

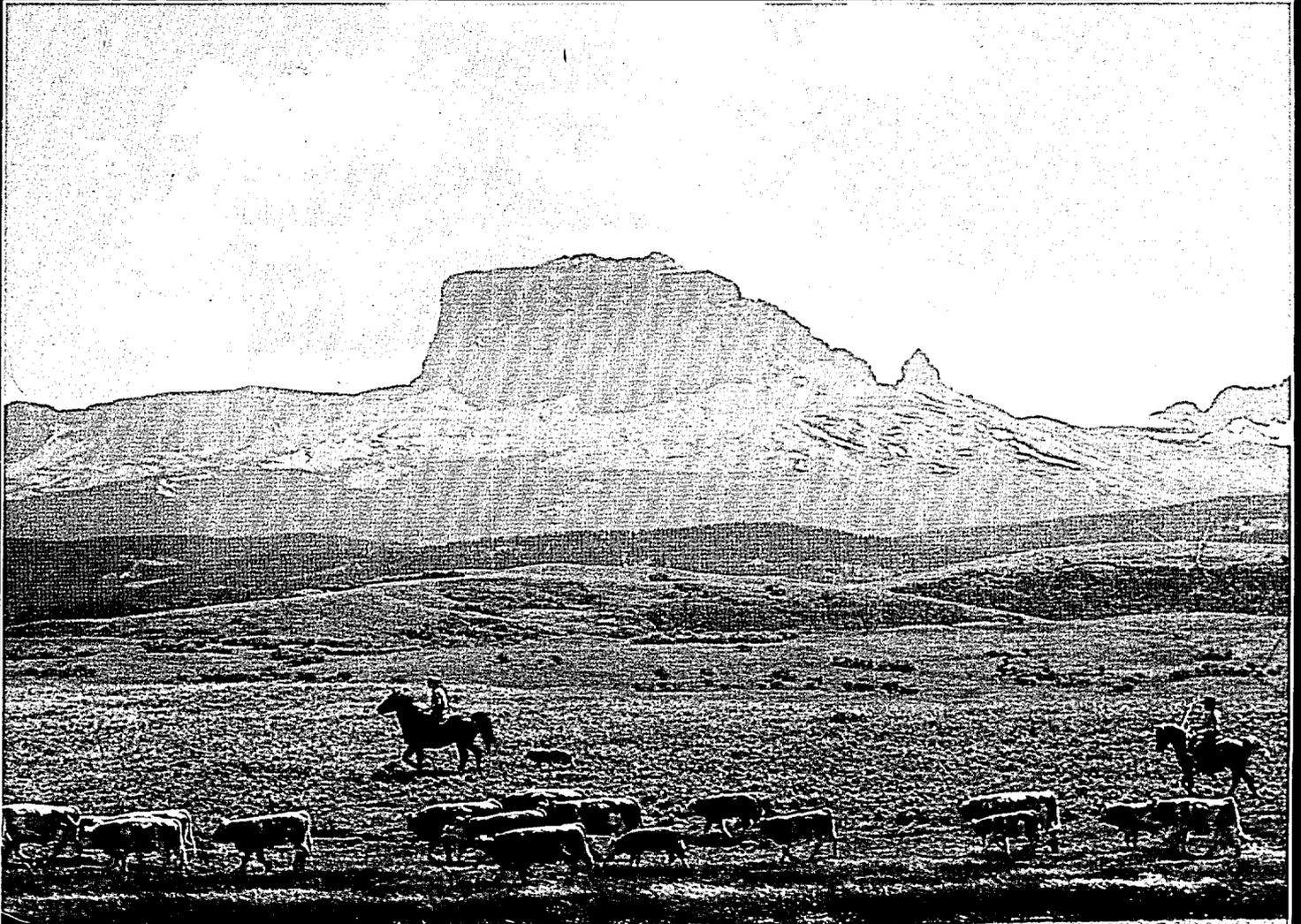
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THE INTERNATIONAL REFERENCE

CANADA'S AGRIBUSINESS

Blending Science and Nature



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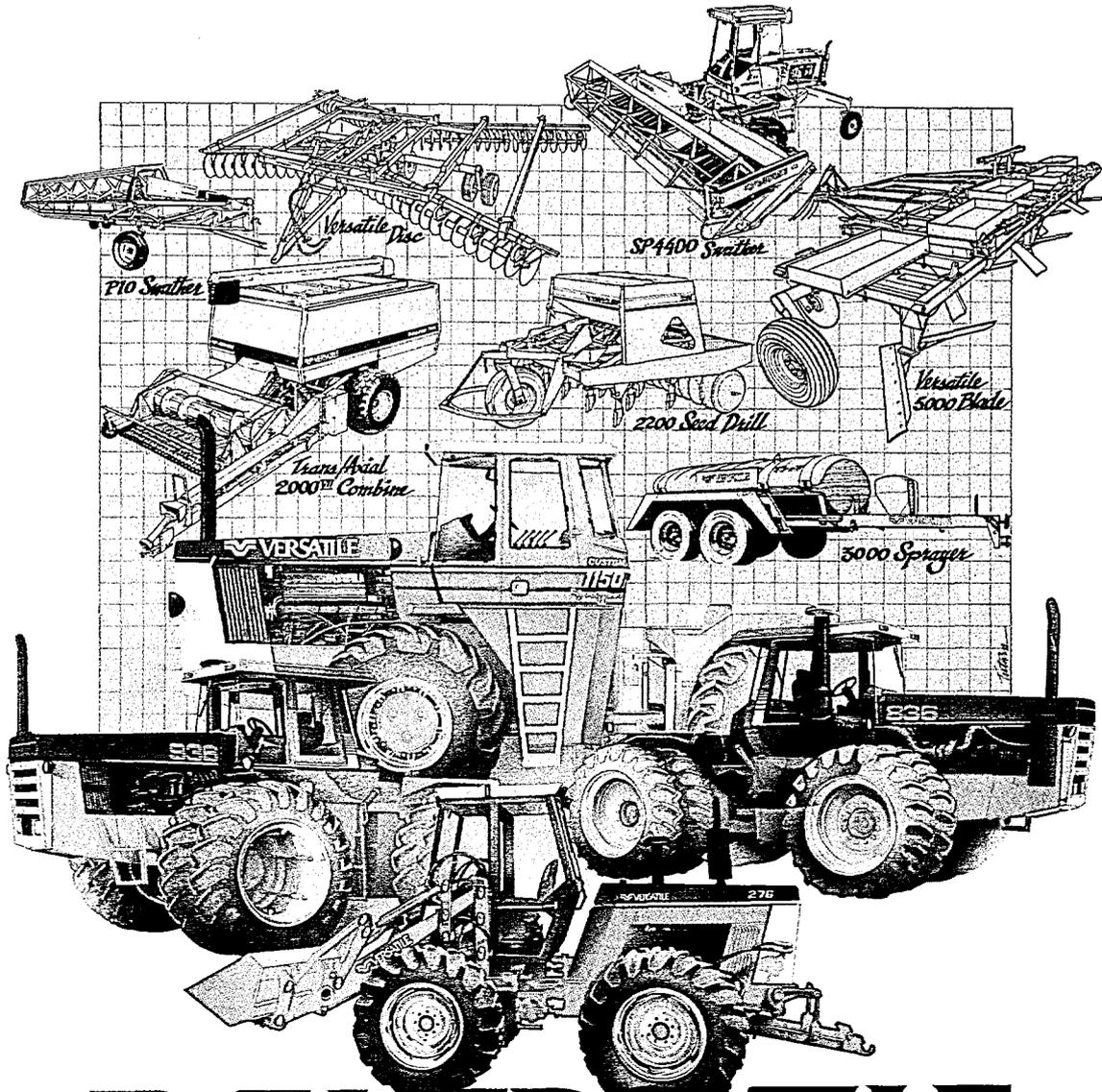
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We've got the best products on the market, the best dealers, and the best financing through Versatile Credit Corporation. Why are we the best? Because we're supplying some of the most demanding farmers anywhere. As long as you're happy, we know we're doing the right things. Because nobody is tougher to please, than you!

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**MESSAGE
FROM THE
HONOURABLE
PAT CARNEY,
MINISTER FOR
INTERNATIONAL
TRADE**



Pat Carney

It is a pleasure for me to say a few words on behalf of Canadian exporters of primary agricultural products, farm machinery and technical expertise. I believe you will find this publication a useful introduction to Canadian exporting capabilities in these areas.

Canada is one of the world's major exporters of primary agricultural products. We also manufacture some of the most reliable farm equipment available and are world leaders in the field of animal and plant genetic material.

Canadian exporters can provide the world with a wide range of high quality agricultural products, including horticulture and floriculture products, livestock, semen, embryos, seeds and plant stock, and feeds and feed formulations. In the advanced agricultural technology, equipment and services area, we produce long- and short-line implements and machinery, agrobiological and agrotechnological instrumentation and research equipment and animal and poultry housing and handling equipment.

Our hard won reputation in world markets is a credit to the many exporters who continue to satisfy their customers around the globe with competitive products delivered on time.

Canadian agricultural products and manufacturers, including those companies featured in this publication, are eager to serve you and I encourage you to contact them. For more information on Canada's primary agriculture and farm technology please contact the nearest Canadian Embassy or Consulate.

Pat Carney

Madam Minister, is agriculture important in Canada's export trade?

Yes, most definitely. Canadian exports of all agri-food products in 1985 were approximately \$9.5 billion, or about 8% of our total exports. Of that, grains and oilseeds account for over 50%, livestock and meat products about 18%, and processed foods, including beverages and feeds, about 22%.

Canada has a long-standing reputation around the world as a major supplier of high quality milling wheat; we are also a major exporter of other cereal grains, oilseeds and special crops, for example lentils and feed ingredients like dehydrated alfalfa.

Our animal breeding stock -- dairy, beef and swine -- also enjoy a reputation for high quality and productivity, thanks to our stringent national animal health programs. Canadian poultry breeding stock is also well known - and exported -- throughout the world.

While we have some established traditional trade in certain markets - forage seed, apples and white beans to the U.K., dairy cattle to Japan and South America, seed potatoes to Italy and Venezuela - there is a whole range of other perhaps lesser known products that appeal to buyers around the world: Canada exports blueberries to Japan, mushrooms to Germany, mustard seed to France, soybeans to Malaysia, goats to Brazil, dried peas and lentils to the Middle East.

And, I suppose that these exports help the Canadian economy?

That's true. These exports are very

INTERVIEW WITH THE HONOURABLE PAT CARNEY, MINISTER FOR INTERNATIONAL TRADE

important to our agricultural sector: they represented nearly 45% of total farm receipts in 1985, at almost \$10 billion. There are a lot of agri-food jobs that are dependent on these exports. That's why this government places a high priority on maintaining and enhancing our foreign markets.

We offer the quality that buyers are looking for, backed up by government inspection and grade standards, and advanced

production technology.

What about technology? Does it really play an important role?

It certainly does. Canadian grain production has always been efficient by world standards, but over the years, those producers, and the farm machinery industry that serves them, have developed new methods and equipment to improve their efficiency even further. As a result, Canada can



Minister for International Trade Pat Carney during a recent visit to Japan.

supply equipment particularly suited to the large scale farming regions of the world. Now, we're not only exporting food-stuffs, we're finding foreign markets for innovative machinery and processes based on Canadian know-how.

For example, Canadian-manufactured specialized farm equipment is now in use in Australia, Africa and the Middle East. Canadian research has developed improved varieties of wheat, early maturing soybeans and corn hybrids, and of course Canola, which is in strong demand in many countries, for edible oil uses. The superior milk producing qualities of our dairy cattle are the result of many years of selective breeding and improved feeding and management practices.

All this, plus our high quality standards produces the "winning combination" -- it has not just happened by accident!

Besides that "quality assurance", what support does the Canadian government offer to importers of Canadian products?

Our government is continually trying to increase the scope of Canada's foreign commercial relations. The Department of External Affairs has almost 500 trade commissioners stationed in embassies and consulates around the world and in Ottawa. These officers and their staff are in constant touch with potential Canadian suppliers and they can provide potential importers with full details on availability of Canadian agricultural products. Through these same officers we are continually organizing marketing missions and trade shows to introduce local importers and consumers to Canadian exporters and their products.

Our trade commissioners can assist buyers wishing to visit Canada and organize meetings with potential



The Pacific Rim countries constitute a significant market for Canadian agricultural products and services.

suppliers in all parts of Canada. Our trade commissioners are only a telephone or a telex away from specialists in Canada who are in regular contact with companies and producers in this sector and maintain comprehensive sourcing lists for all goods and services in the agricultural sector. They also have quick access to companies and research organizations using new process and production technology that may be of interest to foreign buyers.

Are there any priority markets?

All markets are important and we wouldn't want to limit ourselves to any particular ones. So you could say that in principle, our market strategy is to remain competitive in all markets.

But there are naturally some that warrant closer attention than others. The Pacific Rim countries - in particular Japan, South Korea and the People's Republic of China - show great promise. Other significant markets for our agricultural products and technology include Latin America and certain countries in North Africa and the Middle East.

Won't the competition for certain agricultural products increase in the future? How will Canada respond to that?

I am certain that agricultural markets will become more competitive. That process has been going on for some time. Some of the most determined competition will come from developing countries, which are aiming for an increased degree of self-sufficiency in food production. On first glance, that might mean a potential loss of market for us, but this can also mean new markets for Canada. For example, suppose that a country wants to increase its animal production -- it might look to Canada for improved seed varieties for higher crop productivity in forages or grains, to feed the livestock; or for animal genetics -- breeding stock semen or embryos -- to raise the productivity in that sector. We can help in both these areas, and of course with the technology and equipment that completes the "package", we are optimistic that Canada will continue to be a leader in the field of agri-food production and exports in the future. ■

**MESSAGE
FROM THE
HONOURABLE
MICHEL PAGÉ,
QUÉBEC
MINISTER OF
AGRICULTURE,
FISHERIES AND
FOOD**



*Michel Pagé
MNA Portneuf*

Over the years, Québec has succeeded in developing its agricultural know-how, which today it is happy to share with its economic partners.

Know-how whose effectiveness has already been proven, and whose unique nature is founded above all on ability to adapt to present-day needs.

Know-how marked by quality and vitality.

Know-how that has taken up every challenge put before it.

Today Québec is particularly proud of, among other achievements, the exceptional performance of its dairy herds, with respect as much to volumes of production as to a genetic value recognized around the world. Success in this area has been possible with the help of technology, research and management methods which Québec has developed and can now make available to well-informed, demanding clients.

The inventive spirit of the people of Québec is now ready to meet the challenge of excellence and efficiency in many other sectors of the agri-food industry.

Talk about agriculture with Québec's producers or industrialists, and you'll be talking with experts.

A handwritten signature in cursive script, appearing to read 'Michel Pagé'.

AGRICULTURE IN CANADA

5

There are four main types of farms in Canada. Livestock farms include those specializing in feedlot finishing of cattle, large-scale feeding of hogs bought as weanlings, dairying, poultry production for meat and eggs, and breeding and raising livestock. Grain farms produce such crops as wheat, oats, flax and canola. Special crop farms produce vegetables, fruits, potatoes or other root crops and, to a lesser extent, tobacco or forest products. Other farms combine livestock and grain production. Although each region of Canada has its specialties, none is limited to one type of farming.

The Atlantic Region

This area includes Newfoundland, Prince Edward Island, Nova Scotia, New Brunswick and the Gaspé district of Québec. It is hilly, with a general covering of relatively fertile soil developed under forest cover. The climate is modified by the sea, but also affected by cold currents from the coast of Labrador and winds from the north. Precipitation averages 760 to 1,400 millimetres annually. Mixed farming is general and forage crops support a healthy livestock industry.

Nova Scotia's main agricultural areas surround the Bay of Fundy and Northumberland Strait where they are protected from Atlantic gales. Dairying and poultry production are common and beef farming has increased in recent years. The Annapolis Valley is famous for fruit, particularly apples. New Brunswick produces potatoes and livestock in the Saint John River Valley and there is mixed farming in the northwest. More than a third of the commercial farms in the province are dairy farms.

Climate, soil conditions and geography have combined to form several distinct farming regions in Canada. A harsh northern climate restricts most agriculture to the southern portion of the country and nearly all farms lie within 483 kilometres of the southern border. In the Atlantic provinces and Central Canada farming is limited to coastal regions and river valleys, and soils vary in depth and fertility. In the Prairie

region soil is fertile but rain is light. Farming is linked to high plateaus and river valleys in the western mountainous region.

Farming is a key business in Canada. Approximately 65.9 million hectares in ten provinces are cultivated. In 1986, farm cash receipts exceeded \$20.5 billion and agricultural exports of major commodities reached the \$8.8 billion mark.



A historical photograph of farming in Canada.

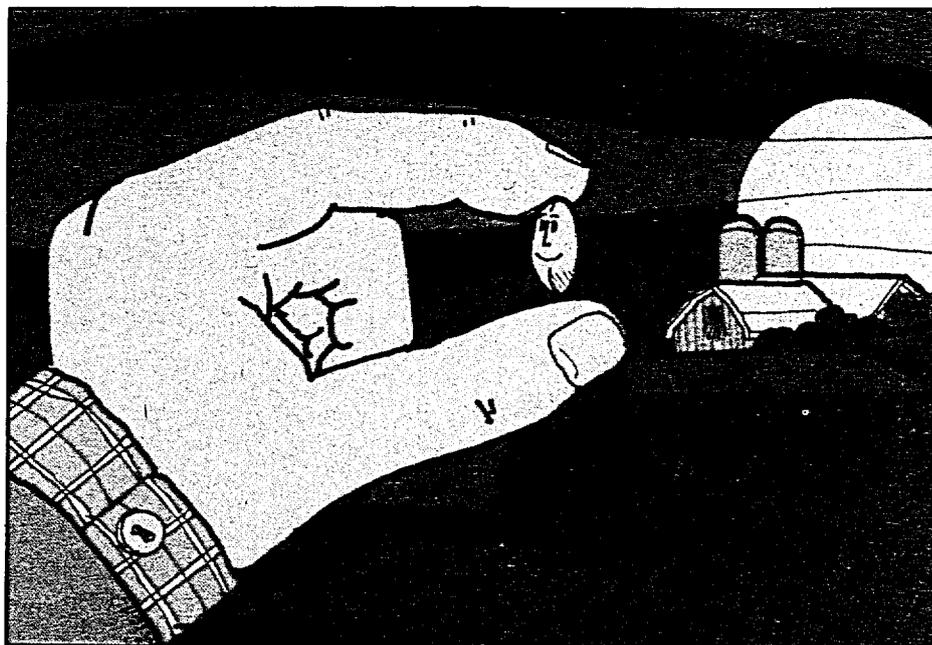
Farming is the principal occupation on Prince Edward Island. Potatoes are the leading crop and are recognized for their superior quality throughout the world. The Island's fertile land also supports mixed grains, dairying and other livestock enterprises. Small fruits and vegetables are produced as well.

In Newfoundland agriculture is of only local importance because of rough terrain. However, bogland offers some potential for reclaiming and vegetable farming.

The Central Region

This lowland area bordering the St. Lawrence River includes the Ottawa Valley and extends through Southern Ontario to Lake Huron. Fertile soils, mostly formed by glacial drift and lake sediment developed under deciduous forest cover, and a relatively mild climate modified by the Great Lakes and the St. Lawrence River, account for varied agricultural activity. Precipitation averages 760 to 1,140 millimetres a year. This is also the most densely populated part of the country, providing large markets for farm produce.

Well over half the commercial farms of Québec are now dairy farms. Large butter and cheese industries rely on these farms for primary products. Livestock farms, specializing in beef cattle, swine and sheep, and mixed farms are common, and poultry and egg production is increasing. Forage crops account for the largest cultivation and oats and corn are produced for feed. Fruits, particularly apples, and vegetables are becoming prime crops. Sugar beets and flue-cured tobacco are also grown and processed.



Ontario has specialized crops in more southerly regions and the largest number of commercial livestock farms, and is second in dairy farms. Forage crops are the largest cultivated crops; others are corn, mixed grains, winter wheat, oats and barley.

Dairy farms are concentrated in Middlesex, Oxford and Perth counties in southwestern Ontario, in the Bruce Peninsula and in the eastern counties. Beef is a specialty in Lake Huron and Georgian Bay areas. Sheep, poultry and swine production is widespread. Ontario is a major producer of apples and the Niagara Peninsula accounts for most of Canada's tender tree fruits and grapes. Vegetables are grown near most large centres. Maple syrup has traditionally been a major sideline for farmers in Ontario and Québec.

The Prairie Region

Manitoba, Saskatchewan and Alberta contain three-quarters of the farmland in Canada. Precipitation that averages only 330 to 510 millimetres a year and a climate of cold winters and short, hot summers favours the production of high quality hard red spring wheat, by far the largest

single crop produced here. Rangeland and pasture support a large number of cattle, and livestock rearing in general is a major industry.

Manitoba has the highest rainfall of the three provinces and an average of one hundred frost-free days, resulting in more varied farming. Wheat and other grains predominate but canola is also grown, and there is mixed farming with an emphasis on livestock. Vegetables, sugar beets and sunflowers are grown south of Winnipeg and processed locally. Dairy farms are common around Winnipeg; swine production and sheep farms are widespread and beef cattle are raised in the southwest.

Saskatchewan grows about two-thirds of all Canada's wheat and large quantities of other grains, aided by light spring rainfall and long sunny days. Canola is a popular crop and irrigation assists vegetables and forage crops. Mixed farming is common in the north where rainfall is higher, and turkey farming as well as egg and broiler chicken production is increasing. Swine and cattle are gaining in importance.

Alberta is second to Saskatchewan in grain production but has more beef cattle than any other province. These are concentrated in large ranches in the south and the Rocky Mountain foothills. Cattle-feeding operations are expanding and Alberta is a leading producer of swine and sheep. Irrigation in the south aids in producing canning crops, sugar beets and forage crops. Dairy and poultry products are prominent in the mixed-farm sector. In the northwest the Peace River district produces grain and livestock.

The Pacific Region

The most westerly region, British Columbia, is covered largely by mountains and forests. Only 2% of the area is agricultural. There is no single regional climate; the Pacific

Coast has mild temperatures and high rainfall; the interior has moderate temperatures with parts as dry as the Prairies; and the central interior, although a little cooler, has fairly high precipitation. Farms tend to be small and highly productive and are concentrated in the south-central mainland and southern Vancouver Island.

Livestock and dairying account for the greatest part of British Columbia's agricultural production. Swine and beef cattle are raised on many farms, beef particularly in the central and southern interior areas. Dairying and poultry meat and egg production are concentrated in the lower Fraser Valley where the population is large. Mixed farming is scattered throughout the province.

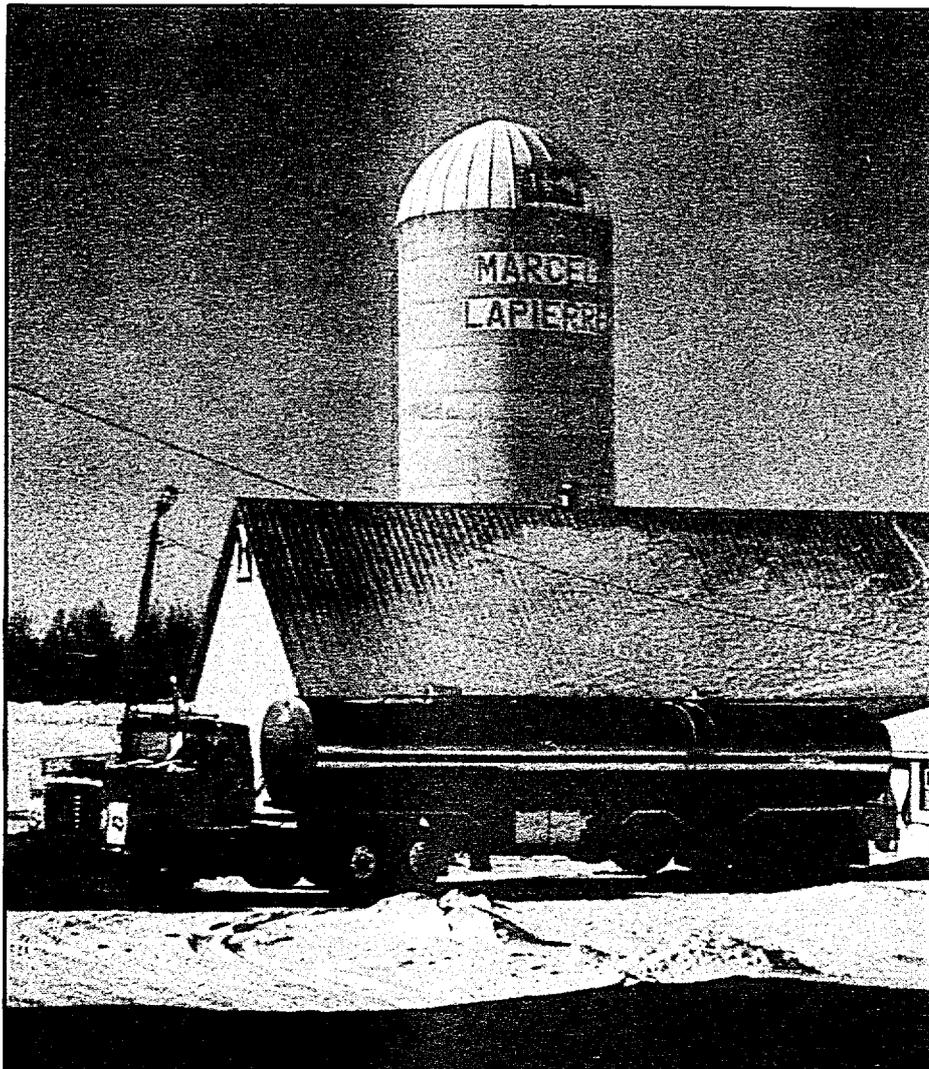
British Columbia is Canada's largest producer of apples. The Okanagan Valley is also noted for tree fruits such as peaches, plums and cherries. Raspberries and strawberries are grown in the Fraser Valley and on Vancouver Island along with other horticultural crops -- apricots, grapes, tomatoes, sweet corn and potatoes. Vancouver Island's mild climate also produces flowering bulbs.

The Northern Region

The agricultural region north of latitude 55° consists of parts of northern British Columbia, Yukon, and the Mackenzie River Valley in the Northwest Territories. The North is estimated to have 1.2 million hectares of potentially arable land and large expanses of grazing land. The number of commercial farms found here is low, however, their activity is centered on dairy products, beef cattle, forage crops, feed grains and vegetables.

The Challenge of the Future

Agriculture in Canada is facing its greatest challenge ever. The 20th century has seen more change in agriculture than any other period in history. During the first half of this century, mechanical technology significantly altered our methods of farming. From the early 1950s to the mid-80s, the use of chemical fertilizers and crop protectants brought even greater changes to agriculture. We are currently witnessing the beginning of the era of biotechnology. This period, which will continue into the next century, will have an unprecedented significance and effect on agriculture. As in the past, Canada continues to take a leadership role in the development of agriculture and agriculture-related industries. ■





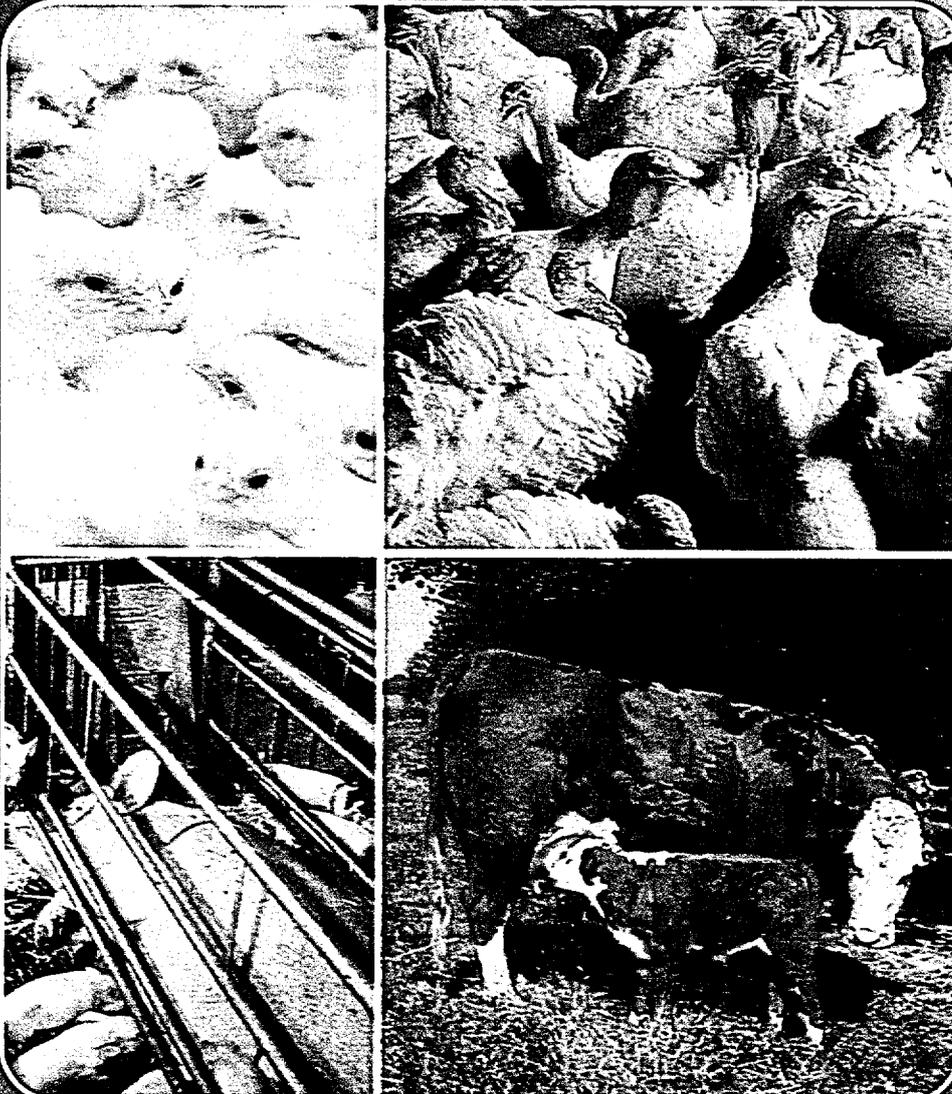
ONTARIO

World Class Livestock Industry

Ontario is a world leader in the production of poultry, swine, cattle and equine breeding stock. Ontario is globally renowned in embryo transplant and artificial insemination technologies. The high quality genetic material from Canadian purebred stock is used to upgrade herds worldwide.

Ontario is also a leader in the production of animal health products, livestock feeds as well as grain and forage seeds. Whatever your livestock needs, look to Ontario for the right solution.

For more specific information on Ontario agricultural products, contact either the Toronto office or an agriculture and food representative in one of the foreign offices.



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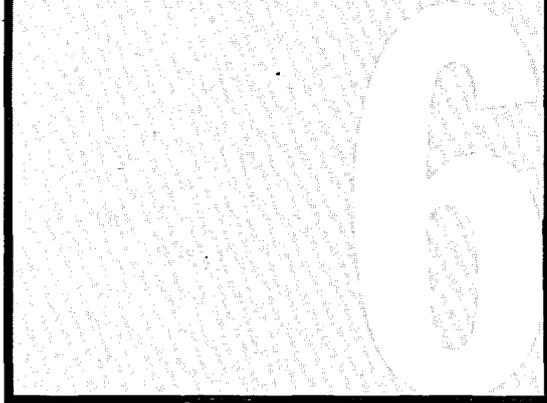
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CANADA'S BEEF AND DAIRY CATTLE



Livestock production is becoming increasingly important to the Canadian export industry. In 1986, the export of live animals from Canada to countries in all parts of the world contributed \$435 million to the economy. In addition, semen exports accounted for \$15 million in revenue.

Canada is known around the world for the quality of its livestock, its computerized herd improvement programmes, and the research and technology it has applied to genetic engineering, embryo transplant techniques and artificial insemination.

The constant search for superior

livestock bloodlines has kept Canadian farmers among the most efficient and competitive in the world.

The federal government's Record of Performance (ROP) Program has been helping farmers identify the country's top-producing animals since 1905. A great many Canadian herds are registered for record-of-performance testing. This allows selection to be made on the basis of pedigree, appearance and performance. In addition, Canada's performance-testing programs help maintain national standards and allow intercommunication between the various computerized recording systems.

Agriculture Canada computers offer farmers an accurate assessment of each animal's genetic value and with this information, the Department's geneticists are able to provide an accurate "estimated breeding value" for an animal before it is even born.

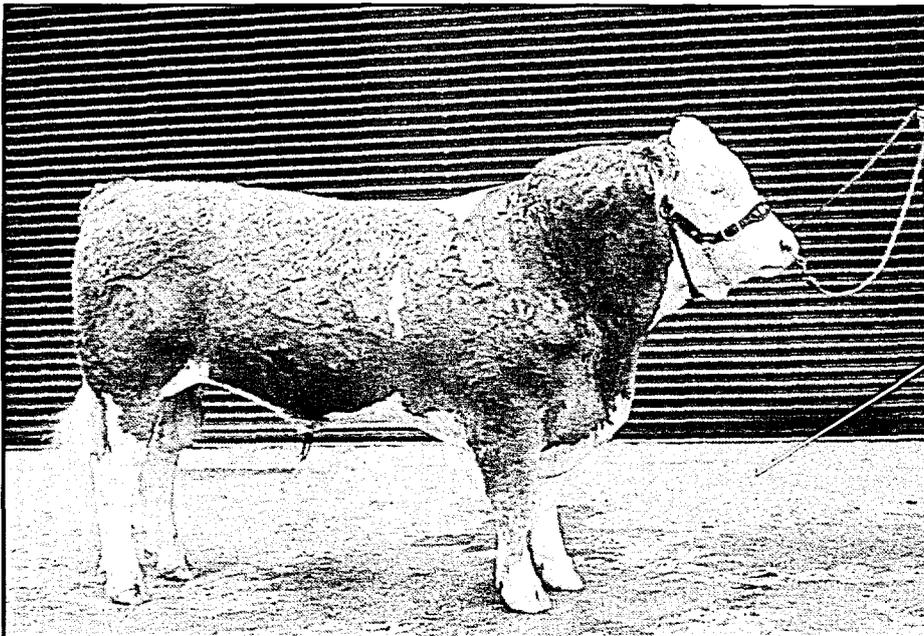
Canadian Beef Cattle Breeds

Canadian beef cattle breeds are generally characterized by outstanding beef carcasses, leanness, consistently superior meat and high dressing percentage. Canada also has an international reputation for quality beef breeding stock known for hardiness, adaptability to diverse climatic and foraging conditions, high fertility records, easing calving and good milk production.

The most widely recognized beef breeds are the Hereford, Aberdeen-Angus, Shorthorn, Charolais and Simmental breeds.

A wide range of cross-bred cattle for beef breeding and slaughter are also available in Canada. The result of the best breeding stocks and best feeds, these animals are available in lots pre-sorted for colour, age,

Canadian Herefords have been exported to Japan, the People's Republic of China, the U.S. and several other countries.



conformation and breed. Although virtually any breed-cross can be found, the primary crosses are: Hereford and Aberdeen Angus; Charcross (Charolais crossbreeds); and Simmental and Hereford.

The Hereford breed was first imported into Canada in 1860. This hardy animal adapts well to extremes in temperature and environment. Through selective breeding and record keeping, the Canadian Hereford has become a trait leader and positive influence on the beef industry in many foreign countries. Growth, ease of maintenance and profitability have made the Hereford attractive to export buyers from the United States, Europe, Japan, the People's Republic of China, Russia, Australia and several other countries.

Canadian Dairy Cattle Breeds

By using the most advanced scientific methods available, Canada dairymen have devoted special attention to developing the following features in Canadian dairy breeds: good size, healthy feet and legs, well-shaped udders, normal teat arrangement, marked suitability for machine milking, early maturity with high initial performance and excellent fattening ability at all ages. Stamina, fertility, longevity, and wide-ranging adaptability to a great variety of feeding and stabling conditions are advantages specific to most Canadian dairy cattle breeds.

Canadian Holsteins have established a solid worldwide reputation for their superior characteristics, extraordinary adaptability and milk-producing efficiency. South Korea and the United States are the breed's major markets, but they have also been imported into Argentina, Australia,

Saudi Arabia, West Germany and several other countries. The distribution of Canadian Holstein semen is even more widespread.

The Brown Swiss, a breed that is considered one of the purest of all recognized dairy cattle breeds, was imported into Canada in 1888 and almost immediately, breeders began concentrating efforts on improving the breed's milk production potential. Rapid growth, ruggedness and long milking lifetimes and good salvage value make the Brown Swiss popular on a wide range of export markets.

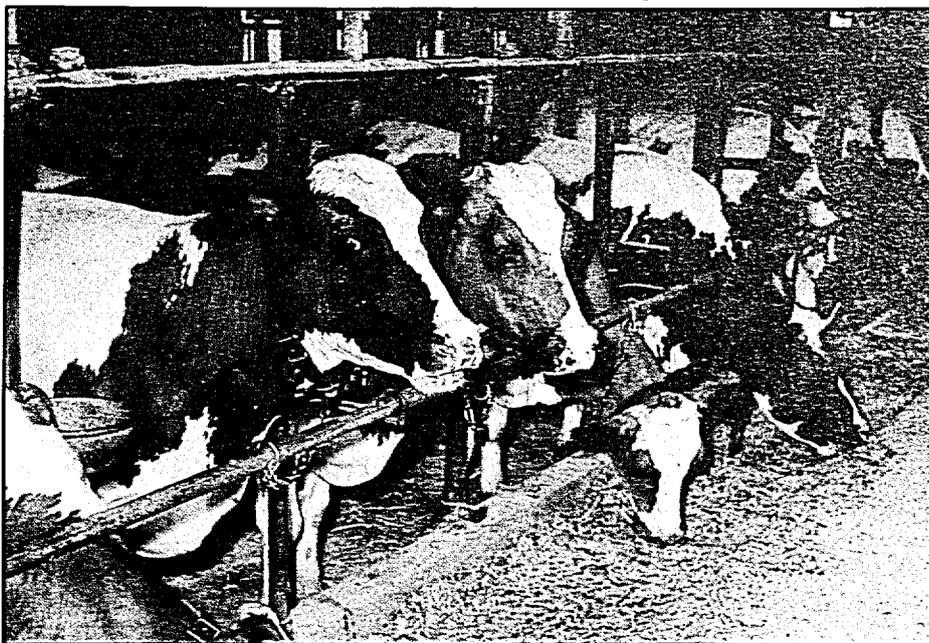
Breed Associations

Canadian breed associations and provincial associate organizations play a key role in ensuring that Canada preserves its worldwide reputation for superior breeding stock. They do so by: fostering the development and regulation of breeds in Canada; keeping records of the breed and origin of cattle and

collecting, preserving and publishing data and documents relating to these factors; establishing breed standards and carrying out a system of registration and recording under the Canadian National Livestock Records system; assisting breeders engaged in propagation and breeding of cattle in compliance with the Livestock Pedigree Act or any regulation made thereunder; maintaining an efficient supervision of breeders to prevent, detect and punish fraud; compiling industry statistics and furnishing official and authentic information in regard thereto; exercising the power to make all needful contracts and agreements and making, altering and repealing regulations.

More information on the beef or dairy cattle industry in Canada may be obtained by contacting the Canadian breed associations listed in the directory section of this publication. Enquiries may also be directed to the nearest Canadian consulate or embassy. ■

Canadian dairy cattle breeds, such as the Ayshire, have a solid reputation worldwide.



THE CANADIAN SWINE INDUSTRY

7

The five major breeds of the Canadian swine industry are the Yorkshire, Landrace, Duroc, Hampshire and Lacombe. Also of importance are Berkshires, Chester Whites, Large Blacks, Tamworths, Spotted Poland Chinas, British Saddlebacks and Managra.

Each breed has its own performance characteristics in

terms of litter size, growth rate and feed conversion efficiency, and yields a carcass unique in structure and composition. In most modern enterprises, some set and repeatable combination of these breeds is used to achieve maximum efficiency in live performance and to produce carcasses that best suit the market served. The objective of the purebred industry is to provide

these enterprises with high performance breeding stock that will reproduce predictably - whether used in a single-bred or crossbreeding programme.

The Yorkshire breed is the most numerous in Canada. It is noted for its prolificacy and efficient food conversion. Good Yorkshire brood sows consistently farrow more than ten pigs per litter. In certain strains, Canadian breeders have produced a more heavily muscled animal selected on the basis of loin and ham weight.

The Landrace has been developed in Canada since its introduction since 1950. It is used extensively as a crossing breed and is noted as a bacon pig; the carcass is lean with a high proportion of ham.

The Duroc Jersey is a meat-type animal noted for its carcass characteristics and feed efficiency. It has strong feet and legs making it an excellent choice for rugged, commercial-feeding conditions. The Duroc is also noted for large litters, a characteristic retained even when used in a crossbreeding programme.

Worldwide efforts to produce lean pork have placed emphasis on the Hampshire as a crossing breed. When half-Hampshire boars are used in a final cross, there is evidence of superior carcass quality in the offspring.

The Lacombe was developed in Canada. As the breed was developed, selections from each generation were based on litter size, weaning weight, growth rate, and carcass quality. Above-average performance in growth and carcass of the parents, litter mates or the individual animal is a requirement for registration of Lacombe pigs. Rapid growth rate and high lean content characterize the progeny for crossing Lacombe with other breeds. ■



GENETIC ENGINEERING

Canada's livestock production technology has long been recognized as among the most advanced in the world. This has resulted in a high demand for genetically superior Canadian breeding material on international export markets. In particular, Canadian exports of cattle in the form of live animals, semen and frozen embryos and exports of poultry breeding stocks represent export revenue of between \$50 and \$100 million annually. In fact, one of every three Leghorn laying hens in the Western world today is Canadian-bred; and Canadian Holsteins are recognized throughout the world as being among the most productive and efficient milk-producing breeds.

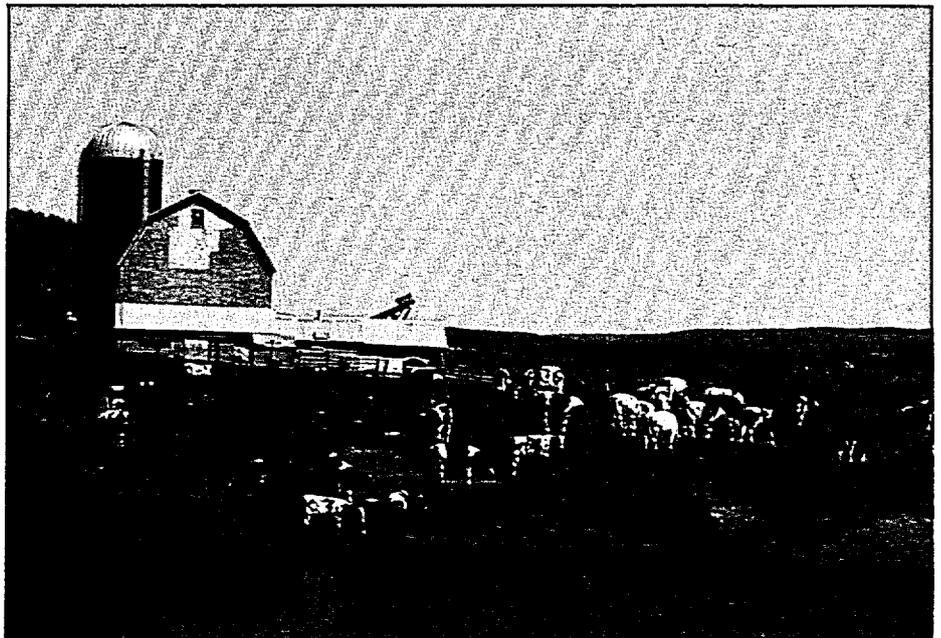
The adaptation and application of modern technological advances to animal production by several private industry concerns in Canada has resulted in the development of highly successful embryo manipulation techniques (superovulation, embryo collection, embryo freezing and splitting, etc.) to supply genetic material to both domestic and foreign markets.

Alberta Livestock Transfers of Calgary, Alberta, is one of the first companies in the world to successfully use embryo manipulation technology in practical industry applications. The company has developed substantial export markets for frozen embryos.

Other Canadian companies successfully using the above techniques for the manipulation of the reproductive process in cattle are **Eastern Breeders** of Kemptville, Ontario; **Western Breeders** of Woodstock, Ontario; and **United Breeders** of Guelph, Ontario.

Superovulation and embryo transfer programs are also successfully applied by Canadian field veterinarians. For example, such cooperative efforts in this direction are commonly undertaken by Québec veterinarians and the **University of Montréal St. Hyacinthe Veterinary College**, St. Hyacinthe, Québec. Currently, the possibilities of further developing this technology and its industrial application are being actively explored.

Research on the manipulation of the reproductive process is now underway at the **University of Calgary, Alberta**, in conjunction with **Alta Genetics (Alberta)**. Research is concentrated on the development of cloning as a method of capitalizing on outstanding animals, as a tool in conventional livestock improvement and to combine desirable traits from other breeds or species in transgenic animals. Similar complementary work is



Genetic engineering is an important complement to conventional livestock improvement techniques.

also being carried out at Agriculture Canada's **Animal Research Centre (ARC)** in Ottawa, at the **University of Guelph**, Guelph, Ontario and the **University of Montréal St. Hyacinthe Veterinary College**, **Western College of Veterinary Medicine**, Saskatoon, Saskatchewan and others.

These technological advances have at least two major applications in the field of animal production. One such application is genetic engineering of rumen bacteria, a second is molecular genetics and genetic engineering of livestock.

Bacteria that live in one part of the complex stomach of ruminants (cattle, sheep, etc.) are essential for the digestion and utilization of the fibrous feeds (hay, straw, silage) that ruminants eat. These bacteria are then digested further down the tract, serving as a source of protein to the animal. However, the composition of these bacterial proteins that eventually are digested by the animal is not optimal in terms of the nutritional (amino acid) requirements of the ruminant. In Canada, genetic engineering work on rumen bacteria is now underway and is expected to provide the possibility to ensure adequate supply of necessary amino acids, thus reducing or eliminating the need for costly grain and other protein supplements in ruminant rations.

Genetic manipulation of rumen bacteria to improve their ability to degrade fibrous foodstuffs is also being explored. Research being carried out in this area at Agriculture Canada's **ARC** appears to be the most advanced anywhere in the world and has the potential for industrial application within the next five to ten years. It may, for example, generate a new industry to produce and distribute the engineered bacteria to livestock producers as it is anticipated that the rumen microflora may need to be periodically re-seeded with such



Canadian Holsteins are recognized throughout the world as being among the most productive and efficient milk-producing breeds.

micro-organisms. Related work in this area is also underway at the **University of Guelph** in cooperation with the **ARC**.

Another crucial area of technology affecting livestock production is molecular genetics and genetic engineering of livestock species. The utilization of growth hormone in milking cows shows potential to increase milk production significantly. Related research is in progress at the **Lennoxville Research Station** of Agriculture Canada and at several Canadian universities. Development of DNA assays to determine the genotype of cattle for milk proteins is underway at the **ARC** and related work is also being carried out at **McGill University's Macdonald College**. Because the milk protein genotype influences both milk production and cheese quality, the new assays would allow selection in the desirable direction of both milk yield and quality. Identification of other genes directly related to important production parameters is also being investigated currently.

Successful gene transfers in livestock have been carried out at the **University of Calgary** and research on the utilization of transgenic animals in livestock

improvement is in progress at the **ARC**.

Studies of the molecular and cellular genetics of chickens, aimed at improvement of genetic resistance to disease, are well advanced at the **ARC**, in close cooperation with Agriculture Canada's **Animal Diseases Research Institute**, located in Ottawa, and **McGill University's Macdonald College**. For example, these studies deal with genes that are a permanent component of the animal's genetic make-up and whose function is to produce "endogenous" viruses. Reduction or elimination of such genes may improve productivity and health of poultry and livestock species.

Overall, in Canada application of new technologies to livestock production has had a remarkably successful start and, in the case of embryo manipulation, has already produced a significant industry impact. Other areas are approaching points of relatively widespread industrial application and provide extraordinary potential.

A long-established mainstay of the world's livestock industry, Canada is moving confidently into the future. ■

ANIMAL HEALTH CARE

Canada, with its reputation as a producer and exporter of high quality livestock, also claims a substantial share of international markets for new animal health care products. The federal government's National Biotechnology Strategy, formulated in 1983, identified animal health care as a high potential area. Its goal was to develop an internationally competitive Canadian animal health care industry by increasing technological capability and research activity in government, university and private industry, especially in recombinant DNA and monoclonal antibody technologies. Notable progress has been achieved, partly due to increased opportunities for communication within this industry sector and a greater number of cooperative research and development efforts. The annual meetings of Bionet, the animal and human health care network, provide the opportunity for discussion and exchange of information on topics including government research programmes, funding agencies, venture capital, the university/industry/government interface, patenting and copyrighting, and regulatory issues. Bionet membership is approximately 280, with 45% of members coming from industry, 27% from universities and 27% from government.

Recently reported Canadian research and product development activities in animal health care include the following examples, just a few among many significant advances attributable to Canada's scientists.

Diagnostic Reagents

Monoclonal antibody (MCAB) and/or enzyme-linked immunoassay (ELISA) technologies for diagnosis of brucellosis, pseudorabies, rabies, salmonellosis and campylobacteriosis are currently being developed in Agriculture Canada's Animal Pathology Division. Some are joint undertakings with university or private laboratories, supported by

the National Research Council and other agencies. MCAB-based diagnostic kits recently developed by Canadian companies, either alone or in cooperation with other institutions, include tests for detection of rotaviruses associated with calf scours. New ELISA tests include a test for bovine leukosis and one for swine transmissible gastroenteritis.

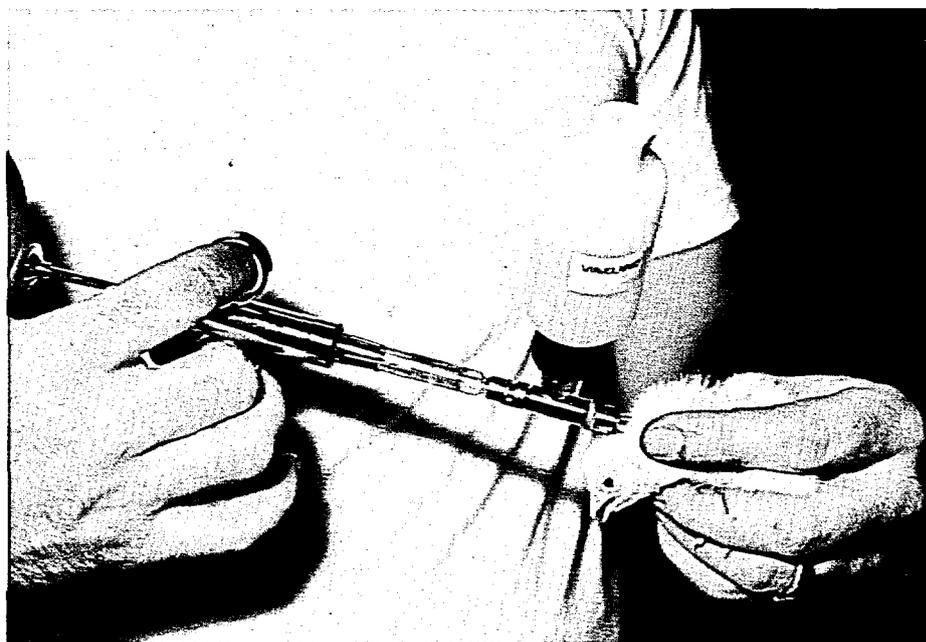


Advances are also being made in diagnostic technologies based on DNA probes. These will be particularly useful for diagnosis of viral infections, especially exotic or highly infectious viruses which require high security laboratory conditions. DNA probes are under development for exotic viruses such as bluetongue and pseudorabies, indigenous viruses (e.g. paroviruses) and bovine viruses which may be transmitted by embryo transfer techniques.

New technologies for preparation of improved antigens for diagnosis of diseases, including brucellosis, leukosis and paratuberculosis, are being developed by scientists at Agriculture Canada, the National Research Council and Institut Armand Frappier (Montréal, Québec) and other institutions across Canada.

Disease Prevention

The use of genetically-engineered bovine interferon for prevention and control of respiratory disease in cattle is currently undergoing trials at the Veterinary Infectious Disease Organization, VIDO, (Saskatoon, Saskatchewan). Work



is also underway on the use of MCABs for prevention of calf scours.

Promising new genetically engineered viral vaccines include the vaccinia-based live recombinant rabies vaccine currently under evaluation in a cooperative project involving Agriculture Canada scientists, the Ontario government,

the Wistar Institute (U.S.A.) and the Institut Merieux (France). Vaccines to protect calves from scours caused by rota and corona viruses are being tested at VIDO, supported by the university-industry programme of the Natural Sciences and Engineering Research Council. Recombinant DNA techniques are also being used to develop live attenuated bacterial vaccines, including one for bovine salmonellosis.

Replacing cumbersome, expensive and sometimes hazardous technologies, these products will have very large international markets and will improve the ability to detect, diagnose and control infectious disease problems.

The level of interest in the animal health care sector in Canada is ever-increasing and Canadian scientists look forward to sharing their accomplishments in this area with agricultural markets throughout the world. ■



THE CANADIAN SEED INDUSTRY

Canada has one of the world's largest plant breeding capacities. This includes a large, public contribution to plant breeding, in addition to similar efforts by several private firms who are members of the Canadian Seed Trade Association (CSTA).

Canada's national seed regulations are recognized worldwide. Exacting standards for trueness to variety, purity, germination, seed health, and various important quality factors have been established by the federal government, and apply uniformly in all provinces.

Canada seed regulations have been granted equivalence to EEC (European Economic Community) rules and standards. Canada is a member of both the International Seed Testing Association (ISTA) and the Association of Official Seed Certifying Agencies (AOSCA). Member-firms of the CSTA are active in the multiplication of large quantities of seed under contract to out-of-country customers. Production of varieties in Canada is controlled under the OECD scheme for varietal certification.

In total, the Canadian seed industry offers a comprehensive range of seed services to the world. Whether the need is for varieties and germ plasm, contract seed production, or an opportunity to market a new variety in Canada, CSTA firms are ready to meet your requirements.

Forages

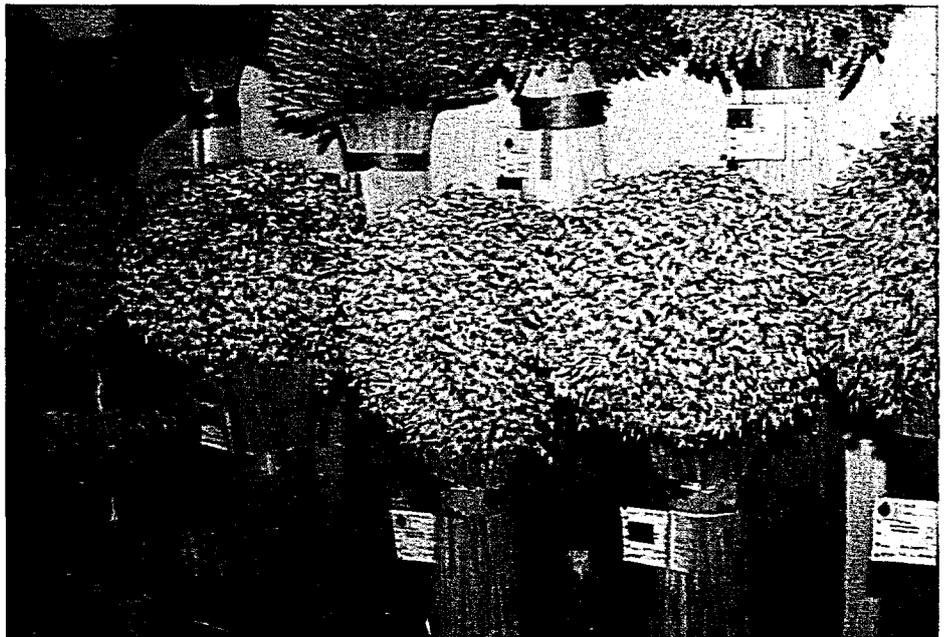
Forage seed production is a mainstay of Canada's agricultural industry. Large tracts of land - particularly in Western Canada - are ideally suited for growing forage seed crops.

Productive capacity is so great that annual output surpasses domestic forage seed requirements. Consequently, Canada is a major supplier of premier quality forage seed to world markets.

A large selection of both private and public varieties of forage species are produced in Canada. Canadians have developed a high level of expertise in the processing

and handling of these small-seeded crops. Combined with the Canadian government's very exacting standards and regulations, the industry's quality control assures customers of the best in forage seed purity and germination.

Large volumes of forage seed are also grown under contract to out-of-country clients. Federal and provincial government agricultural



Canadian breeders have developed a number of special-purpose oats varieties.

departments will evaluate adapted varieties for seed production. These programs help determine which soil types and climatic zones are best suited for seed production of particular varieties.

The trials provide data on such key factors as seed yield, maturity and winter hardiness. Once it has been determined that production of a particular variety is feasible, the best locale for growing seed is pinpointed and a production contract is negotiated.

A review of the species being produced demonstrates that Canada can provide forage seeds for most needs. Forages are meeting a diversity of requirements around the world – from pasture and stored feed through soil conserving cover crops. Additionally, Canadian-grown Creeping Red fescue is used internationally for amenity and turf purposes.

Cereals

Wheat

Bread varieties are the cornerstone of Canada's modern wheat industry. This nation's cereal researchers have also developed a host of cultivars to match specific end-uses. Today's varieties incorporate good agronomic quality. Breeders have selected for important traits such as leaf rust resistance, quality protection through sprouting resistance, and numerous other factors that benefit both grower and miller.

Barley (*Hordeum* spp.)

Barley is Canada's number one feed grain. A large selection of two- and six-row varieties have been developed for both malting and feeding purposes. The nation's plant breeders incorporate resistance to new races of important diseases. Special-purpose cultivars such as hull-less barley have also been a focus of research.



Canada's national seed regulations are recognized worldwide.

Oats (*Avena* spp.)

Interest in milling quality oats has spurred development of varieties with less hull and resistance to rust. Canadian breeders have developed a number of special-purpose varieties, including naked oats, high protein, and day-length insensitive cultivars.

Other cereals

Canadian researchers have been world leaders in the creation of improved varieties of Triticale (*Triticum* x *Secale*). Rye (*Secale cereale*) is another important cereal, and is grown for grain, forage and as a cover crop.

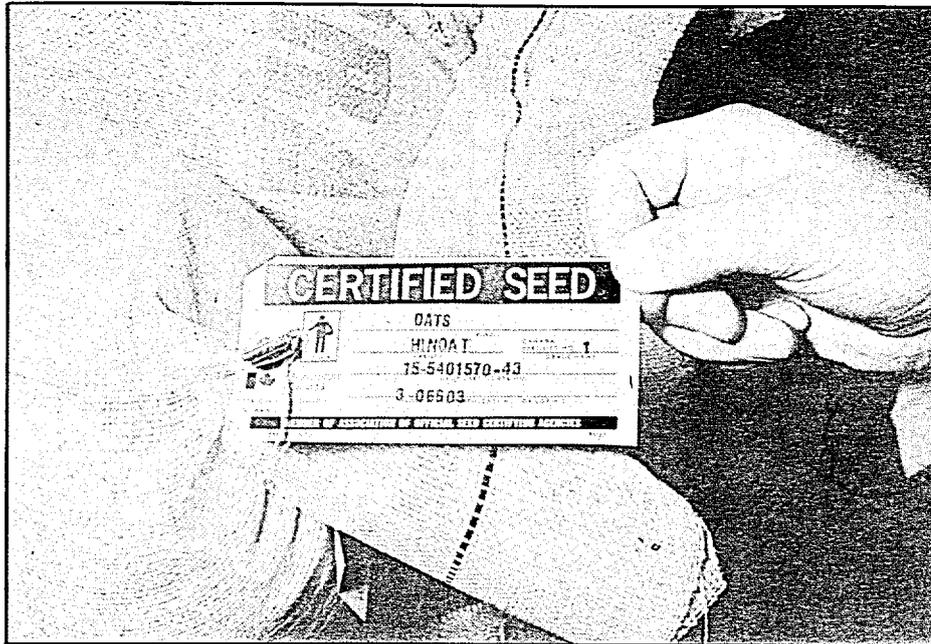
Canadian cereal researchers led the world in the adoption of haploid breeding techniques. Anther culture promises to speed the variety improvement process even further. In total, Canadian cereal research, including state-of-the-art biotechnology, is geared to providing better varieties sooner.

Hybrid corn

Geographical positioning makes Canada an ideal locale for hybrid development and seed production. The climate ranges from 'midwest cornbelt' conditions in extreme Southwestern Ontario, to the earliest limits of corn (*Zea mays*) adaptation.

Inbred lines developed at Agriculture Canada, Ottawa and Morden, Manitoba have played a key role in expanding corn production in northern Europe and short season areas of the United States. Indeed, Canada's major advantage is in early maturity material.

Southwestern Ontario offers an excellent environment for seed production of hybrids rated at FAO 500 (110 to 115 days) maturity or less. The soils and unique climate (moderated by the proximity to the Great Lakes) make the production of early hybrids particularly attractive in this region. Consequently, Canadian firms produce seed of early varieties for their customers in the United States and Europe.



Customers seeking excellent new hybrids, or firms wishing to have early hybrid seed grown under contract, are assured of varietal purity and superb quality precisely because of the exacting Canadian certification requirements, plus high grower skills and industry standards.

Canola

Less than three decades ago, a relatively small acreage of canola was grown in Canada. Today, it is one of this nation's most important crops, and certainly our number one oilseed.

Naturally, such important traits as yield, maturity, disease resistance, etc. have been emphasized in the development of improved Brassica napus and Brassica campestris canola varieties.

It was the breeding of 'double zero' varieties that made Canadian rapeseed number one worldwide for quality. The name "canola" was adapted to designate those varieties with extremely low levels of erucic acid in the oil, and glucosinolates in the meal.

Minimal erucic acid content make rapeseed acceptable for inclusion in human diets. The addition of

canola rapeseed oil to the United States' GRAS (Generally Regarded As Safe) list has reinforced the importance of low erucic acid content, and made canola rapeseed an even more prominent commodity in world markets for edible oils. Low glucosinolate content makes canola meal an excellent protein supplement for livestock rations.

In 1984, Canadian researchers achieved another important milestone in rapeseed development with the introduction of triazine-tolerant (TT) canola. Representing a completely new direction in plant breeding, TT canola permits control of mustards and many other previously uncontrollable weeds with triazine herbicides. The TT crop is unaffected by these compounds, which would completely destroy standard rapeseed varieties.

Canada is also a world leader in the development of tame mustard (*Sinapis alba*, Brassica spp.).

Soybean and Flax

Soybeans

Canadian breeders have played a key role in the development of improved soybean varieties, from

the earliest days of this crop's evolution into North America's number one oilseed. Agriculture Canada's research station at Harrow, Ontario is world-renowned for its long-term contributions to soybean breeding. More recently, breeders at Agriculture Canada, Ottawa and the University of Guelph (Ontario) have provided improved early maturing varieties that have opened up vast new areas to soybean production.

Canadian breeders have developed the very best early soybean varieties in the world. Today, the private seed trade is leading the way in introducing improved cultivars. The early and mid-season varieties give new growers an attractive, profitable crop option. Productivity of early soybean varieties approaches that of the full-season varieties.

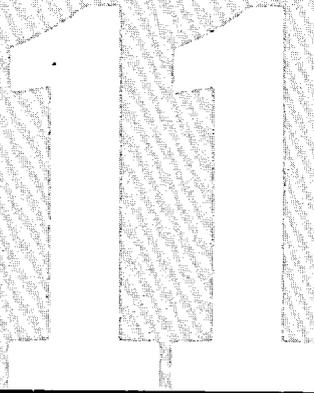
Canada's diversity of maturity zones and soil types provides an ideal environment of assessing varieties. Naturally, breeders strive to attain high yield potential, improved standability, resistance to important diseases such as white mould and phytophthora root rot, and other important agronomic traits. Rapid development of export markets for soybeans that meet human consumption standards has significantly influenced breeding efforts. The majority of new varieties feature white hila and other key quality characteristics demanded by these markets.

Flax (*Linum usitatissimum*)

Canada is a world leader in flax development with emphasis on standability, disease tolerance and provision of a range of maturities.

This specialty crop, grown primarily for its linseed oil content, also provides a high quality protein meal for livestock rations. Linseed oil is the key ingredient in high quality, oil-based paints.

CANADIAN PROFESSIONALS IN AGRICULTURE



Professionals are employed in all phases of Canadian agriculture. Some work for the federal and provincial governments in research, administration and extension. Others are on the agricultural faculties of Canada's universities and colleges. Still others work in private industry or as self-employed consultants.

Canada's consulting engineering firms also have proven expertise in the agricultural field. The Canadian consulting engineering industry is ranked among the most developed in the world and is highly competitive worldwide. With their strong and proven performance in both domestic and international markets, a great number of

Canadian consulting engineering firms are well qualified to meet the challenges presented by diverse agricultural projects and to contribute significantly to the realisation of large-scale development of agriculture in nations throughout the world.

Canadian management consulting firms provide consulting in a broad general area of management and offer expertise to agricultural industries in seven basic fields of specialization: general management and organization; computer application and management information systems; financial management; market analysis and planning; production control and operations research; human resource management; and personnel recruitment.

A strong national organization is essential in an industry as complex as agriculture in which professionals are employed by a large number of employers in both the public and private sectors, belong to a tremendous range of disciplines and are involved in all facets of agriculture, from plant breeding to primary production to processing and marketing. The Agricultural Institute of Canada (AIC), provincial institutes and scientific societies work together for the benefit of this diverse group of individuals, their employers and the agricultural industry in general.

The Provincial Institutes

Agrology is recognized in Canada through provincial legislation as a profession, similar to law, medicine and engineering.

An agrologist is a university-educated, highly trained expert who is registered with a provincial institute to practice agrology under the provisions of a provincial agrologist act.



Canada's professional agrologists provide advisory and research services using advanced technical, research and management skills.

Registration may be granted to degree graduates of a recognized faculty of agriculture, to holders of a degree in a field of study related to agriculture, or, in some provinces, to those who are able to pass rigorous, prescribed examinations if their degrees are not considered equivalent.

Provincial institutes of agronomy are now established with full legal status in all provinces except Newfoundland. All of these provincial institutes, with the exception of the Québec institute, are affiliated with the Agricultural Institute of Canada.

The Scientific Societies

Nine national scientific societies, all primarily devoted to agriculture, are affiliated with the AIC. The societies work to advance standards of research, education and practical application within their discipline. They also strive to improve the exchange of information on the national and international levels.

The Canadian Agricultural Economic Society

CAES members are concerned with solving problems relating to the economics of food production and marketing and the quality of rural life. They do this through extension, research, teaching, and policy making in government and private industry.

The Canadian Consulting Agrologists' Association

The CCAA, incorporated in 1973, is an association of professional agrologists who provide advisory and research services to clients on a fee basis. As members of CCAA,

consulting agrologists meet rigorous qualifications and adhere to a strict code of ethical professional practices. Using advanced technical, research and management skills, they provide advisory and research services to their agricultural clients including farmers, governments, farm organizations, agribusiness and international agencies.

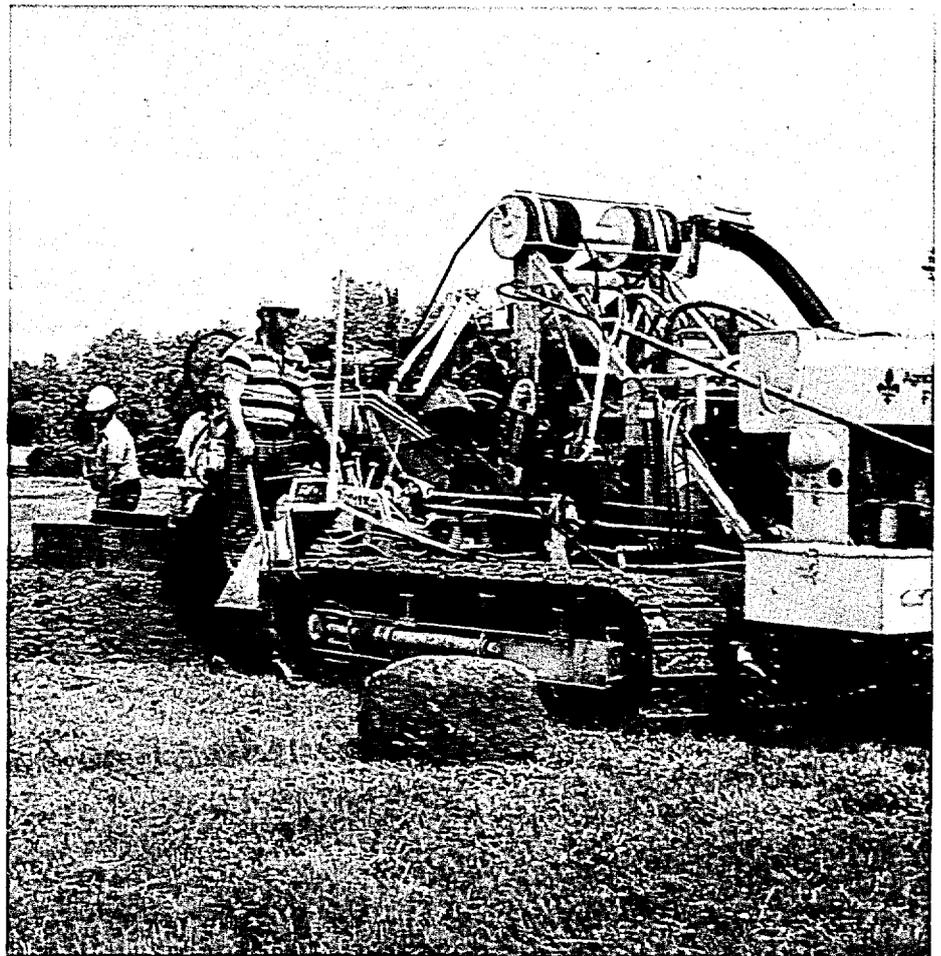
A full range of production, marketing, research and management consulting services is available from members who specialize in such areas as: animal and crop science; land use and soil science; environmental assessment; agricultural engineering; agricultural economics; farm business management; food processing; personnel recruiting; regulatory compliance; biotechnology and technology transfer.

The Canadian Pest Management Society

CPMS members are concerned with the various means of protecting crops and livestock from pests. Many are employed by government and private industry in research, development and extension.

The Canadian Society of Agricultural Engineering

Members provide expertise in the areas of farm power and machinery, structures and environment, soil and water and electrical power and processing. Many work for the private sector while others are involved in teaching and extension or in research and evaluation with government agencies.



Canadian agricultural engineers provide expertise in several areas, including farm power and machinery.

The Canadian Society of Agronomy

Society members are involved with all aspects of field crop production across Canada. Many of the country's most prominent grain and oilseed breeders are CSA members.

The Canadian Society of Animal Science

CSAS members work in such areas as research, teaching, management and production to improve the animal and poultry industries for the benefit of the producer and consumer of animal products. Many members are specialists in a particular area or type of livestock.

The Canadian Society of Extension

The majority of CSE members work with provincial agricultural ministries, university extension departments and agribusiness firms. Extension workers are active in informal education programmes in rural areas. Areas of practice include general agriculture, farm management, home economics, youth development and leadership and organization development.

The Canadian Society for Horticultural Science

Members are involved with vegetable, fruit and ornamental breeding, production and

management in Canada. Most specialize in a particular type of crop and while a large number are involved in research and teaching, many are in the field, giving practical advice to producers.

The Canadian Society of Soil Science

Members are actively engaged in land use, soils research and classification. Many members are concerned with farming practices as they affect soil quality and the development of soil-conserving cropping practices.

The International Role of the Agricultural Institute of Canada

The Agricultural Institute of Canada maintains relationships with many government, voluntary, scientific and international organizations. Sometimes the AIC acts in an advisory capacity, in other cases it provides financial assistance. The AIC works with the Canadian International Development Agency, the Commonwealth Association of Scientific Agricultural Societies and the Association for the Advancement of Agricultural Science in Africa to develop agricultural science in other parts of the world.

For additional information, contact the nearest Canadian consulate or embassy or write to:

The Agricultural Institute of Canada

Suite 907

151 Slater Street

Ottawa, Ontario

Canada K1P 5H4



Members of the Canadian Society for Horticultural Science are involved with vegetable, fruit and ornamental breeding, production and management.

BIOTECHNOLOGY AND AGRICULTURE

The biotechnology industry in Canada is relatively young but is growing rapidly. At the beginning of the 1980s, there were only a handful of Canadian firms engaged in biotechnology. Today, some one hundred specialized biotechnology firms are involved in developing and/or utilizing biotechnology. These firms carry out research and testing of biotechnological processes, and assist in integration of biotechnological innovations in a wide range of domestic and industrial operations. In addition to the specialized firms are an even greater number of industrial firms (e.g.: manufacturers, processors, etc.) which maintain their own in-house biotechnology research and development facilities for specific internal applications.

The industrial commitment to biotechnology in Canada covers the full spectrum of known applications:

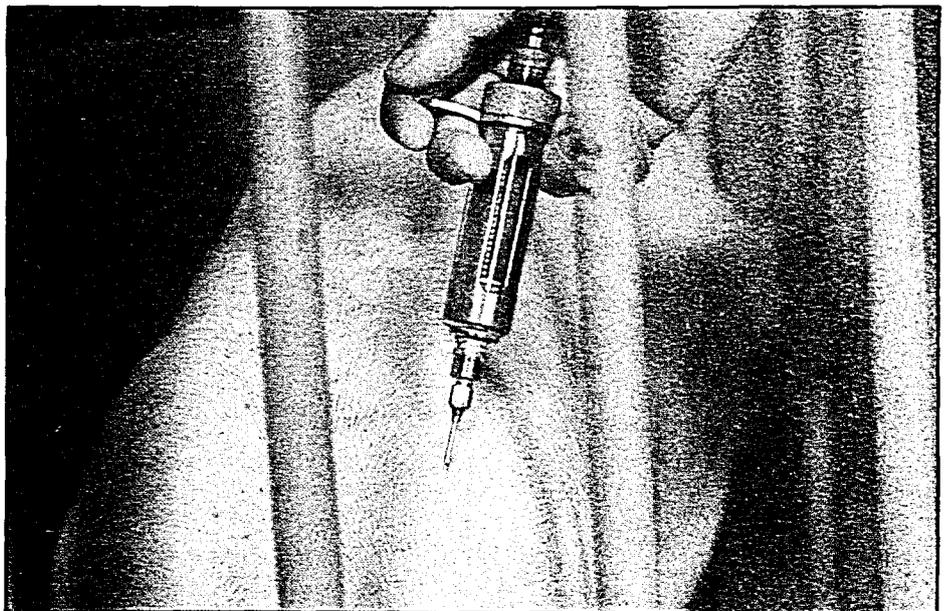
- production of drugs and vaccines;
- treatment and processing of domestic and industrial wastes (including degradation of toxic wastes);
- improvement of agricultural products;
- development of new foods and food products;
- processing of raw materials and resources including mineral extraction procedures, biomass treatment processes, manufacture or processing of chemical products.

In addition to this activity, some 25 Canadian universities have research programs in biotechnology. Approximately fifteen of these universities have international reputations in specific fields, including agriculture and animal health care. Canadian universities are increasingly turning toward the commercialization of research findings and the establishment of links with private industry.

Canada's agricultural industry constitutes a major market for biotechnological goods and services. This sector, along with the related processing, wholesale and retail sectors, accounts for more than 25 per cent of Canada's economic activity.

The magnitude of the agriculture sector market is indicated by the sizeable farm receipts in all regions of Canada (See statistical section in this issue.).

Future growth and diversification, and improvement in productivity in Canada's agriculture industry will be heavily dependent upon the realization of commercially-viable technological innovations such as embryo transplants to produce genetically-superior animals, genetic engineering to produce new types of crops and development of biological procedures to control pests.



Research and development has resulted in many new products, such as Langford Laboratories (Guelph, Ontario) porcine *E. coli* bacterin.

A number of Canadian firms have already achieved impressive results. Recent Canadian successes in biotechnology include the following examples.

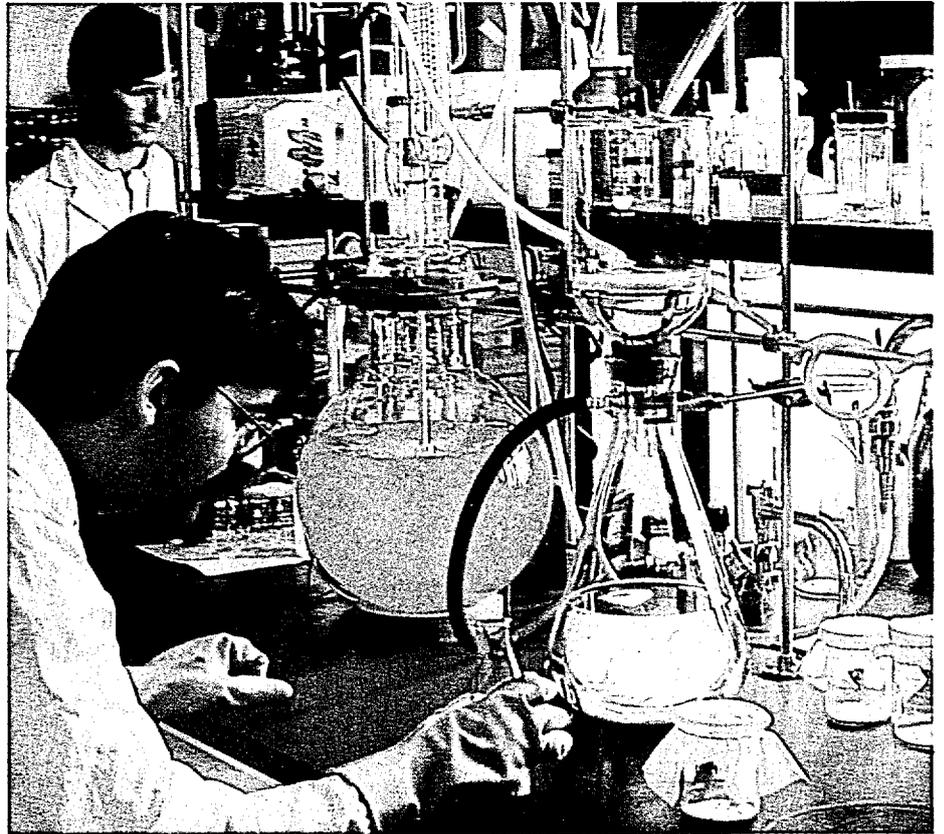
Helix Biotech Ltd., Richmond, British Columbia, in cooperation with the University of British Columbia and Jorden Diagnostics, Toronto, Ontario, has developed a simple, reliable and inexpensive cow heat test for dairy farmers. This on-farm test enables the dairy farmer to maximize milk production through identification of cows that require re-insemination. The product has been field tested and is now in production.

Safer-Agro Chemicals Ltd., Victoria, British Columbia, has developed a safe, biodegradable, fungal pest control agent based on fatty acids and elemental sulphur. The company recently received a substantial investment from Plant Resource Venture Fund of Cambridge, Massachusetts for work in natural product pesticides.

Rhizotec Inc., Québec, Québec, has successfully utilized microbial fertilizer technology developed at Laval University to produce trees which can grow rapidly in poor soils.

Major new investments by a number of Canadian and foreign-based enterprises reflect the growing interest and confidence in Canada as a place to invest in biotechnology-related agricultural projects.

Allelix Inc., a Canadian company owned through a partnership agreement by the Canadian Development Corporation, John Labatt Ltd. and the Province of Ontario, plans to invest \$100 million over the period 1983-1993 to develop and commercialize agricultural and industrial opportunities emerging from its research in biotechnology.



In the future, biotechnology will play an increasingly important role in agriculture.

Vencap Equities of Alberta, with BioTechnical International of the United States, has made an initial investment of approximately \$17 million to establish BioTechnica International of Canada Inc. for the development of herbicide-tolerant canola seed.

Ciba Geigy of Switzerland has provided a world product mandate to the **Veterinary Infectious Disease Organization of Saskatchewan (VIDO)** to test new veterinary products based on interferon for the treatment of animal diseases. In the short period from 1975 to today, VIDO has grown from a handful of people working in a cluster of make-shift laboratories, to a group of over 35

highly skilled scientists and support staff occupying one of the most advanced veterinary research facilities in North America. VIDO's staff is now pursuing the following four major research targets: neonatal diarrhea in cattle; respiratory diseases in cattle; respiratory diseases in swine; diseases in poultry caused by type 2 avian adenoviruses.

In the future, biotechnology will play an increasingly important role in agriculture. It offers the potential for new products and new production processes for established products and will ultimately give rise to a more efficient and more effective agricultural industry in Canada and worldwide.

The following firms have advertised in this Directory and their listings appear in alphabetical order, on pages 26 to 42.

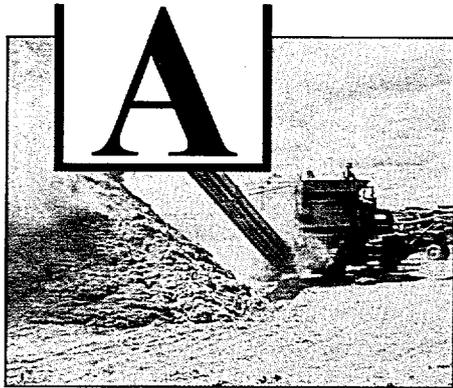
Accu Agricultural Implements Ltd.
Adams Grain Dryer Co. Ltd.
Agri-Canvas Inc.
Agricultural Development Corporation of Saskatchewan (Agdevco)
Agro Plus Inc.
Alberta Agriculture -
Market Development Division
Alberta Swine Breeders Association
Alberta Wheat Pool
Allen Potato Handling Equipment Ltd.
Arnold Farm-Vet Ltd.
Bayside Transport Ltd.
Bedirian Embryo Transfers Ltd.
Behlen Industries Ltd.
Beline Manufacturing Company Ltd.
Ber-Vac Inc.
Berglund Industrial Supply Co. Ltd.
Biostar Inc.
Brandt Industries Ltd.
British Columbia Raspberry Growers Association
The Cambrian Engineering Group Limited
Canada Packers Inc.
Canadian Aberdeen Angus Association
Canadian Brown Swiss Association
Canadian Charolais Association
Canadian Chianina Association
Canadian Hereford Association
Canadian Jersey Cattle Club -
Jersey Canada
Canadian Landrace Swine Breeders' Association
Canadian Livestock Exporters Association
Canadian Pinto Horse Association
Canadian Shorthorn Association
Canadian Swine Exporters Association
Canadian Tool & Die Works Ltd.
Cancade & Company Ltd.
C.D.M.V. Inc.
Cedar Springs Cherry Growers' Co-Operative Ltd.
Chapman's Equipment Ltd.
Chipman
B. & R. Choinière Ltée
Conag International Inc.
Degelman Industries Ltd.
Del Equipment Ltd.
Dika Construction Co. Ltd.
Donaldson International Livestock Ltd.
Edmonton Potato Growers (1971) Ltd.
Edwards Rod Weeder Ltd.
Équipements Hardy Inc.
Équipements Tardif Inc.
Erie James Limited
Fairford Industries Ltd.
Farm King Allied Inc.

Farmatic Inc.
Faromor Inc.
Flexi-Coil Ltd.
Floyde's Purebred Swine Exports Ltd.
Green Drop Equipment Ltd.
Hardi Inc.
Holland Equipment Limited
Howard Concave Corp.
Howe International Limited
Husky Farm Equipment Ltd.
Industries Desjardins Ltée
Iroquois Cranberry Growers
Jersey Cattlemen of Canada Ltd.
John Deere Limited - Welland Works
Keho Alta Products Ltd.
Kello-Bilt Industries Ltd.
Kenhar Products Inc.
KSL Industrie Ltd.
Leon's Mfg. Company
Lewis Cattle Oiler Company Limited
Linkletter Welding Ltd.
Mac Don Industries Limited
Magikist Ltd.
Maritime Farm Implements Ltd.
McCoy Bros. Group
Midland Mfg. Limited
Monarch Industries Limited
Morris Rodweeder Co. Ltd.
Okotoks Feed Service Ltd.
Olds Ag-Tech Industries Limited
Ontario Swine Breeders' Association
Oseco Inc.
Pierlot Family Farm Ltd.
Prairie Pride Enterprises Ltd.
Purebred Sheep Breeding Association of Nova Scotia
Québec International Livestock Sales Inc.
Ralph McKay (Canada) Ltd.

DIRECTORY OF CANADIAN AGRICULTURAL INDUSTRIES

13

Renn - Div. of Anthes Industries Inc.
Rite Way Mfg. Co. Ltd.
M.K. Rittenhouse and Sons Ltd.
Roche Limited, Consulting Group
Rock-O-Matic Industries
Rotheisler Equipment Limited
Roy Légumex Inc.
Sass Manufacturing Ltd.
Schouten Feeders Incorporated
Sellick Equipment Ltd.
Setl Embryo Transfers
Stirco Inc.
Stokes Seeds Limited
Sullivan Strong Scott - Division of
Strong Equipment Corp.
Superior Feed and Supply Ltd.
Swine Breeding Stock Sales
Society of Nova Scotia
Thomas Equipment Ltd.
Trail Rite Flatdecks Ltd.
Triple T Enterprises (1986) Ltd.
Ty-Crop Welding & Manufacturing Ltd.
Vary Industries
Versatile Farm Equipment Company
Versatile Noble Cultivators Company
Vicon Inc.
Weninger Industries Ltd.
Westbrooke Greenhouse Systems Ltd.
Westeel - Division of Jannock
Western Breeders Service Ltd. -
Western Breeders International
Western Industries (St. Gregor) Ltd.
Wheatheart Hydrostatic & Machine Ltd.
Wild Blueberry Association of
North America
Wilger Industries Ltd.
Will Farms
Wy-Lee Industries Ltd.



ACCU AGRICULTURAL IMPLEMENTS LTD.

P.O. Box 53
Senlac, Saskatchewan
S0L 2Y0
Tel.: (306) 228-3140
Contact:
Victor Babchuk
General Manager
Gordon Brown
Sales Manager
PRODUCTS:
Fertilizer applicators.

ADAMS GRAIN DRYER CO. LTD.

1944 St. George Avenue
Saskatoon, Saskatchewan
S7M 0K5
Tel.: (306) 652-4913
Contact:
Arnold Adams
President
PRODUCTS:
Grain dryers.

AGRI-CANVAS INC.

P.O. Box 321
Fairlane Road
Listowel, Ontario
N4W 3H4
Tel.: (519) 291-3755
Telex: 064-78585
Contact:
J.M. Verbeek
President
Christopher Elgar
Sales
PRODUCTS:
Cattle feeder belting; round baler belting;
bean windrower belts; cleated belts;
combine pick-up belts; forage wagon
belts; grain elevator belts; swather draper
belts.

Agdevco

AGRICULTURAL DEVELOPMENT CORPORATION OF SASKATCHEWAN (AGDEVCO)

Suite 1106
Chestemere Plaza
2500 Victoria Avenue
Regina, Saskatchewan
S4P 3V7
Tel.: (306) 787-5035
Telex: 071-2444
Cable: AGDEVCO
Chief Executive Officer:
Gordon A. Wells
President & C.E.O.
Foreign affiliates:
A.P.M. Ltd.
Limassol, Cyprus
Crescent/Agdevco J.V.
Lahore, Pakistan
Branch offices:
Vienna, Austria
Lusaka, Zambia
Cairo, Egypt
No. of employees: 35
Company founded: 1978
PRODUCTS AND SERVICES:
Technical and management services for
commercial and development projects;
countertrade; supply of specialty crops,
farm equipment, livestock, storage and
processing facilities.
EXPORTING TO:
The world, 34 countries served to date.

AGRO PLUS INC.

P.O. Box 23
St-Germain
Cté. Drummond, Québec
J0C 1K0
Tel.: (819) 395-4254
Contact:
Normand Julien
Export Manager
PRODUCTS:
Agricultural machinery and equipment;
ensilage and forage harvesters;
agricultural feeders, feed cookers and
tankheaters; agricultural grinder-mixers,
mixers; manure spreaders.



MARKET DEVELOPMENT DIVISION ALBERTA AGRICULTURE

Room 300
7000 - 113 Street
Edmonton, Alberta
T6H 5T6
Tel.: (403) 427-4241
Telex: 037-2029
AGINTLMKTG EDM

Chief Executive Officer:
Dennis L. Glover
Executive Director
SERVICES:

Market development assistance for
agricultural products, processed food
products, feedstuffs, and agricultural
technology.

EXPORTING TO:
All major world markets.

ALBERTA SWINE BREEDERS ASSOCIATION

General Delivery
Rosalind, Alberta
T0B 3Y0
Tel.: (403) 375-3779
Telex: 037-2966 EDM
Chief Executive Officer and
Export Manager:
Leon F. Boulter
Manager
Company founded: 1974
PRODUCTS AND SERVICES:
Swine breeding stock. Sales and shipping
arrangements.
EXPORTING TO:
Asia, Mexico, United States.

ALBERTA WHEAT POOL

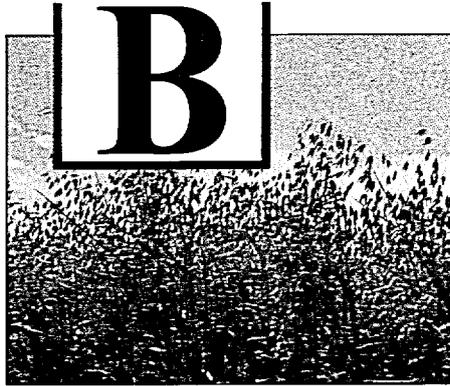
Box 2700
505 — 2nd Street S.W.
Calgary, Alberta
T2P 2P5
Tel.: (403) 290-4910
Telex: 038-21643
Chief Executive Officer:
J. Wallace Madiill
Export Manager:
N.K. Kinner
Company founded: 1923
PRODUCTS AND SERVICES:
Grain handling, farm supplies sales, seed
cleaning and sales, canola processing,
sale of export seed, fertilizer and
chemical sales.
EXPORTING TO:
Asia, Europe.

**ALLEN POTATO HANDLING
EQUIPMENT LTD.**

West Covehead
York P.O., Prince Edward Island
C0A 1P0
Tel.: (902) 672-2510
Contact:
Donald Allan
PRODUCTS:
Potato harvester and windrower; bin piler;
conveyors; graders; sizers; strippers;
pallet box bumpers; bulk boxes; buckets;
hoppers; sprouters.

ARNOLD FARM-VET LTD.

58 Dawson Road
Guelph, Ontario
N1H 6P9
Tel.: (519) 836-3330
Telex: 069-56588
Contact:
Karl Banaszek
General Manager
Jane Nemas
Sales
PRODUCTS:
Animal health care products; livestock
breeding aids; farm specialty items;
livestock identification tags.



BAYSIDE TRANSPORT LTD.

P.O. Box 66
St. Peters, Prince Edward Island
C0A 2A0
Tel.: (902) 961-2220
Contact:
Mike Burge
PRODUCTS:
Dump trailers; bulk fertilizer handling
equipment; potato handling equipment.

**BEDIRIAN EMBRYO
TRANSFERS LTD.**

R.R. No. 4
Rockwood, Ontario
N0B 2K0
Tel.: (519) 856-4960
Telex: 06-97862
GSS SVCS-HALT
attn.: Bederian
Chief Executive Officer:
Kourken (Ken) Bederian, PhD
President
Company founded: 1979
PRODUCTS AND SERVICES:
Embryo transfer service.
Embryo transfer technology training.
Embryo sales.

BEHLEN INDUSTRIES LTD.

P.O. Box 1120
Brandon, Manitoba
R7A 6A4
Tel.: (204) 728-1188
Contact:
R. Birdsell
Sales Manager
PRODUCTS:
Grain storage bins, hopper bottom bins,
grain handling equipment and aeration
equipment.

**BELINE MANUFACTURING
COMPANY LTD.**

Box 1840
1025 - 9th Avenue West
Kindersley, Saskatchewan
S0L 1S0
Tel.: (306) 463-6491
Telex: 074-2651
Contact:
W.J. Bourne
President
Don Bowman
Sales Manager
PRODUCTS:
Granular applicators (herbicides,
insecticides, nematocides, fungicides);
row crop applicator (electronic);
pneumatic applicator (granular
chemicals); ram monitor (depth); digital
computer controller (all applicators).

BER-VAC INC.

2835 chemin de l'aéroport
Thetford-Mines, Québec
G6G 5R7
Tel.: (418) 338-6153
Telex: 05-833597
Contact:
E.V. Pasklewitz
General Manager
PRODUCTS:
Cultivators and weeders.

BERGLUND INDUSTRIAL SUPPLY CO. LTD.

P.O. Box 907
Station 'F'
600 Norah Crescent
Thunder Bay, Ontario
P7C 4X7
Tel.: (807) 623-5551
Telex: 073-4532
Contact:
Norman P. Berglund
President
R. Joyce
Sales
PRODUCTS:
Grain cleaning machines.

BIOSTAR INC.

Box 1000
Sub P.O. #6
Saskatoon, Saskatchewan
S7N 0W0
Tel.: (306) 966-7473
Chief Executive Officer and
Export Manager
Stephen D. Acres
President
No. of employees: 8
Company founded: 1983
PRODUCTS:
Animal health care biologicals including
vaccines, monoclonal antibodies, and
synthetic peptides. Vaccines are developed
using conventional as well as
biotechnological techniques.
SERVICES:
A full range of services for developing,
experimentally testing, and field testing
animal health care products including
immunology, serology, pathology,
microbiology, virology. Facilities include a
gnotobiotic animal area and animal
isolation rooms.

BRANDT INDUSTRIES LTD.

705 Toronto Street
Regina, Saskatchewan
S4R 8G1
Contact:
Peter Dittman
Vice-President, Marketing
Ken Hay
Sales Manager
Tel.: (306) 525-1314
PRODUCTS:
Portable utility and swing-away grain
augers; hydraulic drill fills; field sprayers.

BRITISH COLUMBIA RASPBERRY GROWERS ASSOCIATION

204 - 2464 Clearbrook Road
Clearbrook, British Columbia
V2T 2X8
Tel.: (604) 853-1312
Chief Executive Officer:
Helmut Samotzky
President
Company founded: 1976
PRODUCTS AND SERVICES:
Raspberries. Promotion of raspberries
and products made from raspberries.



THE CAMBRIAN ENGINEERING GROUP LIMITED

2200 Argenta Road
Mississauga, Ontario
L5N 2K7
Tel.: (416) 858-8010
Telex: 06-218797
Chief Executive Officer:
Dr. S.M. Daniel
President & General Manager
Export Manager:
David F. Quan
Vice-President - Business Development

No. of employees: 105
Company founded:
Cambrian - 1966
QCKQ - 1954
SERVICES:
Feasibility studies, cost estimates, process
design and engineering, equipment
procurement, project management,
construction supervision, plant
commissioning and start-up.
EXPORTING TO:
Caribbean Islands, India, Japan, Morocco,
People's Republic of China, United
Kingdom.



CANADA PACKERS INC.

95 St. Clair Avenue West
Toronto, Ontario
M4V 1P2
Chairman & C.E.O.:
V.N. Stock
President:
J.D. Hunter
Group Vice-President International:
E.J. Roberts
INTERNATIONAL TRADE DIVISION
General Manager:
M.E. Bilyea
10th Floor
1243 Islington Avenue
Toronto, Ontario
M8X 1Y9
Tel.: (416) 766-4311
Telex: 069-84598
FAX: (416) 233-5958
No. of employees: 13,500
Company founded: 1927
Foreign subsidiaries:
Canada Packers (U.S.) Inc.; Canada
Packers (U.K.) Limited; Canada Packers
GmbH (West Germany); Fleischwarenfabrik
Waltner GmbH (West Germany); Teys Bros.
(Beenleigh).Pty. Ltd., Australia; Canafarma
S.A. de C.V. (Mexico); Canada Packers
(Japan) Inc.; Haverhill Meat Products
Limited (U.K.); Palethorpes Limited (U.K.).
AGRICULTURAL PRODUCTS:
Livestock feeds, feed supplements and
feed ingredients; turnkey projects including
building and start-up management of feed
mills; agricultural commodities including
feed grains, oilseeds and field crops.
PROCESSED FOODS:
Fresh and processed meats; vegetable
oils (crude and refined); frozen and
canned fruits and vegetables; grocery
products including peanut butter, canned
meat and dairy products; fresh fish and
seafood.
OTHER:
Chemicals; cattle hides and leathers.
EXPORTING TO:
The world; currently exporting to
55 countries.



CANADIAN ABERDEEN ANGUS ASSOCIATION

P.O. Box 663
123 Woolwich Street
Guelph, Ontario
N1H 6L3
Tel.: (519) 824-8760
Chief Executive Officer:
G. Resby Coutts
General Manager
Foreign affiliates:
All member-associations of the World
Angus Secretariat.
Regional affiliates:
Provincial associations in nine of the
ten Canadian provinces.
Association founded: 1906
PRODUCTS AND SERVICES:
Purebred Black and Red Angus cattle
available for export AND/OR Canadian
Angus genetics available through semen
and embryo export.
Over 2,000 members of the Canadian
Aberdeen Angus Association can provide
livestock adapted to a wide range of
climatic and management conditions.
The Canadian Aberdeen Angus Asso-
ciation and provincial associations in
nine Canadian provinces can help you
contact the individual breeder or group
of breeders whose genetic programs
meet your needs.
Canadian Angus offer size, growth and
maternal excellence.
EXPORTING TO:
The world.

CANADIAN BROWN SWISS ASSOCIATION

343 Waterloo Avenue
Guelph, Ontario
N1H 3K1
Tel.: (519) 824-9277
Chief Executive Officer:
Alvin Gingerich
President
Association founded:
Incorporated under Livestock
Pedigree Act in 1914.
PRODUCTS:
Purebred dairy and beef cattle.
EXPORTING TO:
Central and South America.

CANADIAN CHAROLAIS ASSOCIATION

2320 — 41 Avenue N.E.
Calgary, Alberta
T2E 6W8
Tel.: (403) 250-9242
Chief Executive Officer:
Les Ledene
SERVICES:
Beef breed association.

CANADIAN CHIANINA ASSOCIATION

R.R. No. 3
Doole Road
Ladysmith, British Columbia
V0R 2E0
Tel.: (604) 245-4973
Chief Executive Officer and
Export Manager:
Dan W. Wilson
Association founded: 1978
PRODUCTS:
Purebred cattle. Cattle semen and live
embryo.
EXPORTING TO:
The world.

CANADIAN HEREFORD ASSOCIATION

5160 Skyline Way N.E.
Calgary, Alberta
T2E 6V1
Tel.: (403) 275-2662
Chief Executive Officer and
Export Manager:
Duncan J. Porteous
General Manager
Company founded: 1902
PRODUCTS AND SERVICES:
Registration of purebred Hereford cattle in
Canada. Selling of purebred Hereford
animals, semen and embryos.

CANADIAN JERSEY CATTLE CLUB JERSEY CANADA

343 Waterloo Avenue
Guelph, Ontario
N1H 3K1
Tel.: (519) 821-1020
Russell G. Gammon
Secretary
Peter Doswell
Manager
Company founded: 1901
PRODUCTS AND SERVICES:
Canadian Jersey Breeder Magazine (11
times per year). Pedigrees of Canadian
Jersey cattle. Registration of Jersey
cattle.

CANADIAN LANDRACE SWINE BREEDERS' ASSOCIATION

118 Highgate Avenue
Pointe Claire, Quebec
H9R 2X4
Tel.: (514) 694-4650
Chief Executive Officer and
Export Manager:
A.G. Smith
Secretary-Manager
Association founded: 1952
PRODUCTS:
Association made up of purebred
Landrace swine breeders in Canada.
Formed under the Canadian Livestock
Pedigree Act.

CANADIAN LIVESTOCK EXPORTERS ASSOCIATION

P.O. Box 342
Brantford, Ontario
N3T 5N3
Tel.: (519) 756-8300
Telex: 061-81139
Chairman:
George Clemons
Export Manager:
Maria Luchtenberg
Association founded: 1972

MEMBERS

Erik Andersen Livestock Export Ltd.

R.R. No. 1
Brantford, Ontario
N3T 5L4
Tel.: (519) 753-9860

Bermaska Farms

P.O. Box 70
St. Pie de Bagot, Québec
J0H 1W0
Tel.: (514) 772-2451
Telex: 05-830559

Brubacher Sales Ltd.

R.R. No. 7
Guelph, Ontario
N1H 6J4
Tel.: (519) 822-3147

Hays Farms International Ltd.

P.O. Box 490
Oakville, Ontario
L6J 5A8
Tel.: (416) 845-5711
Telex: 06-982378

Luzza International Livestock Corporation

P.O. Box 279
Streetsville Postal Station
Mississauga, Ontario
L5M 2B8
Tel.: (416) 824-1767
Telex: 06-988508

Québec International Livestock Sales Inc.

726 Montée Ste-Julie
Ste-Julie de Verchères, Québec
J0L 2C0
Tel.: (514) 649-1122
Telex: 05-24149

Rowntree Farms Ltd./Via Pax Corporation Limited

R.R. No. 2
Brampton, Ontario
L6V 1A1
Tel.: (416) 846-3313
Telex: 06-988538

Shore Holsteins International Ltd.

Glanworth, Ontario
N0L 1L0
Tel.: (519) 633-2990
Telex: 064-73532

Valcor Export (Livestock) Ltd.

P.O. Box 210
Georgetown, Ontario
L7G 4Y5
Tel.: (416) 877-6224
Telex: 06-988550

J.M. Walker Farms International Incorporated

R.R. No. 1
Aylmer, Ontario
N5H 2R1
Tel.: (519) 773-8035
Telex: 064-73564

Western Breeders International Ltd.

c/o Douglas G. Blair
Balzac, Alberta
T0M 0E0
Tel.: (403) 226-0666
Telex: 03-821605

Western Livestock Services

8654 Prest Road
Chilliwack, British Columbia
V2P 6H3
Tel.: (604) 792-6854

ASSOCIATE MEMBERS**Agricultural Development Corporation of Saskatchewan**

c/o Dr. Milos Menhart
1106 Chestermere Plaza
2500 Victoria Avenue
Regina, Saskatchewan
S4P 3V7
Tel.: (306) 787-5038

Associated Beef Breeds of Ontario

c/o Ms. June Barnes, General Manager
R.R. No. 1
Campbellville, Ontario
L0P 1B0
Tel.: (519) 856-9827

Robert Prestage

General Delivery
Camrose, Alberta
T4V 1X1
Tel.: (403) 672-3967

PRODUCTS:

Livestock. All types of cattle; goats; swine; foxes; rabbits; sheep; horses; etc.
EXPORTING TO:
The world.

CANADIAN PINTO HORSE ASSOCIATION

Box 297
Spruce Grove, Alberta
T0E 2C0
Tel.: (403) 962-3478
Chief Executive Officer:
Dennis McCullough
President
Association founded: 1970
PRODUCTS:
Pinto horses and ponies.

CANADIAN SHORTHORN ASSOCIATION

Gummer Building
5 Douglas Street
Guelph, Ontario
N1H 2S8
Tel.: (519) 822-6841
Chief Executive Officer:
Patricia Coulson
Secretary-Treasurer
Association organized: 1886
Association incorporated: 1901
PRODUCTS:
Shorthorn cattle.
EXPORTING TO:
United States.

CANADIAN SWINE EXPORTERS ASSOCIATION

R.R. No. 2
Tavistock, Ontario
N0B 2R0
Tel.: (519) 462-2401
Telex: 06-219838
Chief Executive Officer and
Export Manager:
James S. Donaldson
Secretary-Treasurer
Association founded: 1982
PRODUCTS:
Canadian purebred breeding swine.
EXPORTING TO:
Association members export to 42
countries around the world.

CANADIAN TOOL & DIE WORKS LTD.

1331 Chevrier Boulevard
Winnipeg, Manitoba
R3T 1Y4
Tel.: (204) 453-6833
Telex: 07-587786
Contact:
J.W. Gatschuff
President
O. Kunz
Marketing Manager
PRODUCTS:
Hydraulic cylinders; hubs; spindles;
wheels; machinery; utility trailers;
agricultural accessories.

CANCADE & COMPANY LIMITED

P.O. Box 698
Brandon, Manitoba
R7A 5Z8
Tel.: (204) 728-4450
Contacts:
P. Cancade
President
C.P. Brenner
General Manager
PRODUCTS:
Agricultural truck bodies; hoists and
equipment; hydraulic cylinders and
accessories; agricultural machinery.
Truck freight bodies and equipment.

CDMV inc.

C.D.M.V. INC.

P.O. Box 608
2999 Choquette Blvd.
St-Hyacinthe, Quebec
J2S 6H5
Tel.: (514) 773-6073
Telex: 05-830515
Chief Executive Officer:
Dr. Paul Cusson, D.M.V.
Administrative Director
Export Managers:
Pierre Rivard
Marketing Director
Florent Jacques
Purchasing Director
No. of employees: 52
Company founded: 1974
PRODUCTS:
Distribution of veterinary products.

**CEDAR SPRINGS CHERRY
GROWERS' CO-OPERATIVE LTD.**

Box 223
Blenheim, Ontario
N0P 1A0
Tel.: (519) 676-8123
Chief Executive Officer:
Russell Smith
President
Export Manager:
George Thompson
Company founded: 1956
PRODUCTS:
Sour cherries. Sweet cherries.
Strawberries. Peppers.
EXPORTING TO:
United States.

**CHAPMAN'S GRAIN
EQUIPMENT LTD.**

545 Grand Avenue East
Chatham, Ontario
N7L 3Z2
Tel.: (519) 352-0100
Contact:
Don Chapman
President
PRODUCTS:
Grain storage and handling equipment.



CHIPMAN

P.O. Box 9910
Stoney Creek, Ontario
L8G 3Z1
Tel.: (416) 643-4123
Telex: 061-8631
President:
J.S. King
Business Manager:
J.S. Gilmore
No. of employees: 220
Company founded: 1928
PRODUCTS:
Chipman markets a full range of
insecticides, fungicides, herbicides,
rodenticides, miticides and seed
treatments.
EXPORTING TO:
Africa, Caribbean, United Kingdom,
United States.
Enquiries welcome from all parts of the
world.

B. & R. CHOINIÈRE LTÉE

B.P. 230
420 Côte Sud
Ste-Thérèse, Québec
J7E 4J2
Tel.: (514) 430-1022
Telex: 05-835559
Contact:
Luc Choinière
President
PRODUCTS:
Forage blowers; self-unloading farm
implement boxes; ensilage and forage
harvesters; agricultural feeders, feed
cookers and tankheaters; wagons.



**CONAG
INTERNATIONAL INC.**

39 Park Lane Court
London, Ontario
N6K 1Z6
Tel.: (519) 472-1664
Telex: 064-78585 LDN
Chief Executive Officer:
Kurt Freiter
President
Import/Export Trading House
Conag Marketing
Gordon R. Conti
Director of Marketing

Affiliates:
TanRin Food Consulting, LRG
International, Mitchell Millwrighting, plus
agents in People's Republic of China,
Taiwan, Egypt, Cuba, Honduras, Trinidad,
South Korea, Thailand, Philippines and El
Salvador.

Company founded: 1984
PRODUCTS AND SERVICES:
Design consultants, construction and
procurement managers for inland and port
grain storage facilities for all types of
cereal grains, rice drying facilities, flour
mills, feed mills, feed formulations, seed,
fertilizer, food processing, slaughtering,
dairy and bakery, facilities.

Also farm management, education
training programs, transportation and
distribution consulting. Conag Marketing
provides trading house services for trade
goods, TanRin, food consulting, LRG,
transportation and freight specialists and
Mitchell Millwrighting is a manufacturer of
facility components.

EXPORTING TO:
Africa, Caribbean, Cuba, Egypt, El
Salvador, Honduras, People's Republic of
China, South Korea, Taiwan, Thailand and
the Philippines.
Enquiries welcome from all parts of the
world.



**DEGELMAN
INDUSTRIES LTD.**

P.O. Box 830
272 Industrial Drive
Regina, Saskatchewan
S4P 3B1
Tel.: (306) 543-4447
Telex: 071-2747
Contact:
W.J. Degelman
President
G.F. Maier
Marketing Manager
PRODUCTS:
Reel and prong rock pickers; dozer
blades; rock rakes; harrows; chisel
plows; field cultivators.

DEL EQUIPMENT LTD.

139 Laird Drive
Toronto, Ontario
M4G 3V6
Tel.: (416) 421-5851

Contact:
J.C. Martin
President

PRODUCTS:

Hydraulic tailgate loaders; hydraulic hoists; bodies, fiberglass and aluminium trucks, vans, dumps, steel, wooden stake; automotive parts; automotive accessories; fabrication, fiberglass products; fiberglass truck bodies; hydraulic component parts; hydraulic cylinders; hydraulic equipment; material handling equipment; machinery; plastic products; tailgates; transportation equipment; truck bodies; truck boxes; truck equipment; truck trailer tipper; truck mounted equipment.

**DIKA
CONSTRUCTION CO. LTD.**

P.O. Box 117
Rycroft, Alberta
T0H 3A0
Tel.: (403) 765-3894

Contacts:
Mike Dika
Chief Executive Officer

Ron Campbell
Export Manager

PRODUCTS:

Harvester; tree fellers; root harrow; breaking plow; sub soiler; root rake; root windrower; grain handling system.

**DONALDSON INTERNATIONAL
LIVESTOCK LTD.**

R.R. No. 2
Tavistock, Ontario
N0B 2R0
Tel.: (519) 462-2401
Telex: 06-219838

Chief Executive Officer and
Export Manager:

James S. Donaldson
President

Company founded: 1979

PRODUCTS AND SERVICES:

Canadian purebred breeding stock. Fresh semen. Consultation. Technical assistance. Selection. Health testing. Transportation, crating and shipping. Insurance and financing.

EXPORTING TO:

42 countries around the world.



**EDMONTON POTATO GROWERS
(1971) LTD.**

P.O. Box 3847
Station D
Edmonton, Alberta
T5L 4K1
Tel.: (403) 447-1860

Chief Executive Officer and
Export Manager:

M.W. (Bill) DeVos
Company founded: 1960

PRODUCTS AND SERVICES:

Packaging and grading of potatoes. Seed potatoes.

EXPORTING TO:

United States.

**EDWARDS ROD
WEEDER LTD.**

P.O. Box 995
3102 - 5th Avenue North
Lethbridge, Alberta
T1H 0P4
Tel.: (403) 328-9201

Contacts:

N. Newton
Chief Executive Officer
Lawrence H. Edwards
Export Manager

PRODUCTS:

Hydraulic cylinders; hoe drill; cultivator sweeps, chisels; rod weeder; livestock waterers.

**ÉQUIPEMENTS
HARDY INC.**

C.P. 177
100, rue St-Arthur
Portneuf Station, Québec
G0A 2Z0

Tel.: (418) 286-3360
Telex: 051-3256

Contact:

George Lajoie
Vice-President, Marketing

PRODUCTS:

Agricultural machinery and equipment.
Grain loaders and elevators.

ÉQUIPEMENTS TARDIF INC.

55 R.R. No.1
St-Antonin
Rivière-du-Loup, Québec
G0L 2J0

Tel.: (418) 862-7574

Contact:

Léonard Tardif

President

PRODUCTS:

Conveyors. Feed cutters, grinders and crushers. Soil preparation, seeding machinery. Spring tooth harrows.

ERIE JAMES LIMITED

Box 457
102 Queens Avenue North
Leamington, Ontario
N8H 3W5
Tel.: (519) 326-4417
Telex: 064-77808

Chief Executive Officer and
Export Manager:

Donald Slater

Company founded: 1940

PRODUCTS:

Onions, carrots, apples.

EXPORTING TO:

Caribbean, United Kingdom, United States.



FAIRFORD INDUSTRIES LTD.

P.O. Box 907
 370 - 7th Avenue N.W.
 Moose Jaw, Saskatchewan
 S6H 4P6
 Tel.: (306) 693-3648
 Telex: 071-29151
 Contact:
 Earl K. Dokken
 Chief Executive Officer
 Syd Porter
 Sales Manager
PRODUCTS:
 Steel buildings; pre-engineered skin support; arch and rigid frame; rigid frame wood/steel buildings.

FARM KING ALLIED INC.

Box 1450
 301 Mountain Street
 Morden, Manitoba
 R0G 1J0
 Tel.: (204) 822-4467
 Contact:
 Larry Shroeder
 General Sales Manager
PRODUCTS:
 Agricultural machinery and equipment. Grain and seed cleaners. Grain drills. Feed cutters, grinders, crushers. Grain loaders and elevators. Mowers.

FARMATIC INC.

45 Meg Drive
 London, Ontario
 N6E 2V2
 Tel.: (519) 686-7881
 Telex: 064-7597
 Contact:
 Eric Jarman
 President
PRODUCTS:
 Grain augers; pneumatic conveyors; bucket elevators; hammer mills; grain roller mills.

FAROMOR INC.

610 Colby Drive
 Waterloo, Ontario
 N2V 1A2
 Tel.: (519) 884-3142
 Contact:
 Wayne Blenkhorn
 President
 Howard Kennedy
 Sales
PRODUCTS:
 Steel agricultural stabling; agricultural ventilation systems.

FLEXI-COIL LTD.

P.O. Box 1928
 1000 - 71st Street East
 Saskatoon, Saskatchewan
 S7K 3S5
 Tel.: (306) 934-3500
 Telex: 074-2844
 Contact:
 T. Summach
 President
 R. Shirley
 Export Manager
PRODUCTS:
 Culti-packer; land packer; harrow drawbar; spring tooth harrows; air seeder; post driver; mounted harrow.

FLOYDE'S PUREBRED SWINE EXPORTS LTD.

Box 216
 McCreary, Manitoba
 R0J 1B0
 Tel.: (204) 835-2495
 Telex: 07-587881
 Chief Executive Officers:
 Ron Floyde
 Greg Floyde
 Export Manager:
 Ron Floyde
 Company founded: 1932
PRODUCTS AND SERVICES:
 Purebred swine: Hampshire, Duroc, Yorkshire, Large English White.
 Consulting services: specific breeding programs; facility design.
EXPORTING TO:
 Southeast Asia, United States.



GREEN DROP EQUIPMENT LTD.

1230 Meridian Road N.E.
 Calgary, Alberta
 T2A 2N9
 Tel.: (403) 273-5352
 Contact:
 John Robinson
 Chief Executive Officer
 Jake Williams
 Export Manager
PRODUCTS:
 Suspension fertilizers; bandwagon fertilizer storage; flow divider kits.



HARDI INC.

477 Exeter Road
London, Ontario
N6E 2Z3
Tel.: (519) 685-6730
Telex: 064-7247

Contact:
Ian Chard
President

Sten Kjelstrup
Sales/Marketing
PRODUCTS:

Agricultural sprayer frames; agricultural
sprayers; agricultural sprayer tanks.

**HOLLAND
EQUIPMENT LIMITED**

P.O. Box 339
20 Phoebe Street
Norwich, Ontario
N0J 1P0
Tel.: (519) 863-3414

Contact:
H.R. Waiting
Vice-President

Paul C. Gillen
Marketing Manager

PRODUCTS:

Aeration agricultural equipment;
aluminium truck bodies; truck trailer
chassis; cattle head gates; truck body
tailgates.

HOWARD CONCAVE CORP.

Box 2048
Rosetown, Saskatchewan
S0L 2V0
Tel.: (306) 882-2579

Contact:
John Howard
Secretary Treasurer

PRODUCTS:

Custom combine concave trailers.



HOWE INTERNATIONAL LIMITED

Suite 310
77 Metcalfe Street
Ottawa, Ontario
K1P 5L6

Tel.: (613) 233-6264
Telex: 053-4316

Cable: HOWECONS OTT
SERVICES AND EXPERTISE:

An engineering firm whose primary
specialty is the storage, handling and
processing of grain and grain-related
products.

HOWE International offers engineering,
management and turnkey services.

ACTIVE THROUGHOUT THE WORLD:

Company founded in 1916. Subsidiary
companies in the U.K., India, Singapore
and Hong Kong.

**HUSKY FARM
EQUIPMENT LTD.**

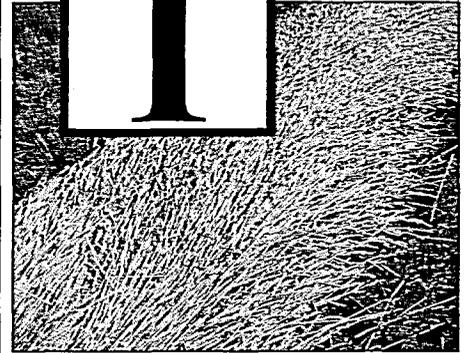
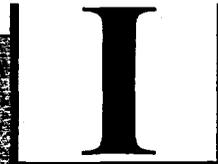
R.R. No. 2
Alma, Ontario
N0B 1A0
Tel.: (519) 846-5329

Contacts:
Raymond Grose
President

Walter Grose
Sales

PRODUCTS:

Barn cleaners; barn cleaner replacement
chains; manure spreaders; liquid manure
pumps.



**INDUSTRIES
DESJARDINS LTÉE**

P.O. Box 8
79, rue, Principale
St-André, Québec
G0L 2H0
Tel.: (418) 493-2114

Contact:
Luc Martin
General Manager

PRODUCTS:

Conveyors. Grain and seed debearding
machinery. Packing and contouring
equipment.

**IROQUOIS CRANBERRY
GROWERS**

P.O. Box 327
Bala, Ontario
P0C 1A0
Tel.: (705) 762-3343
Chief Executive Officer:
C.T. (Bud) Rennie
Export Manager:
Linda Commandant
Company founded: 1969

PRODUCTS:

Cranberries.

EXPORTING TO:

Europe.

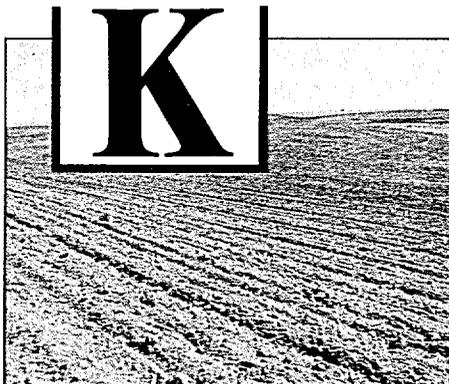


JERSEY CATTLEMEN OF CANADA LTD.

R.R. No. 1
Enniskellen, Ontario
LOB 1H0
Tel.: (416) 263-2328
Manager:
Frank Stenger
Company founded: 1970
PRODUCTS AND SERVICES:
Exporting Canadian Jerseys, young stock and milking females.
The Jersey Cattleman of Canada can coordinate or be responsible for selection and assembly for shipping. It is also involved in the domestic market and aids buying and selling of Jerseys within Canada.

JOHN DEERE LIMITED WELLAND WORKS

619 Canal Bank Street
Welland, Ontario
L3B 3N3
Tel.: (416) 734-4501
Telex: 0615156
Contact:
S.R. Hiseler
General Manager
R.B. Brennan
Marketing Manager
PRODUCTS:
Agricultural blades; rotary cutters; forage boxes; fork lifts; disc harrows; header transport; farm loaders; manure spreaders; gear wagons.



KEHO ALTA PRODUCTS LTD.

P.O. Box 70
216 Main Street
Barons, Alberta
T0L 0G0
Tel.: (403) 757-2444
Telex: 03-849396
Contact:
Roy Gullickson
President
P. Litchfield
Export Manager
PRODUCTS:
Weeder rod attachment for cultivators; aeration systems; air reels; metal bin floors.

KELLO-BILT INDUSTRIES LTD.

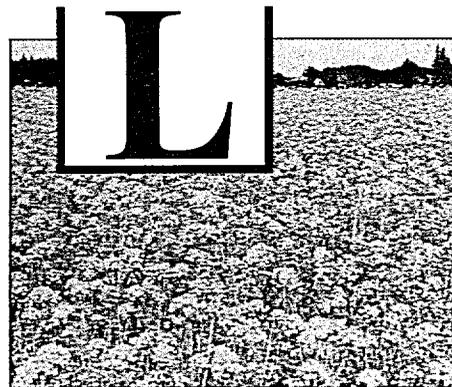
Box 119
4102 - 44 Avenue
Stettler, Alberta
T0C 2L0
Tel.: (403) 742-3363
Contact:
Hugh Kellough
President
PRODUCTS:
Various offset breaking discs; deep plow; deep tillage subsoiler.

KENHAR PRODUCTS INC.

P.O. Box 1508
Guelph, Ontario
N1H 6N9
Tel.: (519) 836-2151
Telex: 06-97530
Contact:
W.J. Harrison
President
R.D. Varilek
Marketing Manager
PRODUCTS:
Below-hook carriers; coil lifters; lift truck forks; coil handler frames.

KSL INDUSTRIES LTD. CUSTOM CONVEYING SYSTEMS

211 B - 47th Street East
Saskatoon, Saskatchewan
Contact:
Duane Leys
Director, Sales and Marketing
PRODUCTS:
Custom conveying systems.



LEON'S MFG. COMPANY

135 York Road East
Yorkton, Saskatchewan
S3N 3N6
Tel.: (306) 783-6592
Telex: 074-21544
Chief Executive Officer:
Leon Malinowski
President
Export Manager:
Ray Malinowski
Vice-President
Foreign affiliates:
Leon's Mfg. Company
200 - 36th Avenue N.E.
Airport Industrial Park
Minot, North Dakota
U.S.A.
(701) 852-2551
Leon's Mfg. Company
Box 1145
Carrington Road
Toowoomba, Queensland
Australia
(076) 30-4222
No. of employees: 90
Company founded: 1953
PRODUCTS:
Skid steer loaders; tractor-mounted loaders; tractor-mounted dozer blades; airseeding-deepbanding equipment; light, medium and heavy culti-chisels; rodweeder, culti-weeders; rock pickers; land scrapers; harrows, (mounted type); harrow drawbars (pull type).
EXPORTING TO:
The world.

**LEWIS CATTLE OILER
COMPANY LIMITED**

P.O. Box 250
Oak Lake, Manitoba
R0M 1P0
Tel.: (204) 855-2775
Contact:
Garry R. Morcombe
Manager
PRODUCTS:
Cattle oilers, hog oilers.

LINKLETTER WELDING LTD.

Central Bedeque
Summerside, R.R. No. 3
Prince Edward Island
C1N 4J9
Tel.: (902) 887-2522
Contact:
Robert Linkletter
PRODUCTS:
Farm machinery; potato boxes; buckets.



**MAC DON
INDUSTRIES LIMITED**

680 Moray Street
Winnipeg, Manitoba
R3J 3S3
Tel.: (204) 885-5590
Telex: 07-57849
Contact:
Barrie Smith
Director of Marketing
PRODUCTS:
Contract manufacturers of self-propelled
swathers (draper and auger), pull-type
swathers, pickup reels.

MAGIKIST LTD.

1488 Main Street
Winnipeg, Manitoba
R2W 3W2
Tel.: (204) 589-5468
Telex: 07-57423
Contact:
M. Cohen
President
PRODUCTS:
High-pressure washing equipment and
agricultural sprayers.

**MARITIME FARM
IMPLEMENTS LTD.**

P.O. Box 209
Middleton, Nova Scotia
B0S 1P0
Tel.: (902) 825-4040
Telex: 019-32167
Contact:
J.F. Roch
President
F.W. Roch
Director
PRODUCTS:
Land clearing machinery and equipment;
agricultural machinery and equipment.

McCOY BROS. GROUP

Box 3821
Station 'D'
1428 - 112 Avenue
Edmonton, Alberta
T5L 4J8
Tel.: (403) 454-8661
Telex: 037-2623
Contact:
T.D. Terry McCoy
Vice-President, Manufacturing
PRODUCTS:
Cultivator shanks; grain trailers; oilfield
trailers; trailer axles; leaf and coil springs.

MIDLAND MFG. LIMITED

P.O. Box 125
Rosenort, Manitoba
R0G 2W0
Tel.: (204) 746-2348
Contact:
Kim Rose
Sales
PRODUCTS:
Custom built steel truck grain boxes,
gravel boxes, pup trailers; roll-up tarps;
combine bin covers.

**MONARCH
INDUSTRIES LIMITED**

P.O. Box 429
889 Erin Street
Winnipeg, Manitoba
R3C 3E4
Tel.: (204) 786-7921
Telex: 07-57175
Contact:
Michael DeWiele
Product Manager
Pump Division
PRODUCTS:
Tie rod and welded hydraulic cylinders,
PTO and hydraulic motor driven sprayer
pumps, irrigation pumps, water systems,
liquid fertilizer pumps and mixers.

**MORRIS ROD-
WEEDER CO. LTD.**

Box 878
85 York Road
Yorkton, Saskatchewan
S3N 2X2
Tel.: (306) 783-8585
Telex: 074-21510
Contact:
Adeleine Morris
President
Grant V. Deyenberg
Director of Marketing
PRODUCTS:
Rod weeders; chisel plows; light field
cultivators; mounted and draw bar
harrows; round bale carriers; hoe and
double disc press drills; cultivator and
chisel plow air seeders.



OKOTOKS FEED SERVICE LTD.

South Railway Street
Okotoks, Alberta
T0L 1T0
Tel.: (403) 938-4094
Chief Executive Officer:
Doug Milligan
PRODUCTS:
Feed.

OLDS AG-TECH INDUSTRIES LIMITED

Olds Professional Building
P.O. Box 2445
Olds, Alberta
T0M 1P0
Tel.: (403) 556-6968
Chief Executive Officer:
Kent Ward
PRODUCTS:
Round bale handling equipment.

ONTARIO SWINE BREEDERS' ASSOCIATION

Box 550
Tavistock, Ontario
N0B 2R0
Tel.: (519) 655-2463
(519) 655-2018
Chief Executive Officer:
R.M. (Lynne) Bender
Association founded: 1916
PRODUCTS:
Purebred swine seedstock.
EXPORTING TO:
Southeast Asia, Australia, New Zealand,
South America, United States.



OSECO INC.

P.O. Box 219
Brampton, Ontario
L6V 2L2
Tel.: (416) 846-5080
Telex: 069-7535
President & General Manager:
Gabe Eros
Marketing & Production Manager:
Rod MacInnes
Trading Manager:
Helmut Koops
No. of employees: 49
Company founded: 1939
PRODUCTS:
Oseco Inc. is a manufacturer and
wholesaler of forages and turf grasses as
well as canola and corn.
EXPORTING TO:
The world.
Enquiries are welcome for either spot
trades or contract multiplication.



PIERLOT FAMILY FARM LTD.

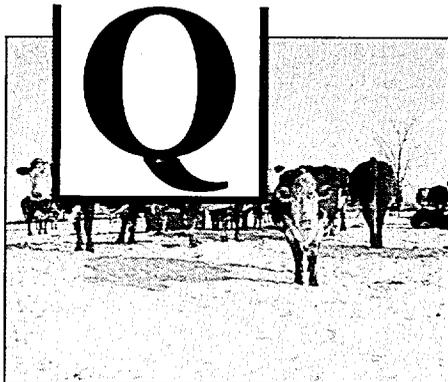
R.R. No. 2
Morell, Prince Edward Island
C0A 1S0
Tel.: (902) 961-2852
Chief Executive Officer:
H. Pierlot
Company founded: 1976
PRODUCTS:
Rutabagas, cabbage, lamb.
EXPORTING TO:
Iceland, Scandinavian countries.

PRAIRIE PRIDE ENTERPRISES LTD.

217 - 79 Eagle Drive
Winnipeg, Manitoba
R2R 1V4
Tel.: (204) 633-4996
Contact:
B. Parker
Marketing Manager
PRODUCTS:
Polyethylene hog feeders, ventilation fan
housings and hog scales, livestock
confinement equipment.

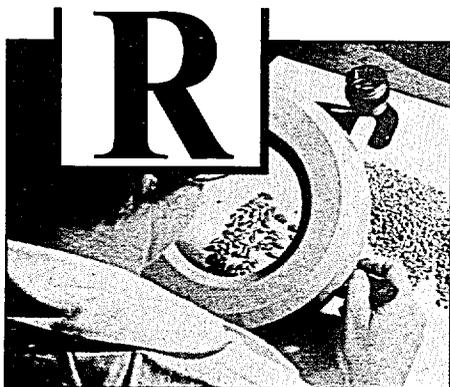
PUREBRED SHEEP BREEDING ASSOCIATION OF NOVA SCOTIA

P.O. Box 550
Truro, Nova Scotia
B2N 5E3
Tel.: (902) 895-1571
Chief Executive Officer and
Export Manager:
Angus Rouse
Secretary
Company founded: 1980
PRODUCTS:
Breeding sheep.
EXPORTING TO:
United States.



**QUÉBEC INTERNATIONAL
LIVESTOCK SALES INC.
VENTES INTERNATIONALES
D'ANIMAUX DU QUÉBEC INC.**

726 Montée Ste-Julie
Ste-Julie, Québec
J0L 2C0
Tel.: (514) 649-1122
(514) 649-1110
Telex: 05-24149
Chief Executive Officer:
Jean-Guy Trudeau
Export Manager:
Réjean Marchand
Company founded: 1965
PRODUCTS:
Dairy cattle. Embryos.
EXPORTING TO:
South Korea, Spain, Tunisia, Venezuela.



RALPH MCKAY (CANADA) LTD.

130 Hodsmen Road
Regina, Saskatchewan
S4N 5X4
Tel.: (306) 545-9292
Telex: 071-2567
Chief Executive Officer:
Hans Gaastra
President
Export Manager:
Wayne Glushka
Sales Supervisor
Foreign affiliate:
Ralph McKay Ltd.
P.O. Box 84
Footscray West
Victoria 3012
Australia
No. of employees: 60
Company founded: 1932
PRODUCTS:
Manufacturer of earth engaging tools for
agricultural implements such as sweeps,
shovels, chisels, discs.
EXPORTING TO:
France, United States.

**RENN
DIV. OF ANTHES
INDUSTRIES INC.**

12555 - 127th Avenue
Edmonton, Alberta
T5L 3E5
Contact:
Jerry Young
Divisional Marketing Manager
Tel.: (403) 452-8080
Telex: 037-2685
PRODUCTS:
Oil pumping units; mounted harrows;
chisel plow; field cultivator; combine pick-
ups; gravel and grain truck boxes; grain
rollers; hydraulic post driver; gravel pup
trailers; truck hoists; truck box
accessories.



RITE WAY MFG. CO. LTD.

P.O. Box 3344
1899 Albert Street North
Regina, Saskatchewan
S4P 3H1
Contact:
Leslie Hulicsko
President
Bob Dunkley
Sales Manager
Tel.: (306) 543-6777
Telex: 071-2633
PRODUCTS:
Harrow and harrow packer. Drawbar. Rock
pickers and windrowers. Chisel plows.

**M.K. RITTENHOUSE AND
SONS LTD.**

P.O. Box 159
Jordan Station, Ontario
L0R 1S0
Tel.: (416) 684-8122
Contact:
G.G. Rittenhouse
President
M. Rittenhouse
R. Rittenhouse
Sales
PRODUCTS:
Agricultural sprayers.



**ROCHE LIMITED,
CONSULTING GROUP
GROUPE-CONSEIL
ROCHE LIMITÉE**

2535 Laurier Boulevard
Ste-Foy, Quebec
G1V 4M3
Tel.: (418) 871-9600
Telex: 051-31593
Chief Executive Officer:
Gérard M. Gagné
President & C.E.O.
Export Manager:
Alfred Marquis
Director of International Affairs
No. of employees: 400
Company founded: 1967
SERVICES:
Consulting engineering services for the
fishing, agricultural, forestry and mining
sectors.
EXPORTING TO:
Africa, Latin America.

**ROCK-O-MATIC
INDUSTRIES**

P.O. Box 7
Vonda, Saskatchewan
S0K 4N0
Contact:
Ray Bussiere
Manager
Les Muirhead
Sales Manager
Tel.: (306) 258-2074
Telex: 074-2317
PRODUCTS:
Rock pickers; windrowers.

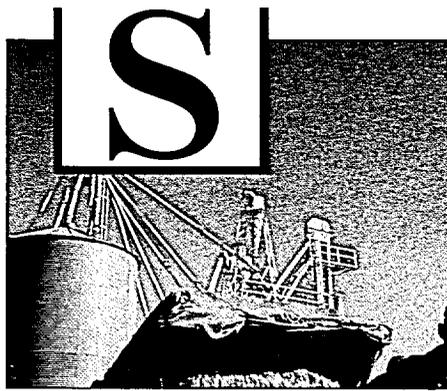
**ROTHEISLER
EQUIPMENT LIMITED**

R.R. No. 1
Oliver, British Columbia
V0H 1T0
Contact:
E. Rotheisler
President and Manager
Tel.: (604) 498-2506
PRODUCTS:
Agricultural implements and parts.
Hydraulic machinery and equipment.
Orchard equipment, machinery and parts.



ROY LÉGUMEX INC.

P.O. Box 40
243 Caron Street
St-Jean-Baptiste, Manitoba
R0G 2B0
Tel.: (204) 758-3560
(204) 758-3597
Telex: 07-57195
Chief Executive Officer and
Export Manager:
Richard Sabourin
President
No. of employees: 20
Company founded: 1977
PRODUCTS:
Dry whole and split yellow peas, dry whole
and split small fava
beans, dry green lentils, canary seed.
EXPORTING TO:
40 countries worldwide.



**SASS
MANUFACTURING LTD.**

114 Sass Road
Chatham, Ontario
N7M 5J4
Tel.: (519) 352-0600
Contact:
M.J. Sass
President
J.C. Rhodes
Sales
PRODUCTS:
Machine housing bins; material handling
conveyors; grain dryers; axial flow
pumps; plate fabrication tanks.

**SCHOUTEN FEEDERS
INCORPORATED**

R.R. No. 2
Greens Road
Caledonia, Ontario
N0A 1A0
Tel.: (416) 765-2225
Contact:
Ben H. Schouten
President
PRODUCTS:
Hog feeders.

SELICK EQUIPMENT LTD.

P.O. Box 1000
358 Erie Street North
Harrow, Ontario
N0R 1G0
Tel.: (519) 738-2255
Contact:
W.R. Sellick
President
D.M. Smith
Director of Marketing
PRODUCTS:
Fork lift bucket attachments; all types of
lift truck masts; rough terrain fork lift
trucks.

SETL EMBRYO TRANSFERS

R.R. No. 5
Saskatoon, Saskatchewan
S7K 3J8
Tel.: (306) 373-4050
Chief Executive Officer and
Export Manager:
Blaine Cnaitz
General Manager
Company founded: 1975
(North America's oldest non-surgical
embryo collector.)
SERVICES:
Setl Embryo Transfers provides commercial
bovine (beef and dairy) embryo transfers
including:
super-ovulation, non-surgical collection,
freezing, storage, splitting (micro-surgical
division of embryo producing identical
twins), preparation for export, plus
surgical and non-surgical implantations.
The firm's areas of embryo research
include sexing, different methods of
transfer and freezing, multiple micro-
surgical divisions plus work with other
species of animals.
EXPORTING TO:
Currently negotiating with the Pacific Rim,
South America and Africa.

STIRCO INC.

400 Richmond Street
Chatham, Ontario
N7M 1P9
Tel.: (519) 351-1777
Contact:
Leroy Stirling
President
PRODUCTS:
Farm implements.

STOKES SEEDS LIMITED

Box 10
St. Catharines, Ontario
L2R 6R6
Tel.: (416) 688-4300
Telex: 061-5451
Chief Executive Officer and
Export Manager:
John F. Gale
Company founded: 1934
PRODUCTS:

Flower and vegetable seed. Stokes
Seeds offers over 1,600 varieties of flower
and vegetable seeds. The firm specializes
in sweet corn, tomatoes and peppers.

EXPORTING TO:
China, Europe, Japan, United States.



**SULLIVAN STRONG SCOTT
DIVISION OF
STRONG EQUIPMENT CORP.**

74 Wildcat Road
Downsview, Ontario
M3J 2V4
Tel.: (416) 661-5880
Telex: 06-22813
Chief Executive Officer:
Jordan G. Sullivan
President

Export Manager:
Terry Evans
Project Manager
Agriculture & Food
No. of employees: 300
Company founded: 1947
PRODUCTS:

Equipment for feed mills and grain
elevators.
Belt conveyors, screw conveyors, drag
conveyors, bucket elevators.
Storage bins, and distribution systems.
Hammermills, crumblers, screeners.
Mixers, pelletizers, coolers.
Flaking mills, rolling mills.
Weigh scales, bagging equipment.

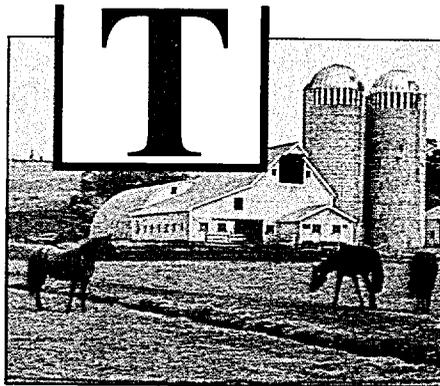
EXPORTING TO:
Africa, Asia, Caribbean, North America,
South America.

**SUPERIOR FEED AND
SUPPLY LTD.**

General Delivery
Rockyford, Alberta
T0J 2R0
Tel.: (403) 533-3811
Chief Executive Officer:
Nick Helfrich
PRODUCTS:
Livestock and poultry feeds.

**SWINE BREEDING STOCK SALES
SOCIETY OF NOVA SCOTIA**

P.O. Box 550
Truro, Nova Scotia
B2N 5E3
Tel.: (902) 895-1571
Chief Executive Officer and
Export Manager:
Angus Rouse
Secretary
Company founded: 1974
PRODUCTS:
Swine breeding stock, purebred and
crossbred.
EXPORTING TO:
United States.



THOMAS EQUIPMENT LTD.

P.O. Box 130
Centreville, New Brunswick
E0J 1H0
Contact:
H.W.B. Tiedke
President
Tel.: (506) 276-4511
PRODUCTS:
Agricultural loaders; potato harvesting
machinery.

**TRAIL RITE
FLATDECKS LTD.**

Box 1718
112th & Hwy. #35 North
Tisdale, Saskatchewan
S0E 1T0
Tel.: (306) 873-4531
Contact:
David Burton
President
PRODUCTS AND SERVICES:
Hopper bottom fertilizer bins; flat to
hopper bottom conversion; grain truck
bodies.

**TRIPLE T ENTERPRISES
(1986) LTD.**

515 McDonald Street
Regina, Saskatchewan
S4N 4X1
Tel.: (306) 924-0577
Contact:
Ken Hassman
President
PRODUCTS:
Fiberglass floor grating; catwalks, hay
pens, platforms; fiberglass flex marker
posts; roads, pipeline, survey and
miscellaneous structural components.

**TY-CROP WELDING &
MANUFACTURING LTD.**

48945 Yale Road East
Chilliwack, British Columbia
V2P 6H4
Tel.: (604) 794-7078
PRODUCTS:
Agricultural implements and parts.
Special purpose trailers. Welding and
brazing truck parts.



VARY INDUSTRIES

P.O. Box 160
Grimsby, Ontario
L3M 4G3
Tel.: (416) 945-9691
Telex: 0615436

Contact:
D.N. Fleischer
President
George Dekker
Sales Manager
PRODUCTS:

Greenhouse benching systems;
greenhouses; greenhouse heating
systems; greenhouse irrigation systems;
greenhouse ventilation systems.



VERSATILE FARM EQUIPMENT COMPANY

1260 Clarence Avenue
Winnipeg, Manitoba
R3T 1T3
Tel.: (204) 284-6100
Chief Executive Officer:

Paul Soubry
President

Export Manager:

R. Walsh

Manager, International Sales

Foreign affiliates:

Versatile Farm Equipment

5900 Deramus Avenue

Kansas City, Missouri

U.S.A. 64120

Versatile Farm Equipment Pty. Ltd.

Box 401

292 Douglas Mawson Road

East Dubbo, New South Wales

Australia 2830

No of employees: 1,000

Company founded: 1945

PRODUCTS:

Four-wheel drive tractors, combines,
swathers, sprayers, seed drills, blades.

EXPORTING TO:

Argentina, Australia, Columbia, France,
Italy, Mexico, Nigeria, Saudi Arabia,
Spain, Sudan, Tanzania, United Kingdom,
United States, Venezuela.

VERSATILE NOBLE CULTIVATORS COMPANY

P.O. Box 60

Nobleford, Alberta

TOL 1S0

Tel.: (403) 824-3711

Telex: 03849201

Contact:

W.H. Harden

Chief Executive Officer

J.P. Soler

Export Manager

PRODUCTS:

Seed drill; chisel plows; stubble treader;
components for blade cultivators; blade
cultivators; sprayers.

VICON INC.

P.O. Box 1240

1225 Franklin Boulevard

Cambridge, Ontario

N1R 6C9

Tel.: (519) 622-2800

Contact:

Frank D. Pickersgill

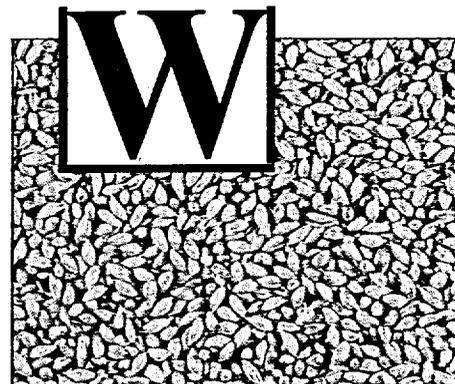
President

Clare Elston

Marketing Manager

PRODUCTS:

Round balers; field cultivators; row crop
cultivators; silage cutters; power
harrows; soil preparation
seeder/spreaders; field sprayers.



WENINGER INDUSTRIES LTD.

Box 7949

North Corman Industrial Park

Saskatoon, Saskatchewan

S7K 4R6

Tel.: (306) 931-2855

Contact:

Oswald Weninger

President

PRODUCTS:

Bale feeders and forks; bin cleaners; drill
fill augers; drill and swather transports;
hopper bottom fertilizer bins; hopper
bottoms for existing grain bins.

WESTBROOK GREENHOUSE SYSTEMS LTD.

P.O. Box 99

330 Main Street West

Grimsby, Ontario

L3M 4G1

Tel.: (416) 945-9611

Telex: 061-5291

Chief Executive Officer:

William Vermeer

President

Export Manager:

John Bergshoeff

Manager

No. of employees: 120

Company founded: 1959

PRODUCTS AND SERVICES:

Westbrook designs and manufactures a
wide range of greenhouse structures for
flowers, vegetables and hydroponic
growing.

The firm manufactures various structures
for different climates such as 18 ft. and
21 ft. span for high snow load areas, 21 ft.
and 24 ft. for high windload areas, and
36 ft. span for header houses.

The company supplies the industry with
all related systems, e.g. rolling benches,
H.I.D. lights, shading, irrigation, cooling
and exhaust systems.

EXPORTING TO:

Trinidad, United States.



**WESTEEL
DIVISION OF JANNOCK**

P.O. Box 792
450 Desautels Avenue
Winnipeg, Manitoba
R3C 2N5
Tel.: (204) 233-7133
Telex: 07-57893
Chief Executive Officer:
R.J. Atkinson
President

Export Manager:
D.W. Taylor
General Manager
No. of employees: 300
Company founded: 1852
PRODUCTS:

Grain bins (silos), hopper bins, feed bins, aeration equipment, grain bin accessories, metal roofing and siding, anhydrous ammonia fertilizer equipment, herbicide sprayers.

EXPORTING TO:
China, England, Ireland, Ivory Coast, Saudi Arabia, Trinidad, United States.

**WESTERN BREEDERS
SERVICE LTD.
WESTERN BREEDERS
INTERNATIONAL**

General Delivery
Balzac, Alberta
TOM 0E0
Tel.: (403) 226-0666
Telex: 03821605
Chief Executive Officer:
Douglas G. Blair
President
Export Manager:
Steve Harris
Company founded: 1968 (WBS)

PRODUCTS:
Frozen embryos, live cattle and embryo transfer.

EXPORTING TO:
The world.

**WESTERN INDUSTRIES
(ST. GREGOR) LTD.**

Box 104
Highway #5 West
St. Gregor, Saskatchewan
S0K 3X0
Tel.: (306) 366-2054
Contact:
Joe Menz
Manager
PRODUCTS:
Hydraulic drill fills; grain bodies; truck toppers; agra mixers; fertilizer tanks.

**WHEATHEART
HYDROSTATIC &
MACHINE LTD.**

855 - 60th Street East
Saskatoon, Saskatchewan
S7K 5Z7
Tel.: (306) 934-0611
Contact:
Al McConnell
Chief Executive Officer
David Quick
Sales Manager
PRODUCTS:
Hydrostatic binsweeps; safety augers assembly; hydrostatic augers.

**WILD BLUEBERRY ASSOCIA-
TION OF NORTH AMERICA**

18 Floral Avenue
Fredericton, New Brunswick
E3A 1K7
Tel.: (506) 472-2517
Chief Executive Officer:
G.W. Wood
Company founded: 1981
SERVICES:
Promotion of wild blueberries on domestic and overseas markets.
EXPORTING TO:
United States, Europe, Japan.

WILGER INDUSTRIES LTD.

2409 Thayer Avenue
Saskatoon, Saskatchewan
S7L 5Y1
Tel.: (306) 242-4121
Contact:
W.H. Wilger
President
PRODUCTS:
Field sprayers.

WILL FARMS

R.R. No. 1
Lynden, Ontario
L0R 1T0
Tel.: (519) 647-2648
Chief Executive Officer and
Export Manager:
Hubert Will
Company founded: 1975
PRODUCTS:
Purebred Suffolk sheep.
EXPORTING TO:
Brazil, Cuba, United States and other countries.

WY-LEE INDUSTRIES LTD.

Box 1351
West Railway Avenue
Badlands Industrial Park
North Battleford, Saskatchewan
S9A 3L8
Tel.: (306) 445-4580
Contact:
Carl L. Mino
President
PRODUCTS:
Horse, stock and rancher special trailers; flat decks; horse drawn equipment; fertilizer knives; combine header reverser.

CANADIAN FARM EQUIPMENT

In a country as large as Canada, composed of distinct geographic regions with widely divergent soils, contours and physical characteristics, it is not surprising that agricultural practice is as varied as the land itself. Each area demands special knowledge and techniques, and Canadian manufacturers have developed skills and products to meet the needs of farmers across the country.

It follows naturally that the advances in farm machinery which serve the varied farm applications in Canada are equally appropriate for similar demands and conditions in other countries. Consequently, Canadian farm equipment may be found all over the world, from the United States to Australia, the People's Republic of China, Africa and the Middle East.

The quality of Canadian farm machinery and products, their reliability and dependability, have contributed to the excellent reputation and acceptance they have earned worldwide. After-sales service, too, has helped Canadian products achieve a competitive edge. The Canadian farm equipment industry recognizes the importance of maintaining standards of performance and responds quickly to problems or difficulties. It is this commitment to excellence in both product and service which has established Canada as a world leader in the technology and supply of farm equipment.

The Evolution of Canada's Agricultural Equipment Industry

The farm equipment industry began in the 19th century and developed along with Canada. It evolved as needs and conditions dictated, perhaps the most dramatic being the dustbowl days of the Canadian prairies in the 1930s.

The Western Provinces

Special tillage, seeding and harvesting techniques emerged from the desperation experienced during the drought of the 1930s by Canada's western provinces. The soil, almost a desert, required careful rehabilitation.

Both farmers and manufacturers worked together to transform the

barren land into the agricultural heartland of today. Fully 80 per cent of Canada's farmland lies in the western dryland plains and here is the hub of grain and other field crops.

The critical reclamation of prairie lands demanded new methods, implements and machinery. Special equipment had to be produced locally and manufacturers



J I Case 400 engine horsepower four wheel drive tractor.

met the challenge. Today, western Canadian equipment for large-scale dryland farming enjoys an excellent international reputation.

The makers of these outstanding products continue their commitment to quality, research and development to meet the demands and help solve the problems of the agricultural community both at home and abroad.

There are more than 300 farm machinery and equipment manufacturers located in Canada's three prairie provinces. The largest concentration of equipment companies in the Canadian west is found in the province of Manitoba, with its capital city, Winnipeg, containing several of the largest manufacturers. Here, tractors, swathers, sprayers, grain augers, windrowers, spreaders and a wide variety of dryland farming equipment are produced.

Saskatchewan and Alberta are home to a wide range of suppliers, from tools and special blades and springs to complete storage systems, monitoring equipment and heavy machinery.

Flexi-Coil Ltd. of Saskatoon, Saskatchewan manufactures packers, harrows, air seeders and sprayers. Its products are widely used in the United States and the United Kingdom.

Currently exporting to the United States, Australia and France, **Leon's Manufacturing Company Ltd.** (Yorkton, Saskatchewan) has established a solid reputation for its high quality skid steer loaders, tractor mounted loaders, rodweeders and rock pickers.

Rock-O-Matic Industries' (Vonda, Saskatchewan) windrowers are well constructed and have been tested across Canada and the United States, Europe and South America on many different fields. This has made it possible to design a rock picker which makes an otherwise arduous chore simple. Rock-O-Matic has designed twelve different models to suit virtually every farming condition.

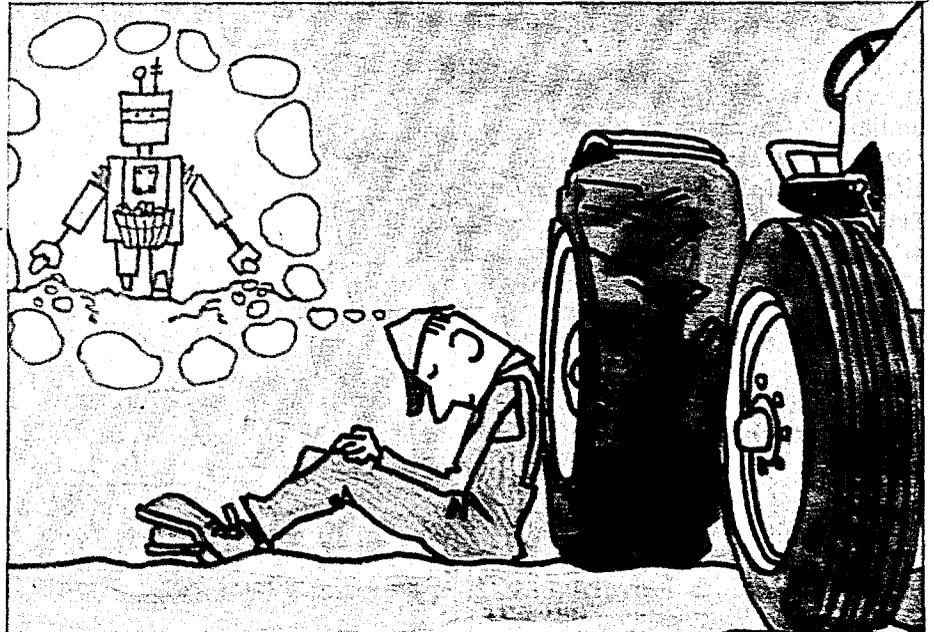
Rotoclear Mfg. Ltd., of Calgary Alberta, markets land clearing equipment that can mulch a stump of up to two metres across. The firm's equipment is currently in use in the United States, Argentina, West Germany and Mexico.

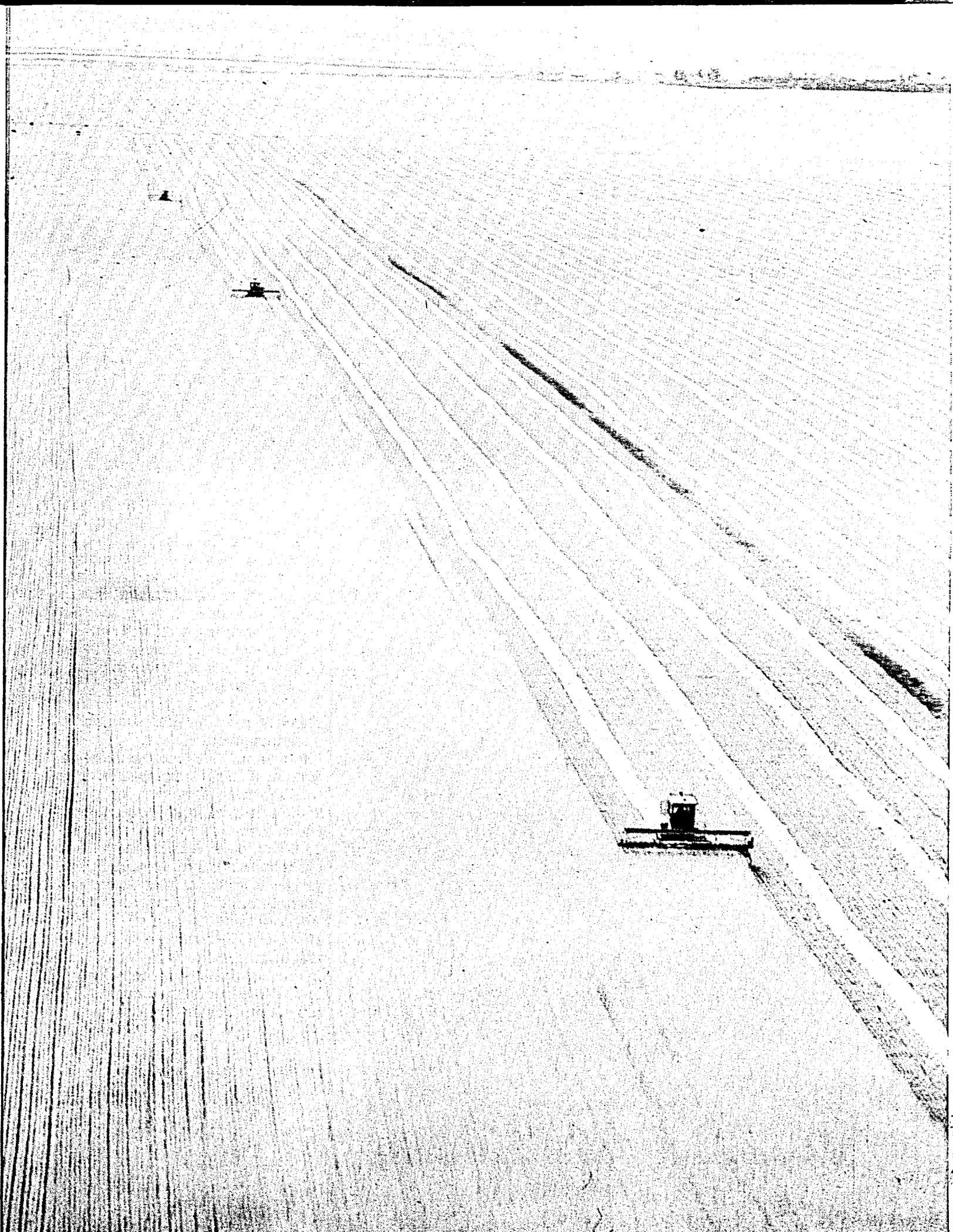
Versatile Farm Equipment Company of Winnipeg, Manitoba has long been known for dependable, innovative and reliable farm equipment. Versatile was among the first companies to mass produce high horsepower four wheel drive tractors. The firm also

introduced one of the biggest pull type combines currently on the market. Other products in the Versatile line-up are field cultivators and weeders, sprayers, swathers and windrowers.

Ralph McKay, with head offices in Regina Saskatchewan, is looked upon as an industry leader. Its agricultural tillage tools, in particular, have long been established as among those that wear the longest. Ralph McKay has an impressive record in engineering and production innovation. The firm's sweeps, formed from high grade, heat-treated Canadian steel, incorporate unique features which combine durability and efficiency.

Beline Manufacturing Co. Ltd. (Kindersley, Saskatchewan) brings state-of-the-art electronics to the application of insecticides and herbicides. The tractor-mounted control gives finger tip rate adjustment and setting, rate change on the move, immediate off-and-on





at row ends, headlands and corners. Compact design and low weight make these units ideal for the export market; they are widely used in Western Europe, the United States and Australia.

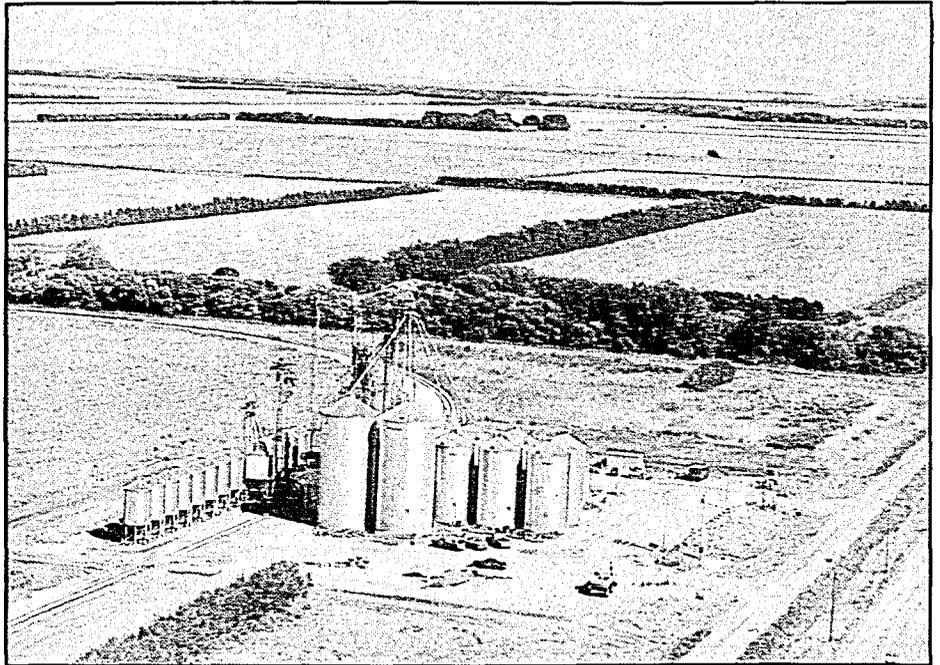
Winnipeg, Manitoba's **Uniflyte Co. Ltd.** specializing in grain handling equipment, manufactures precision roll formed helicoid flighting. Products are made using only the finest quality steel and are available in right- or left-hand spirals.

The **Keho Alta Products Ltd.** (Barons, Alberta) product line includes natural air drying and aeration systems with backward curve centrifugal blowers and airway pneumatic header attachments for combines. Keho is particularly active in the U.S. market and is currently seeking to expand into Mexico and Egypt.

Winnipeg, Manitoba-based **Westeel** markets grain bins, hopper bins, feed bins and aeration equipment. Also offered are grain bin accessories, metal roofing and siding, anhydrous ammonia fertilizer equipment and herbicide sprayers. Westeel serves markets located throughout the world: People's Republic of China, Ivory Coast, Saudi Arabia, Trinidad, the United Kingdom and the United States.

The Eastern Provinces

Agriculture has many dimensions in the east, with mixed, dairy and livestock, fruit and vegetable, grain and cereal crop farming all very much in evidence.



Westeel grain storage bins.

Machinery and tools to service these many farming endeavours are produced. Today's implements have been specially designed and include sophisticated poultry incubation equipment, special tobacco processing equipment, cultivators, rotary snowplows, round balers and hay stacking systems, among others.

Animal husbandry has created its own demands, and producers of top quality forage boxes, feed carts, bedding choppers, storage bins and farm wagons have provided equipment to cope with special livestock requirements, in addition to manufacturing harvesting equipment.

Land clearing and improvement equipment is manufactured in the maritime provinces, as well as high capacity potato handling and harvesting equipment and skid steer loaders.

W.R. Smale Co. Ltd. (Mossley, Ontario) has developed a line of efficient livestock handling equipment for cattle and swine. Smale products include cattle penning sections, sectional cattle feeders, electronic scales, farrowing stalls and cattle shutes and head gates.

The **J I Case** Hamilton, Ontario plant manufactures Case International tillage and planting equipment for North American and world markets as well as forage and material handling equipment and windrowers. Approximately 2,400 outlets in North America and extensive sales and service outlets serve the firm's international clients.

DeCloet (Tillsonburg, Ontario) manufactures diesel-powered, hydrostatic drive sprayers which have earned an international reputation. Designed specifically

for large scale applications, they are equally at home ground spraying crops such as soybeans and peanuts or using their high clearance ability for crops such as sugar cane or tobacco.

Sullivan Strong Scott
(Downsview, Ontario) specializes in equipment for feedmills and grain elevators.

Westbrook Greenhouse Systems Ltd. of Grimsby, Ontario exports a wide range of greenhouse structures for flowers, vegetables and hydroponic growing to all parts of the United States. The company designs its structures for use in variable climates and also supplies a complete line of related systems such as rolling benches, and irrigation, cooling and handling equipment.

Agro Plus Ltd. (St-Germain, Québec) markets feed carts, hay dryers, ensilage and forage harvesters, grinder-mixers and manure spreaders. Now negotiating with potential clients in Africa, Saudi Arabia and the Netherlands, Agro Plus is already active in England, the United States and Mexico.

Farm Equipment Manufacturing in the Canadian Economy

Farm machinery companies contribute significantly to the Canadian economy. Not only do three multinational companies produce in Canada, but also more than 400 companies serve local, national and international markets.

The "shortliners," the large number of domestic companies which produce limited lines of equipment, make a substantial, valuable and increasing contribution to the economy. Ranging in size from small local shops to national corporations, the innovative shortliners are found across the country, wherever farming is an important economic activity.

A Promising Future

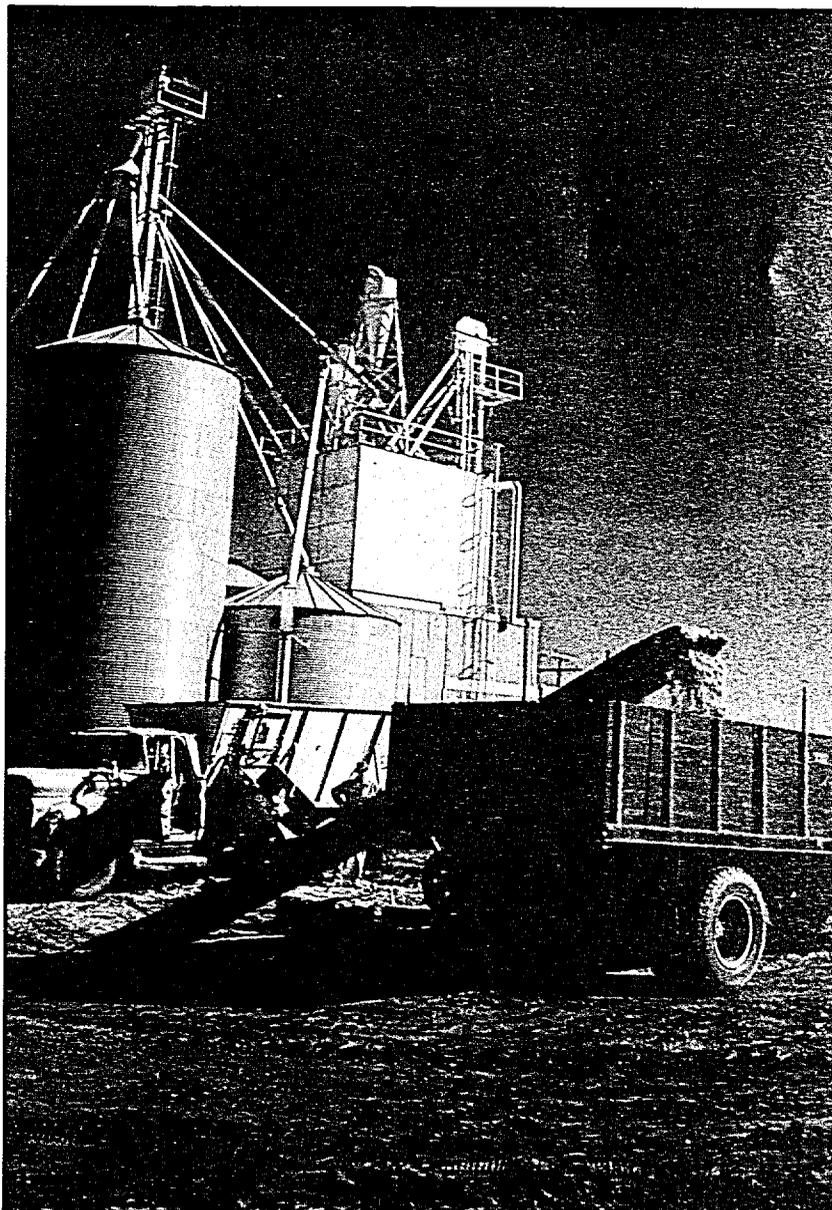
The need for greater efficiency and increased productivity has never been more obvious; an overgrowing world population and

shrinking resources to feed that multitude issue a special challenge to agricultural producers.

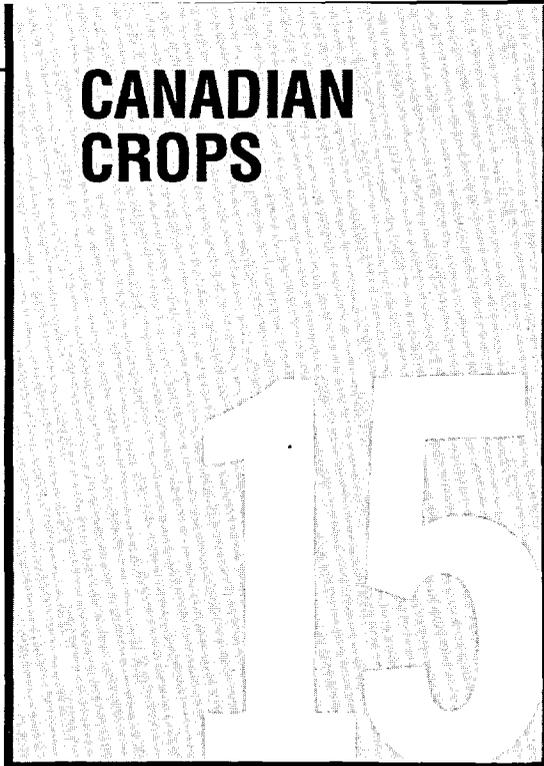
Canadian equipment manufacturers continue to study and develop new machinery and technology to meet the challenge. The latest equipment and applications tested and proven in Canada are relevant throughout the world. Canadian industry professionals are eager to share their results internationally.

For more information on this sector of Canadian agriculture, please contact your nearest Canadian consulate or embassy. ■

The latest farm equipment and applications tested and proven in Canada are relevant throughout the world.



CANADIAN CROPS



Historically, wheat has always contributed significantly to the Canadian economy. In 1986, cash receipts from the sale of wheat exceeded \$2,800 billion. However, wheat is not the only grain grown in Canada; oats and barley (especially in the Western provinces) and corn (in Ontario) are essential to the Canadian livestock industry. Preliminary

statistics indicate that in 1986, cash receipts from the sale of oats reached \$48 million, those from barley, \$775 million, and those from corn, \$414 million.

The oilseeds -- rapeseed, flaxseed, soybeans and sunflower seeds - make up the third major type of field crop. These crops are processed to produce vegetable oils

for human consumption or industrial use and high-protein meal for livestock feed. Production of rapeseed, flaxseed and sunflower seed is centred in the Prairie provinces, that of soybeans in Ontario. In 1985, exports of oilseeds accounted for \$843 million with rapeseed accounting for \$544, flaxseed for \$219, mustard for \$41 and soybeans and sunflower seed for \$40 and \$9 respectively.

Outside the Prairies, field crop production is more diversified. The degree of emphasis placed on livestock production influences the kinds of field crops grown and the proportion of land devoted to forage crops, pasture and feed grains. In Ontario, grain corn is an important crop for livestock feed as well as for industrial uses.

The fruit and vegetable industry is also an important part of the agricultural and food distribution sectors of the Canadian economy. Fresh and processed fruits and vegetables account for more than one-third of the quantity of all food consumed by Canadians and there are over 30 fruit and vegetable crops grown commercially in Canada.

By far the most important fruit crop grown in Canada is the apple, which accounts for almost fifty per cent of the value of commercial Canadian fruits. Commercial apple orchards are found in Nova Scotia, New Brunswick, southern Québec, Ontario and the interior of British Columbia, particularly in the Okanagan Valley. Tender tree fruits - pears, peaches, cherries and plums -- are also grown in Ontario, with the most important concentration in the Niagara region. These fruits, as well as apricots, are also grown on a large scale in the southern part of the Okanagan Valley in British Columbia.



Wheat, oats, barley and corn are important grain crops in Canada.

In addition to tree fruits, strawberries and raspberries are cultivated commercially in the Maritime provinces, Québec, Ontario and British Columbia. British Columbia fruit growers also produce loganberries commercially in the lower mainland and on Vancouver Island. Grapes are grown in the Niagara District of Ontario and in the Okanagan Valley; grape production has increased considerably in recent years, reflecting the increasing popularity of Canadian wines. The native blueberry is found wild over large areas in Canada and is harvested in commercial quantities in the Atlantic provinces, particularly New Brunswick, and Québec; a cultivated crop is grown in British Columbia.

The production of field-grown vegetables in Canada is seasonal. During the growing season varying percentages of domestic requirements are met by Canadian crops. Some vegetables are exported from Canada, particularly to metropolitan areas in the United States.

Potatoes are the most important of the vegetables produced in Canada. All the provinces except Newfoundland produce potatoes commercially, with the Maritimes accounting for nearly 43% of Canadian potatoes. Soil and weather conditions combine to make regions within the Maritime provinces ideal potato-growing areas. Indeed, Prince Edward Island and New Brunswick potatoes are generally regarded as among the finest available on any world market.

P.E.I. produces the largest number of seed acres of any province in Canada and, at the same time, also has the lowest level of disease of any potato growing area in the world. The Russett Burbank strain is the most common variety of potato grown here.

New Brunswick potato producers plant an average of 53,000 acres annually and in 1984 total production reached the 522,221 tonne level.

An increasing demand for floral crops on world markets has created excellent export opportunities for Canadian producers. In the 1984-85 season, Canada exported to 55 different countries around the world, with the two major markets being the United States and West Germany.

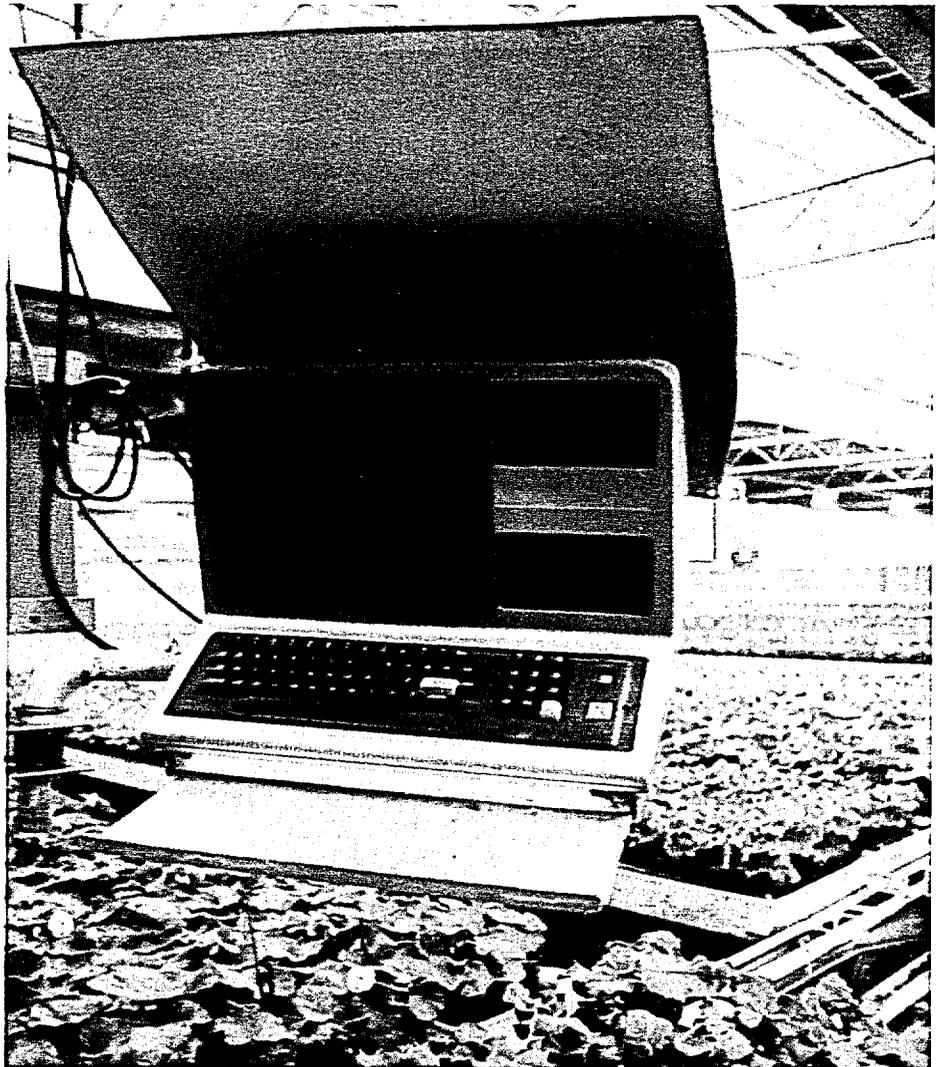
Greenhouse growers located in Ontario and British Columbia have developed a strong market demand for Canadian-grown, high quality, flowering potted plants and, to a lesser degree, cut flowers.

The combined exports of ornamentals, which includes floral and nursery crops, reached the 40,000,000 unit mark, including 17,226 phytosanitary certificated to the United States alone.

Canadian greenhouses are highly specialized and use many state-of-the-art techniques which, while they reduce labour costs and increase productivity, ensure top quality products suited to the exacting standards of international customers.

Canada's primary agricultural crops enjoy an excellent reputation around the world and Canadian producers will no doubt continue to attract significant international markets. ■

Canadian greenhouses are highly specialized and use many state-of-the-art techniques.



THE CANADIAN FERTILIZER INDUSTRY

The Canadian fertilizer industry produces three nutrients, nitrogen, phosphorus and potassium, that are vital to plant growth and production. These nutrients are made available for plant utilization in the form of basic fertilizer materials which include ammonia, ammonium nitrate, ammonium sulphate, ammonium phosphate, urea and potash.

Canada's chemical fertilizer industry began in 1869 at

Brockville, Ontario. In that year, Brockville Chemical and Superphosphate Company began treating phosphate rock obtained from nearby Lanark County with sulphuric acid manufactured from iron sulphides.

Ammonium sulphate as a by-product of coking ovens was first produced in Canada in 1901 in Sydney, Nova Scotia. The first nitrogen producing plant in Canada began operations in 1909 in Niagara Falls, Ontario.

In 1940, Canada began strategic production of ammonia and nitrogen-based explosives for the Allied forces. Four ammonia producing plants, two in British Columbia, one in Alberta and one in Ontario all came into production within a year of commencement of construction. Canada's annual nitrogen production capacity doubled to approximately 220,000 tons within that same year. In the immediate post-war years, this capacity was successfully converted to fertilizer production to meet the increase in demand for food and the growing awareness of the benefits of using fertilizers to increase food production capacity.

The 1950s was a period of steady growth in Canada's fertilizer production and consumption and important progress in laying the groundwork of today's modern fertilizer industry was made at that time. The size and scope of Canada's vast resources of natural gas, potash and sulphur and how they could be used in fertilizer production were explored and capitalized upon. Use of natural gas as a highly economic and efficient feedstock and energy source for the production of ammonia was demonstrated in production plants coming on stream in western Canada. Meanwhile, construction of a pipeline was undertaken to make Alberta natural gas available for use in ammonia production in eastern Canada.

Finally, the introduction of innovative refrigeration and ventilation techniques and the later development of solution mining made Canadian potash production commercially viable.

It was during the 1960s that the rapid growth of the Canadian fertilizer industry began. The expanding world population and changing consumption patterns enormously increased demand for food. Food production rose, planting acreages were increased, more intensive cropping began and



Canada supplies 25% of the world demand for potash fertilizers.

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

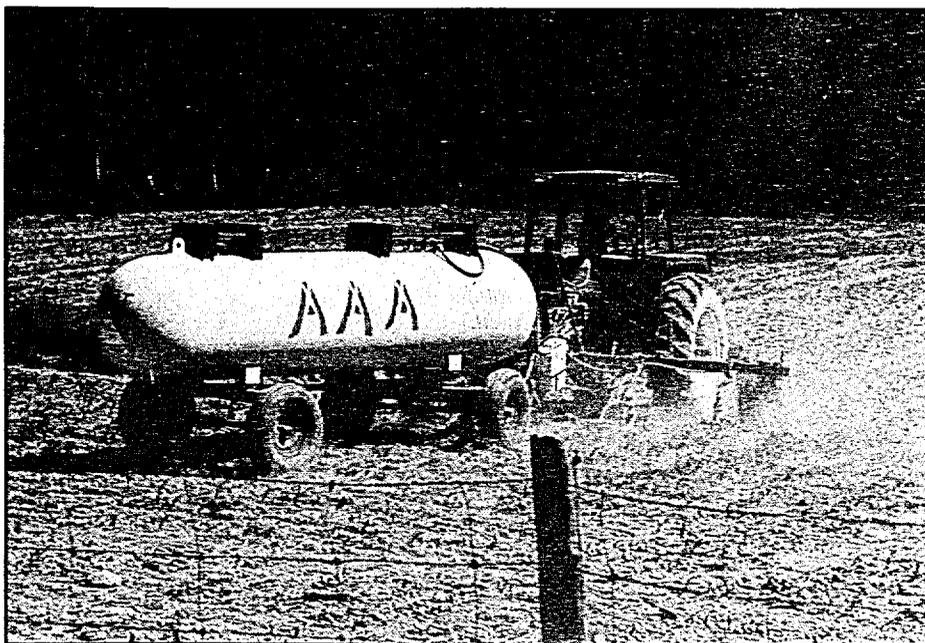
Canadian fertilizer production grew remarkably over the 1954 to 1984 period. This extraordinary growth is evident considering the fact that Canada, which produced no potash before 1962, now supplies 25% of the world demand for potash fertilizers. Nitrogen production increased by ten times over the course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

The Three Nutrients

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

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

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



In 1984, fertilizer exports from Canada had a value of \$1.67 billion.

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

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

An efficient and innovative industry

Canada's fertilizer industry represents a capital investment of

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

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

Dextran Products Limited (A Division of Polydex Chemicals Limited)

421 Comstock Road, Scarborough, Ontario M1L 2H5 Tel.: (416) 755-2231 Telex: 06-963599 USHERDEX

THE COMPANY

Dextran Products Limited was founded in 1936 in England by Thomas C. Usher who was one of the first to discover Dextran and, along with Sir Norman Haworth, helped pioneer its use as a blood plasma expander. The company moved to Toronto in 1966 and became a public corporation under a holding company, Polydex Chemicals Canada Ltd.

ACTIVITIES AND PRODUCTS

Veterinary pharmaceuticals and specialty research chemicals have been the backbone of the company with recent diversifications into high pressure liquid chromatography and tissue culture sera.

At the present time, Dextran Products is the only manufacturer in Canada of injectable iron dextran veterinary grade which is available in ten or twenty percent concentrations.

In the agriculture field, animal feed additives have been recently added to the company's activities by the acquisition of Western Magnesia Corporation which operates out of our facilities in Toronto. This company is presently manufacturing magnesium sulphate and plans for expansion into other magnesium, aluminum and iron salts are already underway.

INTERNATIONAL EXPERIENCE

Dextran Products has exported its products throughout the world for over 20 years. Markets in North and South America are also covered by a subsidiary of Polydex, Veterinary Laboratories of Lenexa, Kansas. This company, recently acquired,

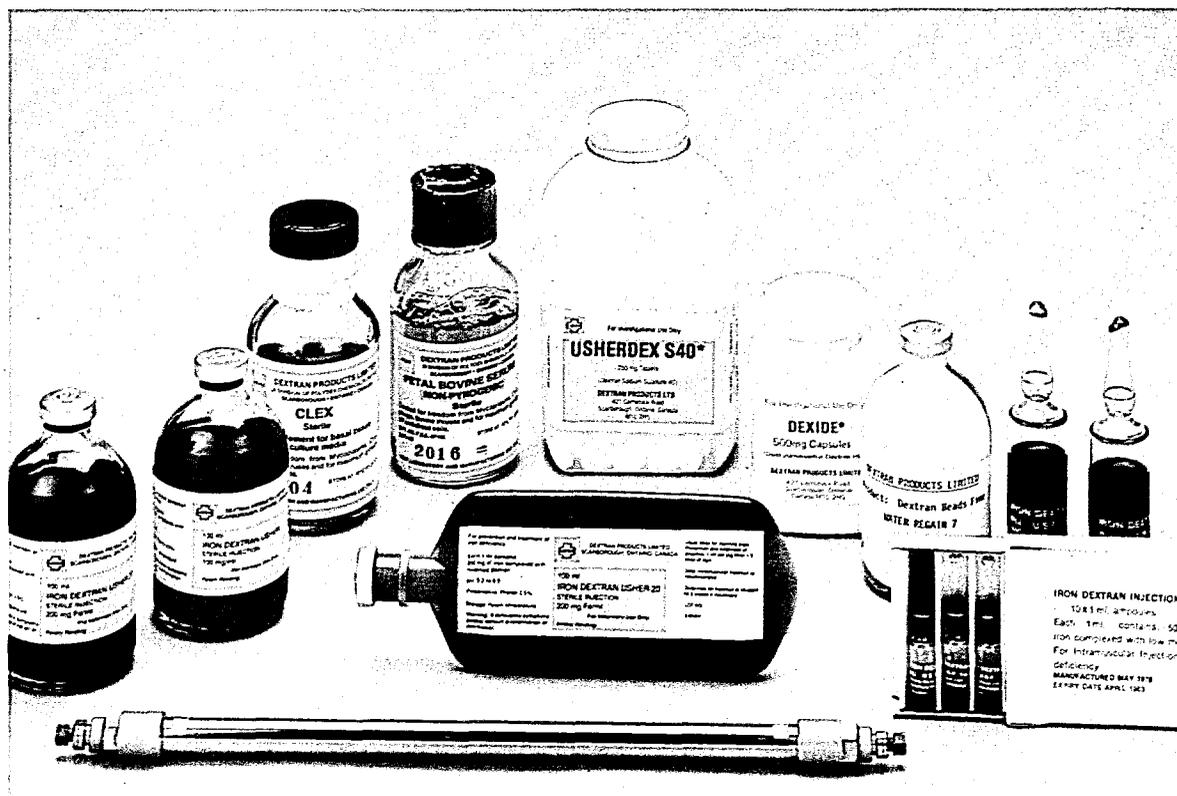
occupies 75,000 square feet and produces over 100 different agricultural and veterinary products. Renowned for the quality of its products and its ability to respond to individual customer requirements, Dextran is constantly seeking new markets for its array of increasingly varied products.

PRODUCTS

Iron Dextran veterinary grades
Veterinary parenterals and external liquids
Agricultural tablets and boluses
Aluminum salts
Magnesium salts
Iron salts
Cross-linked Dextran beads
Micro-carrier beads
HPLC columns
Iron Dextran human grade
Dextran powder technical grades
Various molecular weights
Dextran sodium sulphate
Various molecular weights
Diethylaminoethyl-dextran
Sodium cellulose sulphate
Various viscosities
Fetal bovine serum
Clex

INFORMATION

For further information, contact:
Sharyn St. Louis
Administrative & Sales Executive
Dextran Products Limited



THE COMPANY

Luzza International Livestock Corp. is one of the largest exporters of livestock, not only in Canada, but also in North America. In 1985 alone, Luzza accounted for approximately two-thirds of Canada's total overseas exports of registered purebred stock.

SPECIALIZATION

Luzza International is a company established for the purpose of marketing Canadian livestock worldwide. Although Holstein cattle are our prime export, orders for other dairy breeds, beef cattle, swine, sheep, goats and horses, have also been filled. Our modern export facility is government-approved and can accommodate shipments of any size.

INTERNATIONAL EXPERIENCE

Our staff is fluent in four languages and has been involved in successful shipments to countries in every corner of the world. This enables us to provide our customers with the utmost selection, preparation, and shipping service for just one special animal or for a boat load!

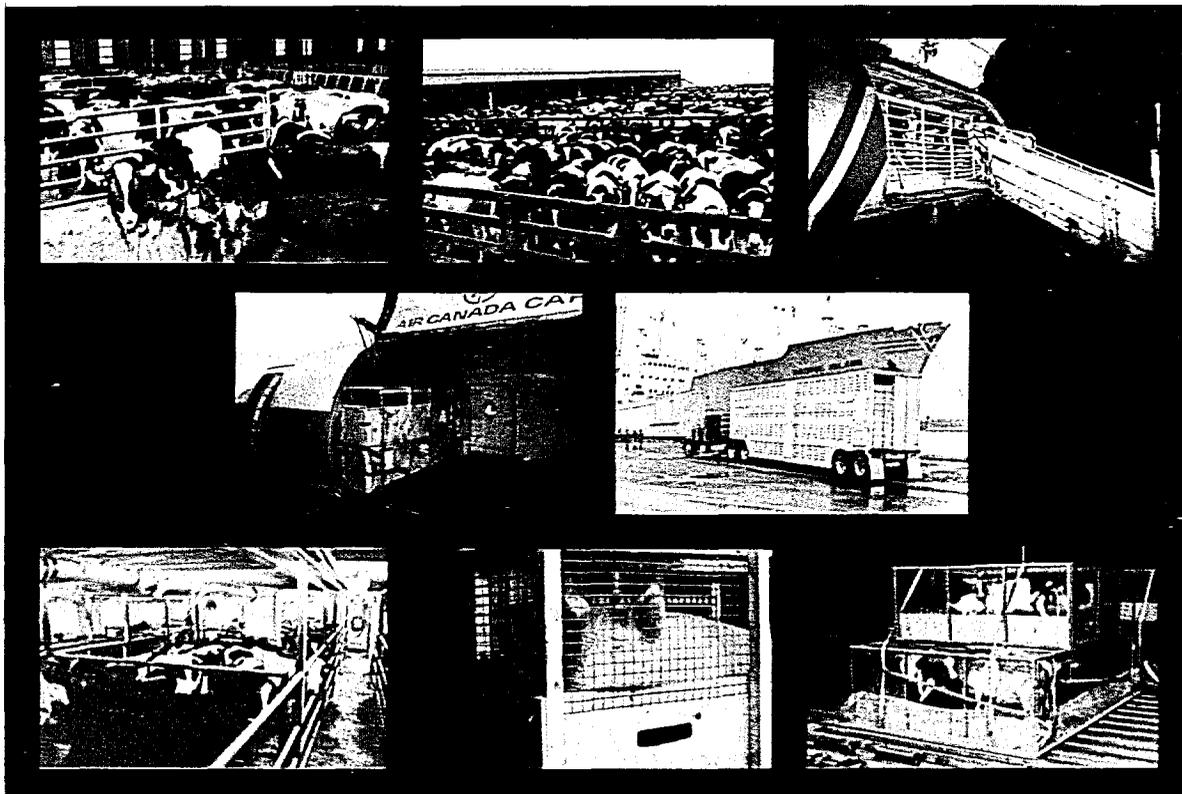
INFORMATION

Farm location:
7471 Trafalgar Road at Highway 401, Milton, Ontario;
just 15 minutes west of the Toronto International Airport.

All enquiries are welcome and may be directed to:
Jorge A. Luzza
or Julio Durdos
P.O. Box 279
Streetsville, Ontario
L5M 2B8
Tel.: (416) 824-1767
Telex: 06-988508

P.O. Box 279, Streetsville Postal Station, Mississauga, Ontario L5M 2B8 Tel.: (416) 824-1767 Telex: 06-988508

Luzza International Livestock Corporation



TCI-Superior, Division Mueller Canada Inc.



6500 Northwest Drive, Mississauga, Ontario L4V 1K4 Tel.: (416) 677-9000 Telex: 06-968814

SPECIALIZATION

TCI-Superior designs, manufactures and sells stainless steel liquid processing systems for the dairy, food and beverage industries; and paint handling systems for the automotive industry.

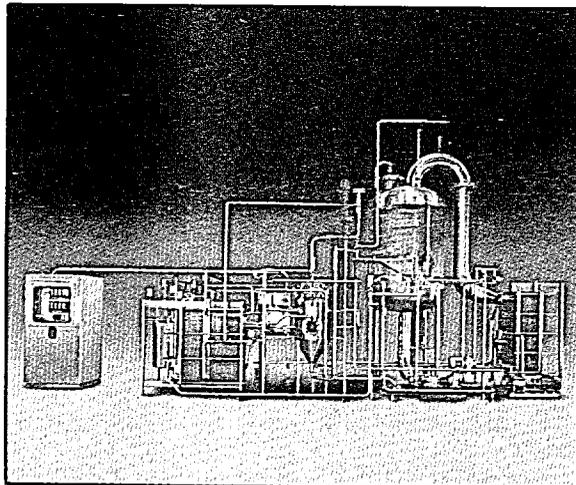
THE COMPANY

Virtually every part of a TCI-Superior system is manufactured by TCI-Superior at its plant west of Toronto, Ontario, or at the company's Standard Products Division in Delavan, Wisconsin. The company is proud of its ability to give complete single-source service on even the largest projects. From initial consultation through preparation of drawings, manufacture of prefabricated piping systems, tanks, vessels, heat exchangers, valves, fittings, pumps; through design and development of control systems, including complete software packages; through to installation, start-up and on-site support, a customer need deal only with one company.

ACTIVITIES AND PRODUCTS

TCI-Superior manufactures many proprietary designs of sanitary pumps, valves, clamps, and other fittings; their components are well-known and widely used throughout North America. Many of the company's most successful installations owe their success to innovative use of TCI-Superior's designed components.

The company is particularly strong in prefabrication. Many systems are designed to be built in the plant, tested, then partially dismantled and shipped to the point of use. Prefabrication techniques enable TCI-Superior to achieve higher standards of



TCI-Superior, together with Chemetron Inc. of Louisville, Kentucky, undertook the design, manufacture, supply and installation of a system to concentrate and aseptically process yogurt fruit topping.

workmanship than can be expected in the field, and help reduce disruption while the new system is being installed. TCI-Superior has designed, built and installed a complete dairy in only four and one-half months.

TCI-Superior is also a world leader in UHT liquid processing system technology. The revolutionary DASI System[®] introduced new standards of freshness and flavour to extended life and shelf stable UHT milk, as well as UHT processed soft ice cream, mixes, juices, and specialty food products. Most recently, the company is involved at the development stage in biochemical processes for food production, such as the production of amino acids from waste materials.

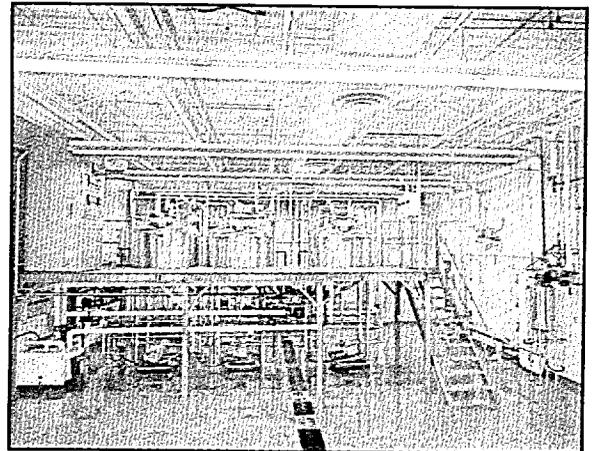
INTERNATIONAL EXPERIENCE

Almost as many TCI-Superior installations can be found outside Canada as within its borders. The company's prefabrication techniques, involving skid-mounted sub-systems, make best use of available transportation methods to cut assembly and installation costs.

The company's work can be seen in distilleries, dairies, breweries, food processing and manufacturing plants in Canada and in the Caribbean, in South America and the USA, in Europe and as far afield as Fiji. Installations range from small multi-purpose dairies to some of the largest automated liquid processing and automotive plants in North America.

INFORMATION

Enquiries are welcome and may be directed to:
John Brett
Executive Vice-President



The DASI free falling film principle is incorporated in a packaged, skid-mounted system designed for flexibility in application and ease of operation.

Canadian Livestock Exporters Association

P.O. Box 342, Brantford, Ontario N3T 5N3 Tel.: (519) 756-8300 Telex: 061-81139

WHAT IS C.L.E.A.?

C.L.E.A. (Canadian Livestock Exporters Association) is an association of Canadian livestock exporting firms primarily concerned with the export of live animals. The Association's aims are:

1. To gather and disseminate information on business conditions and developments within the industry.
2. To ensure a high standard of service to buyers and sellers, and to maintain high ethical standards among exporting firms, through rigorous application of standard sales practices and a code of sales ethics.
3. To represent the interests of member livestock exporters, and through them the industry, on matters of transport, health, finance, insurance, and other relevant matters. This goal is achieved through frequent and regular meetings with other appropriate organizations or groups, often including various departments and levels of government.
4. To act as an avenue of mutual assistance in the development of markets, and in the handling of large orders.

WHO ARE C.L.E.A. MEMBERS?

C.L.E.A. is composed of eleven Canadian export firms located in four provinces. For a complete list, please consult the Directory section of this issue.

WHY DEAL WITH C.L.E.A.?

C.L.E.A. offers potential international customers an opportunity to select a firm with financial integrity and extensive experience to handle their requests. The fact that several importing firms can buy for several markets from a variety of exporters assures fair pricing as dictated by prevalent conditions. A code of ethical sales practices ensures customer satisfaction and security.

EXPORT SALES BY C.L.E.A. MEMBERS

Since its inception in 1974, more than 87,825 animals have been exported to 48 countries around the world by C.L.E.A. members. This represents a high percentage of off-shore Canadian livestock export sales. The worldwide influence of C.L.E.A. members is illustrated by the data in Chart A, which shows sales results for 1985 by country and Chart B, which shows the number of animals shipped by C.L.E.A. yearly since 1974.

TRAVEL AND PROMOTION BY C.L.E.A. MEMBERS

C.L.E.A. members and their staff travel extensively to promote Canadian livestock around the world. Every effort is made to follow leads and explore possibilities in every country where there is a potential for import of Canadian livestock.

PARTICIPATION IN TRADE MISSIONS

Members of C.L.E.A. are available to participate in both federal and provincial trade missions in countries where Canadian livestock sales are on-going or in negotiation. With their knowledge of world markets and their expertise in export procedures, C.L.E.A. members have contributed significantly to the success of a great many international trade missions.

INTERNATIONAL EXPERIENCE

C.L.E.A. has exported to the following fifty countries: Angloa, Argentina, Australia, Bahamas, Belgium, Bermuda, Brazil, Bulgaria, Colombia, Chile, China, Costa Rica, Cuba, Czechoslovakia, Dominican Republic, Ecuador, France, East Germany, West Germany, Ghana, Hungary, Iran, Iraq, Italy, Jamaica, Japan, Kenya, Korea, Kuwait, Martinique, Mexico, Morocco, Mozambique, Netherlands, Nicaragua, Nigeria, Peru, Poland, Portugal, Russia, Saudi Arabia, Spain, Swaziland, Sweden, Switzerland, Tunisia, United Kingdom, United States, Uruguay, Venezuela.

CHART A - EXPORTS BY C.L.E.A. PER COUNTRY (1985)

Argentina	1	Mexico	6,678
Australia	1	Netherlands	5
Brazil	51	Nicaragua	1,518
Bulgaria	68	Peru	117
China	86	Saudi Arabia	748
Czechoslovakia	129	Spain	3
Ecuador	268	Sweden	20
France	76	Switzerland	1
West Germany	3	United Kingdom	43
Hungary	3	United States	3,070
Italy	28	Venezuela	1,458
Japan	70		

TOTAL NUMBER OF HEAD EXPORTED IN 1985: 14,445

TOTAL NUMBER OF COUNTRIES IN 1985: 23

CHART B - NUMBER OF ANIMALS SHIPPED BY C.L.E.A. PER YEAR

1974	4,991
1975	5,361
1976	9,404
1977	6,195
1978	6,778
1979	5,323
1980	2,771
1981	7,056
1982	12,904
1983	11,666
1984	6,624
1985	11,375
TOTAL	90,448

FOR MORE INFORMATION

Please direct all enquiries to:
Ms. Maria Luchtenberg
Export Manager
C.L.E.A.

SPECIALIZATION

Chipman formulates and markets a complete line of crop protection chemicals servicing both the farm and consumer market needs for weed, insect and disease control.

THE COMPANY

Chipman is the largest formulator and distributor of crop protection products in Canada. A Business Unit of C-I-L Inc.; Chipman has been in business for more than fifty years. Since 1954, the company has pursued the development of its own seed treatment technology, pioneering non-mercurial formulations such as AGROX N-M and introducing unique treatments to the North American market. Seed treatment development continues today with Chipman enjoying a worldwide reputation for formulation excellence. Chipman's head office is located at Stoney Creek, Ontario along with its modern production facilities.

ACTIVITIES AND PRODUCTS

Chipman provides quality formulated seed protection products worldwide. This specialty segment of the agri business market is one of great importance to the company. Formulations are available for corn, soybeans, cereals, canola, potatoes, peas and beans. Principal brand names AGROX, AGROSOL, GRANOX, GRANOL, MERGAMA and GAMMASAN service these crops.

AGROX D-L Plus is a dual purpose insecticide-fungicide corn seed treatment designed specifically for on-farm applications with sophisticated planting equipment. This economical seed protectant has met with wide acceptance across the North American market.

AGROSOL POUR-ON is our newest addition to the product line. It offers broad spectrum disease control for soybeans. This unique formulation combines several features to benefit the applicator — coverage, drying time, colour and plantability. This is then packaged in a unique self-measuring container designed for application rate accuracy.

All Chipman formulations are carefully designed with the end user in mind. Plantability and ease of application are of equal importance to the farmer as is how well the product performs controlling insects and disease.

INTERNATIONAL EXPERIENCE

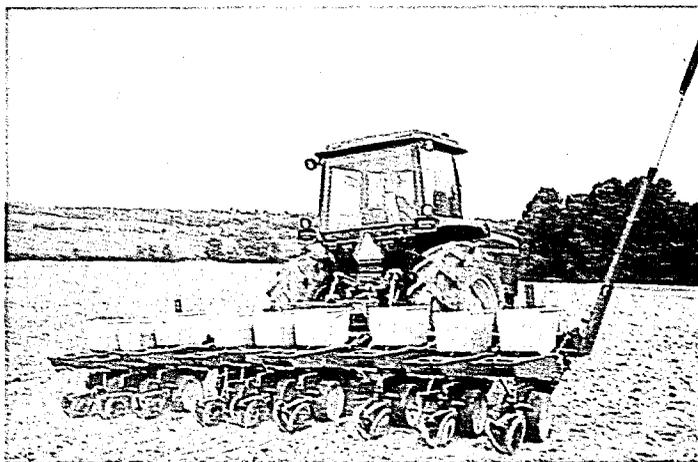
The major export market for Chipman currently lies in the United States. The unique features that have made seed treatment products successful in Canada are contributing to the growing success in the United States.

In 1985, Chipman also exported products to the United Kingdom and Africa. This trend is expected to continue as acceptance of Chipman products grows.

FOR INFORMATION

For further information, please contact:

J.S. Gilmore
Business Manager
CHIPMAN
P.O. Box 9910
Stoney Creek, Ontario
L8G 3Z1
Tel.: (416) 643-4123



Veterinary Infectious Disease Organization

124 Veterinary Road, Saskatoon, Saskatchewan S7N 0W0 Tel.: (306) 966-7465

SPECIALIZATION

For the past twelve years, the Veterinary Infectious Disease Organization (VIDO) has been serving the Canadian livestock and poultry industries by conducting applied research on the prevention and control of common infectious diseases in cattle, swine and poultry.

THE COMPANY

Canadian livestock operators and veterinarians identified the need for an organization whose research programmes would be responsive to the needs of livestock and poultry industries. Such a research laboratory would also act as the bridge between basic scientific discoveries in the laboratory and their application on the farm.

The Devonian Group of Charitable Foundations (Calgary, Alberta), through the Science Council of Canada, responded to this need and investigated such a research facility. In September, 1975, the Devonian Group signed an agreement with the governments of Alberta and Saskatchewan and the University of Saskatchewan to establish VIDO.

Located at Innovation Place at the University of Saskatchewan (Saskatoon, Saskatchewan), VIDO's 36,000 square foot facility contains offices, laboratories, a media preparation area, specialized animal isolation rooms and germ-free isolation units. Over one-half of the building space is devoted to the unique and specialized animal isolation facilities. These provide VIDO with the flexibility and containment that is integral to infectious disease research of food animals. VIDO also has access to a feedlot facility for field trials.

In 1983, VIDO joined with the University of Saskatchewan in establishing Biostar Inc. Biostar is a federally incorporated company that acts as VIDO's commercial agent in facilitating the development and marketing of VIDO's technologies and products. For example, Biostar was responsible for an agreement with Langford Laboratories Ltd. (Guelph, Ontario) to commercialize Ecolan, an *E. coli* subunit vaccine for calf scours. Biostar has also identified commercial opportunities in related areas such as obtaining contracts with multinational biological production companies for contract research and product testing.

ACTIVITIES AND PRODUCTS

VIDO is a unique and innovative Canadian research and development organization with a proven track record. In 1975, VIDO identified bovine neonatal diarrhea or "calf scours" as the organization's initial research target. In 1978, VIDO's efforts culminated in a major scientific breakthrough with the discovery of VICOGEN, the world's first, safe and effective vaccine for the prevention of enteropathogenic *E. coli* calf scours.

VIDO has made several other noteworthy accomplishments in diverse areas of activity, including the following:

- a) world class vaccines;
- b) monoclonal antibodies;
- c) preventive medicine information;
- d) housing design;
- e) product testing;
- f) international symposia;
- g) technology transfer to the livestock industry;
- h) technology transfer to the commercial sector.

INTERNATIONAL EXPERIENCE

VIDO's VICOGEN vaccine has been successfully marketed (by Connaught Laboratories Ltd., Toronto, Ontario) in several countries including the United States, Mexico, Brazil and Israel. In addition, the organization holds international symposia on such topics as respiratory diseases of cattle and pigs and neonatal diarrhea.

INFORMATION

If you would like additional information on VIDO, please contact:

Dr. S.D. Acres, Director or
Mr. P.G. Hodgman, Executive Officer

Oseco Inc.

P.O. Box 219, Brampton, Ontario L6V 2L2 Tel.: (416) 846-5080 Telex: 069-7535 Cable: OSECOSEED



SPECIALIZATION

Oseco Inc. is a leader in forage seed multiplication and in the export of Canadian-grown commercial seed and public varieties.

THE COMPANY

The company was founded in Canada in 1939 by the late John Eros, a Hungarian emigrant who brought with him a complete line of new seed cleaning equipment and a highly specialized knowledge of the industry.

Originally known as Ontario Seed Cleaners & Dealers Ltd., located in Toronto, Ontario, the firm soon gained a reputation as a specialized forage seed processor. The business grew quickly in scope and size and in 1967, in order to accommodate this rapid growth, the company moved to new facilities just outside Toronto, and began using a new corporate name, Oseco Inc. The Brampton plant, with its 45 employees and its highly innovative and automated design, quickly established Oseco as a leader in forage contract seed production and processing and wholesale distribution, both in the North American and worldwide markets.

ACTIVITIES AND PRODUCTS

There are many good reasons why seedsmen and breeders around the world look to Oseco for seed multiplication: the firm provides the service they need, from beginning to end.

Most of Oseco's contract multiplication of grass and clover seed takes place in Western Canada. These areas provide ideal clean land conditions and climate for seed production of Timothy, Creeping Red Fescue, Meadow Fescue, Orchardgrass, Ryegrass, Alfalfa, Red Clover, Alsike Clover and Birdsfoot Trefoil.

Oseco's branch offices in Western Canada manage multiplication contracts of various forage seeds for customers around the world. The selection of seed growers, the planting of stock seed, growing and harvesting of these special varieties is closely supervised by Oseco's own fieldmen. The harvested seed is then shipped to the modern cleaning plant in Brampton where it is cleaned, packed and certified for international customers.

Periodic reports are issued regularly to keep customers informed of each stage of their variety multiplication.

Oseco's Brampton operation has a seed testing laboratory fully accredited by the Government of Canada. Rigid quality control ensures that the seed is cleaned in accordance with customer's individual specifications.

Recently, Oseco started a new program for the development, production and marketing of early corn hybrids (70 to 100 days).

Oseco is a full member of the Canadian Seed Trade Association and its Seed Multiplication Division.

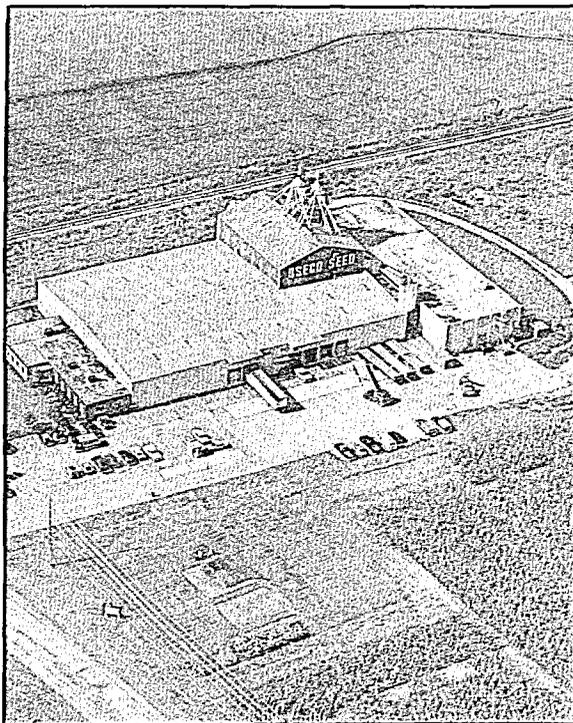
Oseco is also a founding member of Secan, a new organization formed to commercialize varieties developed by Canada's public breeding institutions.

INTERNATIONAL EXPERIENCE

Oseco is proud of its many accomplishments within the forage seed industry. For example, Oseco originated the shift to bulk movement of seed across Canada, utilizing rail hopper cars. Oseco was the first in contract multiplication of forage crop seed with improved varieties for export under the OECD (Organization for Economic Co-operation and Development) Scheme for international certification. Oseco recognizes that only research will give the industry even better varieties for the future. Along with forage research projects in Canada, Oseco has co-operative research projects in the United States and Europe. Plant genetics and their improvement have become a global effort. Plant material from around the world is constantly being evaluated. Oseco's overseas shipments move mostly in containers filled and sealed at the Brampton plant. Efficient shipping is one of the most vital links in the seed multiplication chain and the firm's shipping department works closely with established shipping lines to ensure that the seed reaches its destination on time and in top condition.

INFORMATION

Further information on Oseco can be obtained by contacting:
Gabriel Eros
General Manager
Oseco Inc.



Oseco's Brampton head office.

SETL Embryo Transplants

R.R. No.5, Saskatoon, Saskatchewan S7K 3J8 Tel.: (306) 373-4050

SPECIALIZATION

SETL has been in the bovine embryo transfer business since 1975.

THE COMPANY

In the early 1970s, Dr. Albert Mills felt he could successfully flush embryos from a cow using a non-surgical technique he had developed. At that time the few collections that others were performing were all surgical, which left a host of problems. A group formed in Saskatchewan, built a facility meeting Dr. Mills' requirements and gave him a chance.

He was successful and the entire industry has since followed the firm in using a non-surgical flush method. The group that formed was the beginning of SETL Embryo Transfers.

SETL is North America's oldest non-surgical embryo collector.

ACTIVITIES AND PRODUCTS

SETL offers an extensive range of services including:

- non-surgical collection;
- freezing;
- storage;
- preparation for export;
- surgical and non-surgical implantations;
- splitting (micro-surgery producing twins);
- recipients.

In addition, the firm's research into such areas as sexing, different methods of transfers and freezing, multiple micro-surgical divisions and work with other species of animals will ensure continued status as a world leader in the industry.

SETL can customize an E.T. programme to individual customers' budgets and herd requirements through its price structure and guarantee.

INTERNATIONAL EXPERIENCE

SETL's staff of veterinarians and technicians is among the most experienced in the industry; the result of its concurrent research programme and commercial E.T. programme. This has resulted in recognition from within the industry with election to office in the International Embryo Transfer Society, appointments as technical advisors to Canadian government international trade missions and requests for contributions to several publications.

Nations wishing to gain access to Canadian dairy and beef animals are invited to utilize the service and contacts of SETL. The firm has access to some of the best dairy and beef stocks in the world and has the expertise to prepare embryos from these stocks to meet the import requirements of any nation.

SETL is also prepared to provide instruction on the latest transfer techniques to countries wishing to develop embryo transfer programmes. SETL has the benefit of years of experience plus access to the large numbers of research animals required for training.

Embryo transfer is rapidly overtaking shipment of mature cattle as an import/export method. Large numbers of frozen embryos can be transported very inexpensively over large distances. Calves born to native cows from embryo transfers have the combined benefit of desirable genetic traits plus immunity acquired from the native recipients to indigenous diseases.

INFORMATION

Please direct all enquiries to:
Blaine Canitz, P.Ag.
General Manager

THE MISSION

The National Research Council's Biotechnology Research Institute (BRI) was created to act as a centre of excellence dedicated to biotechnology research aimed at industrial development. Its mission is to conduct generic research, oriented towards industrial development. It acts as a research catalyst and communications centre, a bridge between industry and universities.

THE OBJECTIVES

The permanent objectives of the Institute are:

- 1) to carry out research and development activities in areas chosen, in consultation with industry and public organizations, as being the most important to Canada's economic development;
- 2) to invest, in cooperation with Canadian industry, in fields where private sector financing of research activities could not be justified;
- 3) to promote research and development in industries where biotechnological products and processes offer better substitutes;
- 4) to foster joint research projects with industry, universities and other research facilities.

The Institute employs some 200 scientists and technicians and supports up to 80 guest workers from the industrial sector. It also accommodates and welcomes visiting scientists from industries, international agencies and universities. In addition to its world-class laboratories, it has large modern fermentation and pilot-plant facilities available to industry.

MANDATE AND AREAS OF RESEARCH

MANDATE:

- Applications in the agriculture, food products, forestry and chemical sectors.
- Waste treatment and chemical engineering.
- Pharmaceutical research.
- Making its facilities available for private industrial research.

AREAS OF RESEARCH

- Biochemical engineering: bio-reactor design, operation, separation and purification processes.
- Applied microbiology.
- Genetic engineering; chemical or biological synthesis of DNA and RNA.
- Enzyme engineering: protein characterization.
- Cell fusion and molecular immunology.

INFORMATION

For information concerning the Biotechnology Research Institute, contact:

Dr. Maurice Brossard

Vice-President, Biotechnology and Chemistry
National Research Council Canada

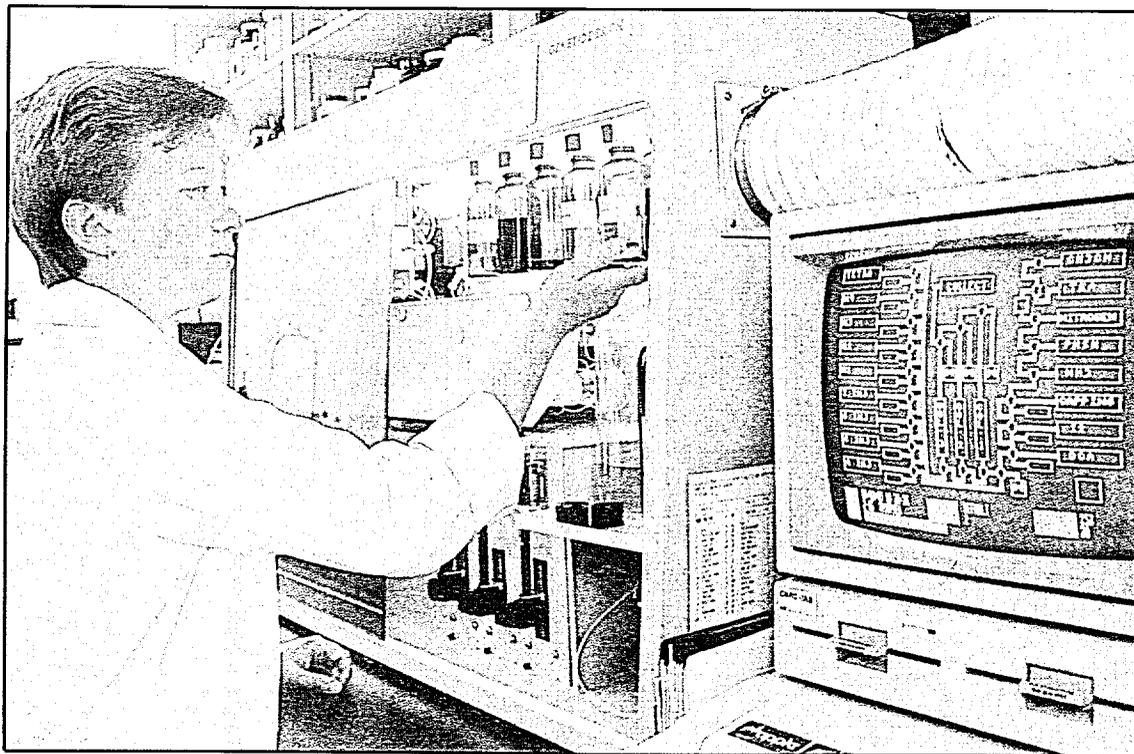
Ottawa, Ontario

K1A 0R6

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Ottawa: (613) 993-1200

Montreal: (514) 283-4151



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SOIL MANAGEMENT IN CANADA

The relentless forces of wind and rain which sweep millions of tonnes of soil off Canadian farms every year are a constant reminder of the fragility of one of our most valuable natural resources.

Since its beginning a century ago, Agriculture Canada's Research Branch has been tackling the serious and costly problem of soil degradation by developing new agricultural techniques and adapting old methods to solve modern-day problems.

Because of its northern latitude, Canada has relatively short growing seasons. It also has soil formation processes, such as the decomposition of organic material, which operate slowly. Thus, Canada's mantle of topsoil is thin - an average of 20 to 25 centimetres - and vulnerable to both man-made and natural abuses.

The main problem is that so much soil is being lost every year through erosion; it would take literally hundreds of years for nature to rebuild it. In addition, there is other damage such as loss of nutrients and soil structure.

Last year, Agriculture Canada's Research Branch allocated more than \$5 million to research on soil and water management and conservation. In some projects, it combined forces with other Canadian agencies such as the Prairie Farm Rehabilitation Administration. The branch also works to define the extent of soil degradation with soil inventories, which were originally prompted by the dust bowl of 50 years ago.

Through these inventories, farmers and planners can find out which of 2,000 types of soil an area has, what it is best suited to grow, how productive crops are likely to be, the probability of flooding or erosion, and the possibilities for non-agricultural uses ranging from pipeline construction to housing development.

The Research Branch works with the provinces to establish joint programmes in soil surveying and conservation. Joint projects have been undertaken with Prince Edward Island, Nova Scotia, New Brunswick, Manitoba and Saskatchewan.

Canadian farmers are aware of the problems of soil degradation, but many of the solutions are costly. The agricultural community has turned to the practise of farming systems which are cost-effective, which do not result in lost production and which arrest degradation.

In both the eastern and western regions of Canada, the preferred method of conserving land is by biological methods, as opposed to so-called engineering methods such

as terracing. Crop rotation, for example, can make a big difference in soil protection.

Planting a forage crop on a wheat field that might otherwise be left fallow once every two or three years will reduce erosion, and in some cases, even restore nutrients such as nitrogen to the soil.

Another biological method of saving soil is to plant another crop after harvest. In Prince Edward Island, rye is often grown after potatoes are harvested so the soil is not left bare and vulnerable to erosion.

Western farmers frequently practise summerfallowing to conserve water. Strips of high stubble or tall grasses can trap snow in the winter, which makes the soil more moist in the spring and allows planting, thereby avoiding wind erosion during the summer.

With extensive knowledge gained at home, Canadian soil scientists are well equipped to offer their expertise to find solutions to similar problems experienced in countries in all parts of the world. ■

THE CANADIAN APPROACH TO PEST MANAGEMENT

18

To reduce excessive reliance on herbicides and pesticides, the government of Canada has slated work on integrated pest management -- increasing the use of tillage and natural predators as a means of warding off bugs and weeds -- as a top priority.

The integrated pest management (IPM) approach to pest control makes it possible to protect crops and animals from insect pests, weeds and diseases, weaning farmers away from chemical use and cutting production costs.

IPM is a system that does not reject pesticides, but uses them at lower levels, combined with other measures.

These include using parasites and other insects that prey on pests, a technique pioneered in the early 1950s at the Kentville, Nova Scotia, federal research station, or genetic engineering to develop new, pest-resistant strains of crops.

Another aspect of IPM involves monitoring insect activity in order to time pesticide applications most effectively. According to scientists at Agriculture Canada's Research Branch, it is in this area that results have been most encouraging.

The fruit industry is one example. For many years, insect monitoring has been gaining widespread acceptance among growers in both the Okanagan Valley of British Columbia and Ontario's Niagara region.

IPM techniques first began to take a foothold throughout the Okanagan in 1978. Prior to this, the "calendar" approach was used. Pesticides were applied at certain times regardless of whether pests were actually a problem or not.

The integrated approach, in contrast, monitors insect activity in the orchard to determine the best time to apply pesticides. Dramatic results in controlling codling moths have been achieved by using pheromone traps. Pheromones are sex hormones which fool the males into thinking a female is present.

Several years of using this technique in Canada have shown that the number of pesticide applications needed to control the codling moth can be cut in half, compared to standard practices.

Canadian grower acceptance has also been encouraging. More than 50% of Canada's apple growers are now using the pheromone traps to monitor codling moth populations.

From the growers' point of view, the benefits are many and include greater accuracy in timing spray applications, lower production costs, and better conservation of beneficial parasites and predators.

In the apple orchards of Ontario, IPM programmes have been around for many years. Currently, about 90% of the province's apple growers are using integrated controls, directed at such pests as the codling moths, tentiform leaf miner, European red mite, and several species of leafrollers.

Provincial statistics show a 25% reduction in pesticide use in current programmes, for a net savings to growers of \$100 per hectare.

Evidence points towards IPM as the only approach to pest management that can protect crops, reduce pesticide use, and address consumers' concerns.

Based on encouraging results in the fruit industry, Canadian government officials would like to see an integrated approach developed for all the major commodities.

Canadian agricultural professionals look forward to sharing their findings in this sector with the international farming community and exchanging information with their international counterparts. ■

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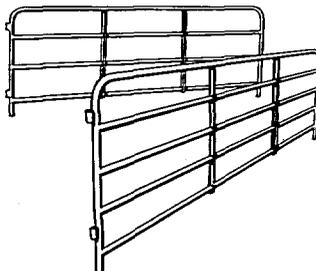
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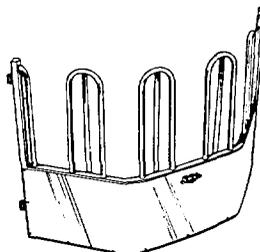
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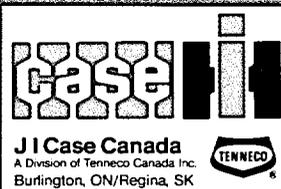
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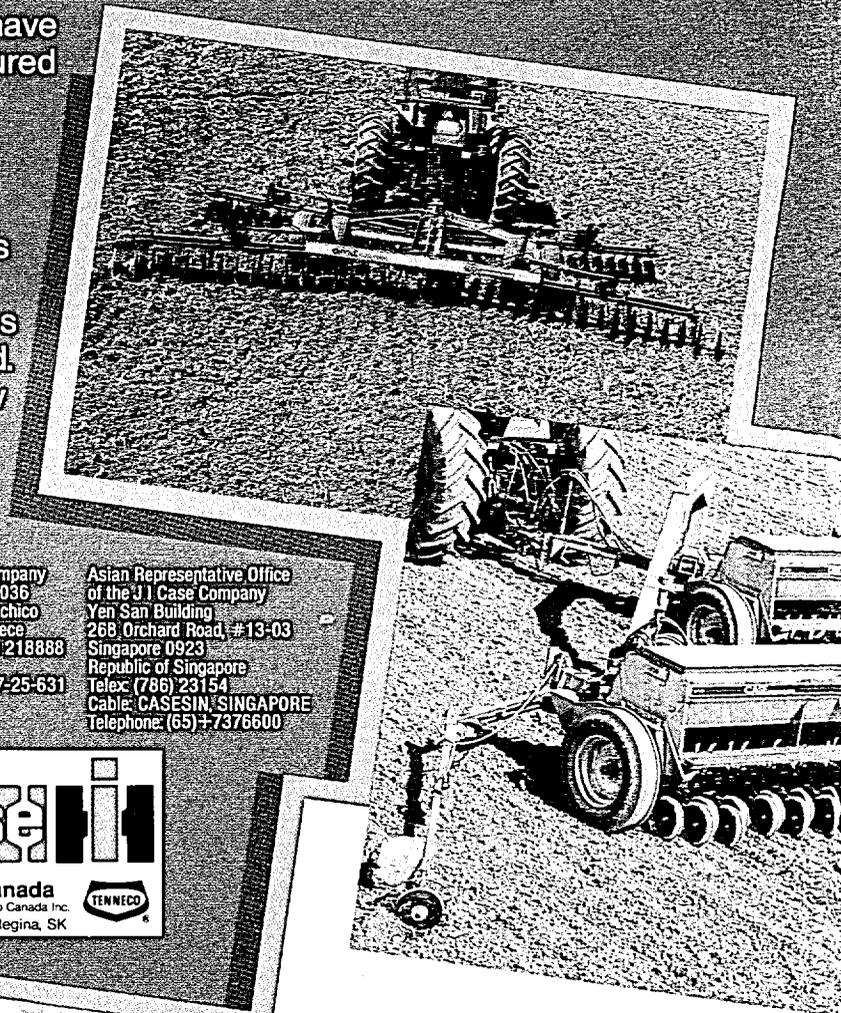
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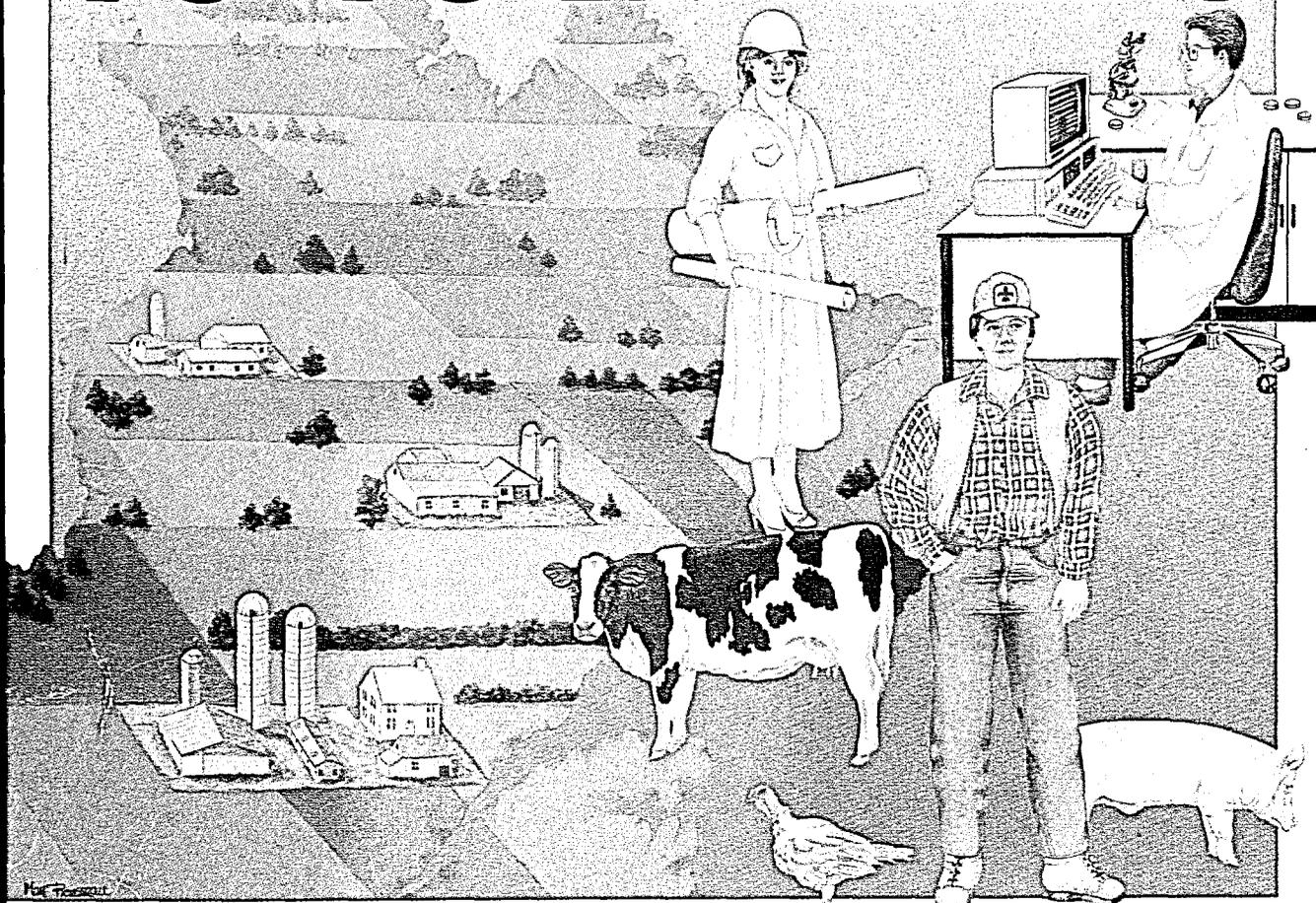
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