cominco	Calgary, Alberta
(53)	Mr. Richard Kendon	Western Co-operative Fertilizers Ltd.	"
(54)	Mr. J.R. Neal	Cdn. Fertilizer Inst.	Ottawa, Ontario
(55)	Japanese Trade Council		Vancouver
(56)	Don Waite	Dept. of Industry, Trade & Commerce, Chemical Division	Ottawa, Ontario
(57)	Denys C. Llyod	B.C. Research	Vancouver
(58)	Jim Taylor	Western Cnda. Fertilizer Ass.	Calgary, Alberta
(59)	John Petruic	President-elect WCFA	Calgary, Alberta
(60)	Dr. Ken Nielsen	Western Co-operative Fertilizers Ltd.	Calgary, Alberta
(61)	Bob Baptic	(Stats. Chairman WCFA) Cominco Ltd.	Winnipeg, Manitoba
(62)	Ken Motiuk	Statistician, Alta. Dept. of Agriculture	Edmonton, Alberta
(63)	Michael Clarke	B.C. Ministry of Econ. Dev.	
(64)	Hugh Bryce	Statistician, B.C. Ministry of Agriculture	
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