Royal Commission
on Canada's Economic Prospects

The Canadian Agricultural Machinery Industry

by J. D. Woods & Gordon Limited

THE CANADIAN AGRICULTURAL MACHINERY INDUSTRY

By J. D. WOODS AND GORDON, LIMITED

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While authorizing the publication of this study, which has been prepared at their request, the Commissioners do not necessarily accept responsibility for all the statements or opinions that may be found in it.

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EXHIBITS

1

HISTORICAL BACKGROUND

While the size and composition of any industry are influenced by past trends and events, this has been so to a marked degree in the case of the agricultural machinery industry in Canada. The progress of the industry has not followed a uniform course of expansion, but has been, and in fact still is, uneven and variable. It has been subject to extremes in its fortunes, and in the number and size of its members.

Emerging from the blacksmith shop during the first half of the 19th century, the industry comprised some 250 small companies by 1875. The next 50 years were ones of broad expansion paralleling the development of the western wheat economy. During this period, and in common with many other industries, the small shop began to disappear and the larger companies began to dominate the scene.

During the depression in the early 1930's the industry suffered more seriously than did most other industries. After World War II it entered a period of great change and expansion.

The main elements influencing the industry during the four distinct periods comprising its history are reviewed under the following headings:

(1) Early Development	1800-1875
(2) Broad Expansion	1875-1929
(3) Economic Depression	1929-1939
(4) War and Postwar	1939-1956

Period of Early Development 1800-1875

The evolution from the small shop to the factory was retarded by the limited market. Unable to pioneer innovations, engage in specialized production, or to attract substantial capital, the industry in Canada was forced to

depend almost entirely on the United States for technical guidance and for the development of new products

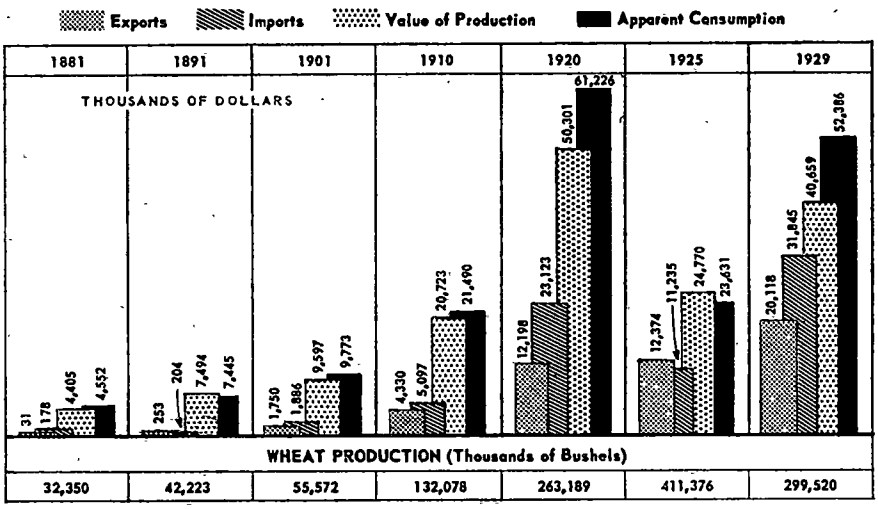
Until about 1875 the needs of the country for agricultural implements were filled almost entirely by the domestic industry. This was in spite of the fact that the first tariff on agricultural implements was not imposed until 1847. Even then, being set at 10%, it was not prohibitive. The reasons for the absence of competition in the Canadian market lay mainly in the lack of adequate transportation between Canada and the United States, the elementary nature of the implements of the time, the need for local repairs, and the lower cost of labour and of certain materials. Also the market was too small to be significant. The first census in 1861 listed 46 agricultural implement companies with combined annual sales of $413,000.

The next decade was marked by such rapid expansion that by 1871 there were 252 companies in operation with sales of $2,685,000. This growth was stimulated by the effects of the American Civil War, the high price of wheat and the shortage of farm labour. During this period also sales increased because of the growing popularity of agricultural machinery, especially those types used in reaping. The replacement of the "implement" by the "machine" foreshadowed the end of an era. This period also saw some "dumping" of United States machinery on the Canadian market following the Civil War. Possibly related to this latter condition was an increase in tariff in 1874 bringing the total to 17½%.

Period of Broad Expansion 1875-1929

The following table shows the rate of growth of the industry during its half century of basic expansion. The expansion in wheat production during this period is shown in the same table.

EXPORTS, IMPORTS, PRODUCTION, AND APPARENT CONSUMPTION OF AGRICULTURAL MACHINERY – CANADA 1881 to 1929



There can be no doubt that the key element in the expansion in sales was the great development of the western wheat economy, made possible only by the use of machines in farming. However, there were other factors which should not be ignored, especially as their influence continued after acreage under wheat had become relatively stable. The continued growth of mechanization on the farm and the growth of population are examples and, of course, the use of tariffs to assist the young industry was of great importance.

During the early part of this period the industry had substantial tariff protection. In 1879 the tariff was increased from 17½% to 25%, and in 1883 to 35% as part of the "National Policy" of the Government of that day. In 1894 the tariff was lowered to 20% where it remained until 1907. In the next few years there were further decreases and by 1922 the rates on most items ranged from 6% to 7½% where they remained until 1930. Undoubtedly the 11 years of high tariff, 1883 to 1894, preceded and succeeded by periods of lower but substantial import duties, were of great significance, in view of the development of the United States industry and the accessibility of the Canadian market to it.

That this tariff protection was not prohibitive is evidenced by the marked increase in imports from the United States. Such imports amounted to only $146,000 in 1890 but by 1929 they had risen to $31,895,000. There were three important reasons for this growth viz.:

(1) Most of the agricultural machinery industry in the United States was established immediately to the west of Chicago. This provided a freight advantage on shipments to western Canada until Canadian freight rates from eastern Canada were made competitive in 1919. In the early part of the 1875-1929 period most imports of United States agricultural machinery went to western Canada, while the high tariff served to protect the market in eastern Canada.

(2) The season for selling agricultural implements in the United States is in advance of that in Canada. This condition provided an opportunity to the United States industry to sell surplus machinery in Canada at low prices

(3) Until about 1870, Canadian manufacturers could obtain iron and steel from England more cheaply than they could from the United States. With the development of the Bessemer process and the discovery of the Mesabi iron range this advantage disappeared. By about 1895 Canada was importing more iron and steel from the United States than it was from England.

The period 1875 to 1929 witnessed the development of the important Canadian agricultural machinery companies and a lessening of their depen-

dence on the United States industry for technical guidance. Commencing about 1885 certain amalgamations in both countries led to the eventual emergence of a small number of relatively large "full line" companies.

In Canada the most important merger was that of A. Harris, Son & Company and the Massey Manufacturing Company in 1891. Prior to amalgamation these companies had together accounted for about 50% of the agricultural machinery production in Canada. Subsequently, the new company acquired a number of smaller concerns in order to provide a full line of agricultural machinery. In 1903 the International Harvester Company established a plant in Hamilton, Ontario. This move was made primarily to overcome the 20% duty then in effect.

The Cockshutt Plow Company was the third large company to expand during this period. This company had originally specialized in manufacturing ploughs which were sold largely to the Harris Company. The company lost this market when Massey-Harris purchased the Verity Plow Company in 1891. The Cockshutt Company, with its limited number of lines, had difficulty in marketing its products until it purchased an interest in Frost & Wood in 1909. This purchase added harvesting machinery to the Cockshutt lines. In 1912 Brantford Carriage Ltd. and Adams Wagon Company were acquired to further broaden the range of products.

These three companies—Massey-Harris, International Harvester and Cockshutt—became known as the "Big Three" of the implement manufacturing industry in Canada—a position they still hold.

In 1911 the John Deere Plow Company of Moline, Illinois purchased the Dain Manufacturing Company of Welland, Ontario, but this operation was, and still remains, small in comparison with the companies mentioned above.

The Massey Company and the Harris Company both entered the export market to a limited degree in the late 1880's. Following amalgamation, the Massey-Harris Company moved actively into the export field and set up sales agencies in South America, England, France, Germany and Australia. This company was the only large exporter until International Harvester opened its plant in Canada in 1903.

Exports of agricultural machinery increased rapidly over this 40-year period as may be seen from the table on Page 2. These exports went very largely to European, British Empire and South American markets. Several factors induced Canadian manufacturers to export agricultural machinery to these markets at the turn of the century, viz.—

(1) Most of the newer types of farm machinery were developed in the United States and Canada and the plants in these countries were the best equipped to meet the demand in other countries.

(2) The cost of labour was rising, particularly in Europe. This created added interest in agricultural machinery in that market.

(3) Canadian manufacturers, uncertain whether the Canadian tariff would be continued, wished to develop alternative markets.

(4) By selling in foreign markets, Canadian manufacturers were able to offset some of the disadvantages of seasonal sales in Canada.

Until 1913 the market in the United States was highly protected. Duty on most agricultural machinery imported into the United States amounted to 45% until 1897 when it was reduced to 20%. In 1909 the rate was decreased to 15%, and in 1913 all United States import duties on agricultural machinery were removed. While the Canadian manufacturers continued to export mainly to Europe, South America and Australia after 1913, they also developed some interest in the United States market. In 1910 the Massey-Harris Company purchased the Johnson Harvester Company of Batavia, New York. Although this relatively small company was acquired primarily to supply extra productive capacity for overseas exports, it provided the beginning of a distributing organization for Massey-Harris in the United States.

A most significant element in the growth of the industry, and in its relationship to agricultural methods, was the introduction of the farm tractor. Tractors first made their appearance in Canada in about 1910 as imports from the United States. They found ready acceptance and expanding use. In the early stages the largest share of the Canadian market was supplied from the United States factories of the International Harvester Company. In 1917 the Ford Motor Company commenced the production of tractors in the United States and started exporting a substantial number to Canada.

About this time both Cockshutt and Massey-Harris found it increasingly difficult to sell their implements without an accompanying line of tractors. In 1919 Massey-Harris commenced to build tractors in Canada. This enterprise had indifferent success, especially in view of the fact that the duty on tractors valued at less than $1,400 was discontinued at about the same time. The project was abandoned in 1923 after a relatively small number of tractors had been produced. However, in 1927 Massey-Harris purchased the J. I. Case Plow Company of Racine, Wisconsin, which had developed a well established range of tractors. Thereafter, Massey-Harris was able to meet its requirements for tractors in both countries from this source. In 1928 Cockshutt entered the domestic tractor market by importing tractors from Allis-Chalmers & Company in the United States, but this arrangement was discontinued after about two years. It will be noted from the foregoing that the Canadian tractor market was supplied almost exclusively from the United States. With only a few minor exceptions that situation has continued to the present time.

The years 1875 to 1929 can well be regarded as the period in which the Canadian agricultural machinery industry became firmly established and demonstrated its ability to compete in both domestic and overseas markets. The acquisition of factories in the United States also saw the beginning of limited Canadian participation in that market.

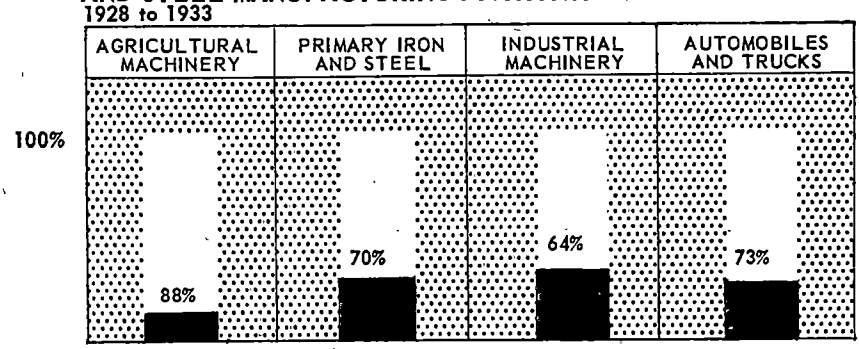
Period of Economic Depression 1929-1939

The effects of the depression, severely accentuated by drought in western Canada, were almost disastrous for the industry. Sales dropped from about $41 million in 1929 to about $5 million in 1933. Over the same period, imports dropped from about $40 million to about $2 million.

In an attempt to alleviate the plight of the industry the Canadian import tariff on agricultural machinery was increased to 25% in 1930. In the light of the very great reduction in total sales, it is impossible to assess the effect of the higher duty on imports. On the whole it is apparent that the dominant factor was the depression itself.

In spite of the virtual elimination of imports the industry suffered even more severely than did other principal, and somewhat comparable, divisions of the iron and steel industry in Canada. The following table shows this clearly:

DECREASE IN PRODUCTION OF PRINCIPAL CANADIAN IRON AND STEEL MANUFACTURING DIVISIONS.
1928 to 1933



As a further commentary it may be noted that during the same period employment in the agricultural machinery industry declined by 75% as against a drop of 51% for the Canadian iron and steel industry as a whole.

The universal extent of the depression added to the difficulties of the agricultural machinery industry in the early thirties, through the resulting curtailment in exports. During the late 'twenties from 35% to 50% of the agricultural machinery made in Canada was exported. Individual companies frequently exceeded these figures. As a result of the depression many countries attempted to protect their domestic economies by increasing tariffs and

establishing quotas. These actions, coupled with exchange restrictions, almost eliminated Canadian exports which shrank from $20 million in 1929 to $1.5 million in 1933. This decrease was felt most severely by Massey-Harris as Cockshutt and International Harvester of Canada had not been as active in the export market.

In 1932 the Empire Preference agreements came into effect and Canadian exports of agricultural machinery to Commonwealth countries rose from $893,000 in 1932 to $5.5 million in 1940. Over the same period total exports increased from $2.5 million in 1932 to $9.5 million in 1940.

In 1935 the tariff on imported agricultural machinery was reduced from 25% to 12½% and in 1936 it was reduced again to 7½%.

Farm income improved slowly but steadily during the latter part of the 'thirties and the sales of agricultural machinery rose more or less proportionately. However, the total output of the industry had only risen to about 50% of the 1929 level when war broke out in 1939.

War and Postwar Period 1939-56

The coming of World War II found the industry weak from the effects of the depression and covering a much smaller market than it had once enjoyed, and a still smaller market than it was equipped to supply. The rationing of machinery required to conserve materials and man-power, called for restrictions in production ranging between 35% and 85% of the 1940 level for specific items. However, this was more than offset by war orders which made up roughly 65% of the total volume of production in the industry. Government contracts were the direct source of the expansion of manufacturing facilities, rehabilitation of equipment and buildings, and improvement in financial structure which occurred during the war period. As a result, the industry found itself in a stronger position to meet the pent-up demand for agricultural machinery in the postwar period, than might otherwise have been the case.

The seven years following the war were ones of unprecedented opportunity for the industry. Agriculture experienced dynamic changes, especially in North America. Scarcity of labour, high wages, inflationary trends and a rising world demand for the farm products of North America combined to produce a tremendous need for agricultural machinery and to stimulate technological innovations in that machinery. At the same time the rising prices of farm products provided the farmer with the means to buy equipment and to expand the area of mechanization.

Two significant events occurred during this period. One was the removal of the Canadian tariff on agricultural machinery in 1944. The other was the development, manufacture and wide distribution of the first successful self-propelled combine on the continent—a Canadian product introduced by

Massey-Harris. The absence of tariffs in either direction between Canada and the United States had the obvious effect of making the two countries a single market as far as this industry was concerned, and allowed the companies with plants in both countries to integrate all of their production facilities. The self-propelled combine, which was the first relatively high-priced piece of agricultural machinery to be produced in Canada, added $40 million to $50 million per year to the value of Canadian production, much of which was exported to the United States.

The very great gains in production following the war are shown below. It will be noted that between 1939 and 1952, the unadjusted dollar value of production increased by twelve times and that this production when expressed in constant 1939 dollars increased by more than six times.

PRODUCTION OF AGRICULTURAL MACHINERY IN CANADA

(THOUSANDS OF DOLLARS)

Production Production in 1939 Dollars

YEAR	COMPARISON OF VALUE	VALUE OF PRODUCTION	VALUE OF PRODUCTION IN 1939 DOLLARS
1939		16,035	16,035
1946		53,990	45,960
1949		169,617	108,000
1952		194,688	103,200
1953		159,851	83,600
1954		113,103	59,200

The peak in the unadjusted value of production which was reached in 1952 was not maintained and by 1954 it had dropped by approximately 40%. This drop was accompanied, and no doubt was accounted for, by a comparable reduction in farm income. The relationship between sales of agricultural machinery and farm income which is referred to later in this report may be seen in Exhibit I.

Summary of Tariff Changes

It will be noted that throughout the foregoing historical description there is interwoven a thread of numerous tariff adjustments. Because of the importance of these tariff changes to the industry, they are summarized below and are set out in chart form in Exhibit II.

Prior to 1875 tariffs were of negligible importance. The sales of agricultural machinery were small and the various implements were supplied to a great extent locally by local makers.

From 1880 to 1914 substantial tariff protection was afforded a developing and expanding industry. It was in this period that the large Canadian-

controlled companies, Massey-Harris and Cockshutt, emerged and grew to substantial size. This high tariff period also saw the two United States companies, International Harvester and Deere, locate plants in Canada.

Between 1907 and 1930, there were several specific tariff reductions which varied by class of machine. By 1924 the tariffs had been reduced to a range of from 6% to 10%, except in the case of the larger tractors which carried a rate of 17½%.

The effect of this gradual withdrawal of protection was in some measure offset for the Canadian industry by the removal of all duties on materials and tools required for the manufacture of agricultural machinery. In addition, certain freight-rate concessions were granted in 1919 on shipments from eastern to western Canada.

The plight of the industry during the severest of the depression years led to a marked reversal of tariff policy and a protective tariff of 25% was introduced in 1930. The one exception to this was the category of tractors under $1,400 in value which remained free of tariff.

In 1935 the tariff policy on agricultural machinery imports was reversed once more. In that year the tariff was reduced to 12½% and in 1936 to 7½%. In 1944 all duties on agricultural machinery were removed.

2

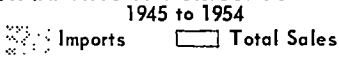
IMPORTS AND EXPORTS OF AGRICULTURAL MACHINERY

Imports and exports, having played such an important role in the history of the agricultural machinery industry, form an integral part of the historical background outlined above. However, in view of their particular importance at the present time they are dealt with in greater detail in the following pages.

Imports

In spite of the heavy increase in total production in Canada after World War II the total value of imports continued to be well above the value of the domestic output. The more recent relationships are shown in the following table:

SALES COMPARED WITH IMPORTS OF AGRICULTURAL MACHINERY IN CANADA
1945 to 1954



THOUSANDS OF DOLLARS

YEAR	40,000 80,000 120,000 160,000 200,000 240,000 280,000	TOTAL SALES	IMPORTS	PERCENTAGE OF IMPORTS TO TOTAL SALES
1945		82,433	50,435	61.2%
1946		102,525	68,351	66.7%
1947		145,671	105,404	72.4%
1948		197,663	139,993	70.8%
1949		245,194	177,210	72.3%
1950		248,049	161,642	65.2%
1951		264,393	195,082	73.8%
1952		281,509	197,266	70.1%
1953		269,869	209,143	77.5%
1954		174,039	143,163	82.3%

From this it can be seen that for the ten year period, 1945 to 1954, more than two-thirds of the Canadian market for agricultural machinery was supplied by imports. The figures suggest a rising trend.

The high proportion of agricultural machinery imports results largely from the fact that for many years about two-thirds of the total value of such imports has consisted of tractors. This is seen in the following table:

PERCENTAGE OF AGRICULTURAL MACHINERY IMPORTS INTO CANADA, REPRESENTED BY TRACTORS 1929 to 1953

Total Imports of Agric. Mach. | Imports of Tractors

THOUSANDS OF DOLLARS

YEAR	TOTAL IMPORTS OF AGRICULTURAL MACHINERY (20,000 40,000 60,000 80,000 100,000 120,000 140,000 160,000 180,000 200,000 220,000)	IMPORTS OF TRACTORS	Percentage of Imports Represented by Tractors
1929	31,845	21,581	67%
1939	20,917	15,002	71%
1945	50,435	33,038	66%
1949	177,210	118,504	66%
1953	209,143	126,294	60%

In order to present a relationship undistorted by tractor imports the following table shows a comparison of Canadian sales and imports of agricultural machinery with tractors excluded:

COMPARISON OF CANADIAN SALES AND IMPORTS OF AGRICULTURAL MACHINERY, OTHER THAN TRACTORS

1945 to 1954

(THOUSANDS OF DOLLARS)

SALES, Other than Tractors | IMPORTS, Other than Tractors

YEAR	(20,000 60,000 100,000 140,000 180,000 220,000 260,000 300,000)	SALES Other than TRACTORS	IMPORTS Other than TRACTORS	PERCENTAGE IMPORTS to SALES
1945		63,234	17,396	27.5
1946		78,404	22,728	29.0
1947		107,538	35,961	33.4
1948		142,542	51,323	36.0
1949		175,241	58,704	33.5
1950		187,128	53,322	28.5
1951		209,648	69,529	33.2
1952		230,300	78,044	33.9
1953		223,044	82,794	37.1
1954		143,050	60,350	42.2

It will be seen that, excluding tractors, imports account for roughly one-third of domestic sales. Here also the proportion of imports has risen in the most recent years shown in the table.

In the absence of tariffs these figures are not surprising. Certain large United States companies such as Ford Tractor and Equipment Co. Limited, Minneapolis Moline Co. Limited and J. I. Case Limited (not associated with J. I. Case Plow Company purchased by Massey-Harris in 1927) have extensive sales organizations in Canada but no manufacturing facilities in this country. Furthermore the fact that the border between the United States and Canada has little significance to the industry, has given rise to the practice of confining the production of a specific item to one plant, be it in the United States or Canada, by those companies with plants in both countries. This has led to a substantial interchange of products with a subsequent increase in both imports and exports. While it is not of great or continuing significance, recent strength of the Canadian dollar has given a slight competitive advantage to United States exporters to Canada.

Imported farm machinery comes almost exclusively from the United States. Several factors enter into this such as freight, maintenance of service, similarity of markets and practices, proximity to market, opportunity for research, and so on. Probably United States skill and opportunity in mass-production is the most important element.

Whatever the causes, the results are shown in the following table:

AGRICULTURAL MACHINERY IMPORTS INTO CANADA – 1953 ACCORDING TO COUNTRY OF ORIGIN

IMPORTED FROM	VALUE – (Thousands of Dollars)	Percentage of Total
UNITED STATES	202,799	97.0%
UNITED KINGDOM	5,442	2.6%
SWEDEN	481	.2%
GERMANY	257	.1%
OTHER COUNTRIES	164	.1%
TOTAL	$209,143	100%

Exports

Since the beginning of the century and even earlier, a large proportion of the agricultural machinery produced in Canada has been exported every year. The relationship between Canadian production and exports of farm machinery is shown graphically in Exhibit III for the period 1922 to 1954.

Before 1939, slightly less than 40% of the Canadian agricultural machinery production was exported. After 1939, exports increased to about 50% of total production. This proportion has been maintained with reasonable consistency although the percentage has fluctuated more widely in the last few years and has shown a slight upward trend.

While a small volume of export business to the United States was developed during the 'twenties and 'thirties, it was not until after World War II that Canadian manufacturers of farm machinery started to find their main export market in that country. This change in markets is shown in the following table covering the period 1900 to 1954.

AGRICULTURAL MACHINERY EXPORTS FROM CANADA

(Thousands of dollars)

Year	Total Exports	Exports to United States	Exports to United States as a Percentage of Total	Exports to Commonwealth	Exports to Commonwealth Countries as a Percentage of Total
1900	$ 1,694	$ 11	.7	$ 948	56.0
1905	2,343	29	1.2	1,249	53.3
1910	4,330	97	2.2	2,038	47.1
1915	2,850	239	8.4	1,650	57.9
1920	11,741	3,409	29.0	3,166	27.0
1925	11,503	1,507	13.1	3,292	28.6
1930	18,679	4,400	23.6	3,184	17.1
1935	3,730	764	20.5	1,959	52.5
1940	9,537	2,529	26.6	5,495	57.8
1945	20,196	8,994	44.7	6,405	31.7
1947	42,337	23,478	55.8	7,591	18.0
1948	73,760	50,575	68.5	10,447	14.2
1950	87,811	71,587	81.4	2,698	3.1
1952	105,408	85,188	80.8	3,998	3.8
1953	74,316	59,022	79.4	2,500	3.4
1954	76,771	55,323	72.1	2,330	3.0

Note: Export figures shown in this table prior to 1940 pertain to government fiscal years. Export figures shown for later periods and used elsewhere in this report are for calendar years.

The volume and proportion of exports to the United States increased rapidly after the close of World War II and currently account for 75% to 80% of all exports of agricultural machinery produced in Canada. Of the remainder about 10% is exported to South American countries, and about 3% to Commonwealth countries, the rest being spread among such countries as Panama, Morocco, etc.

There are three main reasons for the increase in exports to the United States and the decline in exports to other countries. In the first place, after World War II exchange restrictions in most overseas countries practically eliminated those markets. To retain the foreign business it had established Massey-Harris, for example, found it necessary to build plants in certain countries. Secondly, the extensive integration of the manufacturing opera-

tions of the companies with plants on both sides of the United States-Canadian border resulted in a substantial increase in both exports and imports. Finally, both Massey-Harris and Cockshutt intensified their sales efforts in the United States in the face of restrictions and uncertainties in other countries.

3

GENERAL DESCRIPTION OF CANADIAN AGRICULTURAL MACHINERY INDUSTRY

Makeup and Location of Agricultural Machinery Industry

The agricultural machinery industry in Canada has long been dominated by four companies, namely Massey-Harris-Ferguson Limited, International Harvester Company of Canada Ltd., John Deere Plow Company Ltd. and Cockshutt Farm Equipment Company Limited. Prior to World War II these companies accounted for over 80% of the Canadian industry's total output. In recent years their share of that total has risen to over 90%. This increase is attributed mainly to the greater complexity of the machinery now being produced and to the expansion of export sales. Generally speaking the smaller companies are restricted to serving a local market with implements of a relatively simple nature. Actually a great many companies, both large and small, but not regarded as agricultural machinery manufacturers, do make certain agricultural tools and machines on a limited basis. However, this production is not an important factor and is not relevant to the history or the future of the industry as such.

In 1953 Massey-Harris, much the largest company in Canada, combined with Ferguson Tractor to form Massey-Harris-Ferguson Limited. This company produces slightly more than 50% of all the farm machinery made in Canada. Next in size are International Harvester with about 25% of the Canadian production and Cockshutt with about 15%. The fourth, John Deere Plow, is the smallest of the group and has relatively small manufacturing facilities in Canada.

Of these four, Massey-Harris-Ferguson and Cockshutt are Canadian-controlled. The other two, International and John Deere, are subsidiaries of large United States firms.

The percentages set out above relate to domestic manufacturing only, and should not be taken to indicate a similar relationship in the share of the domestic market, some three-quarters of which is supplied by imports.

The Canadian industry is almost entirely located in Ontario and about 95% of the production comes from that province. Actually the concentration is even more pronounced as most of the production in Ontario takes place within 50 miles of Hamilton, Ontario.

Profits of Canadian Agricultural Machinery Companies

It would be practically impossible to provide an accurate statement of the relative profits made by the four main companies in their Canadian operations alone. Production is integrated between their Canadian and United States plants and different bases are used by the respective companies for determining the selling prices of the products moving between the two countries. It is equally difficult to separate profits made on domestic manufactures from profits made on similar goods when imported.

Executives of the companies concerned, while not expressing completely uniform opinions, agreed that their manufacturing profits in the two countries are in about the same proportion currently. They pointed out that marked variations in profit on either side of the border can occur depending upon the scale of operations, the products allocated for manufacture in the Canadian and United States plants respectively, the equipment available, and so on.

Exhibit IV shows a summary of the consolidated operating statements of the four companies with plants in both Canada and the United States for the years 1939, 1946, 1950, 1954 and 1955. The statements cover the total operations of these companies including those relating to non-agricultural machinery products. As might be expected, the profits and sales of the United States-controlled companies are much greater than are those of the Canadian-controlled companies. It will be seen that the profits for all companies decreased substantially in 1954 without a proportionate decrease in sales. This situation showed some improvement in 1955.

Size of Agricultural Machinery Industry Compared with Other Industries in Canada

Some concept of the size of the industry in relation to other industries, may be seen in Exhibit V.

Thirty-nine industries are listed in the order of number of employees as this appears to give the most understandable concept of comparative size. A similar comparison is made on the basis of "Value Added" in production.

It will be seen that there are 30 industries employing more people than does the agricultural machinery industry, which employed 14,101 in 1953 or

slightly over 1% of the Canadian industrial total of 1,327,451.

In the case of "Value Added" in production the industry accounts for approximately 1% of the total for all manufacturing industries. However, because of the wide fluctuations that have taken place in the industry over the years, both of these indices of comparative size should be considered as approximations.

Fluctuations in Agricultural Machinery Production

That the agricultural machinery industry tends to be more volatile than other industries may be seen from the following table in which index figures are used to compare the production of agricultural machinery with the production of all manufacturing industries in Canada and with the Gross National Product.

PRODUCTION OF AGRICULTURAL MACHINERY COMPARED WITH ALL MANUFACTURING AND WITH GROSS NATIONAL PRODUCT IN CANADA

	(a) INDEX		
YEAR	VALUE OF PRODUCTION OF AGRICULTURAL MACHINERY	VALUE OF PRODUCTION ALL MANUFACTURING INDUSTRIES	GROSS NATIONAL PRODUCT
1926	100	100	100
1930	70.3	105.8	104.8
1935	35.8	85.6	82.1
1940	47.8	146.1	129.8
1945	101.1	266.1	223.8
1950	370.2	445.6	340.6
1952	508.3	547.7	440.2
1953	417.7	573.6	461.8
1954	395.5	564.3	454.1

(a) *DOES NOT INCLUDE PRODUCTION OF WAR MATERIALS.*

As may be seen from this table the index of the agricultural machinery industry declined more seriously during the depression years than did the index for all manufacturing industries in Canada or the index for the Gross National Product. It has also fluctuated widely in the postwar years, the index of the industry actually exceeding that of the Gross National Product in 1950, then falling somewhat behind in 1953 and substantially so in 1954.

There are two main reasons for these very pronounced swings. The first is the sensitivity of the domestic demand to changes in farm income. The second is the abnormal set of conditions that developed after World War II.

(a) Dependence on farm income.

Sales of agricultural machinery follow the trend of farm income closely. Exhibit I, mentioned earlier in this report, shows how the sales of agricultural machinery in Canada and

net farm income paralleled each other during the period 1926 to 1940. During the war years sales of agricultural machinery were restricted while farm income rose sharply. After the war the index of agricultural machinery sales exceeded that of farm income but since 1948 the two indices have tended to again become reasonably comparable.

Historically, farm income has varied much more widely than has income generally in Canada and these variations in farm income are reflected almost immediately in the demand for agricultural machinery. For the most part farmers delay their purchases of new agricultural machinery until they can foresee the size and value of their crops. If conditions are unfavourable, farmers usually postpone their purchases of new equipment. Under more prosperous conditions they tend to buy ahead of actual needs.

(b) Abnormal conditions in the postwar years.

A number of factors contributed to the abnormal conditions that developed after World War II. The backlog of demand that built up during the war years; the man-power shortage that developed in the postwar years; the abnormal demand for grain and other foodstuffs from North America that pushed farm prices to abnormal heights—all these played their parts in placing unprecedented demands on the agricultural machinery industry. By 1953, with a reduced demand for farm products, farm income had started to drop appreciably and the backlog of unfilled demand for agricultural machinery had been largely met. As a result the production of agricultural machinery in Canada which reached its peak of $195 million in 1952 fell sharply to an amount of $113 million in 1954.

Similar influences may be expected to affect the industry greatly in the future. Of these, changes in farm income should continue to play the most important part.

4

COMPARISON OF AGRICULTURAL MACHINERY INDUSTRIES IN THE UNITED STATES AND CANADA

The extensive integration of the manufacturing operations of those companies with plants in both the United States and Canada has been referred to earlier in this report. Because of this integration of facilities and the large volume of both exports and imports that has developed between the two countries, comparisons between the agricultural machinery industries in the United States and Canada are of particular interest.

Comparative Volume of Production in the United States and Canada

The following table compares the production of the United States and Canadian agricultural machinery industries at five-year intervals from 1920 to 1950 and for the years 1951 to 1953.

PRODUCTION OF AGRICULTURAL MACHINERY, UNITED STATES AND CANADA
1920 to 1953 (MILLIONS OF DOLLARS)

YEAR	Canadian Production 400 800 1200 1600 2000 2400	CANADIAN PRODUCTION	Index	United States Production UNITED STATES PRODUCTION	Index	United States Production as Multiple of Canadian
1920		50	100	537	100	10.7
1925		25	50	392	73	15.7
1930		27	54	505	95	18.7
1935		14	28	334	62	23.8
1940		18	36	562	105	31.2
1945		39	78	758	141	19.4
1950		142	284	1,792	334	12.6
1951		162	324	2,204	410	13.6
1952		195	390	1,933	360	9.9
1953		160	320	1,648	307	10.3

It will be seen that in recent years the production in the United States has been some ten to 11 times that of the Canadian production.

These figures also show that the output of the Canadian industry has varied much more widely than its counterpart in the United States. For example, since the end of World War II the value of Canadian production has increased about four times, whereas the United States industry has only slightly more than doubled. On the other hand Canadian production dropped over 70% in the 'thirties while United States production dropped less than 40%.

Comparative Size of United States and Canadian Markets for Agricultural Machinery

The comparative size of the respective markets for agricultural machinery in the United States and Canada is shown in the following table for the years 1935 and 1939 and for each of the years 1945 to 1953.

AGRICULTURAL MACHINERY SALES, UNITED STATES AND CANADA

(THOUSANDS OF DOLLARS)

YEAR	APPARENT CONSUMPTION UNITED STATES	SALES IN CANADA	UNITED STATES CONSUMPTION AS A MULTIPLE OF CANADIAN
1935	264,482	12,370	21.4
1939	331,261	29,924	11.1
1945	623,035	82,433	7.6
1946	780,484	102,525	7.6
1947	1,167,732	145,671	8.0
1948	1,594,590	197,663	8.1
1949	1,633,927	245,194	6.7
1950	1,639,547	248,049	6.6
1951	2,014,107	264,393	7.6
1952	1,779,403	281,509	6.3
1953	1,625,854	269,869	6.0

NOTE: PRIOR TO 1943 CANADIAN SALES ARE BASED ON APPARENT CONSUMPTION, i.e. PRODUCTION, PLUS IMPORTS, LESS EXPORTS.

While it is customary in the case of many products to find that the United States market is at least ten times the size of the Canadian market, this relationship does not hold true in the case of agricultural machinery. As shown in the above table, the market for agricultural machinery in the United States has been only about seven times the size of the market in Canada since the end of World War II.

TOTAL VALUE OF AGRICULTURAL MACHINERY ON FARMS IN THE UNITED STATES AND CANADA
(Millions of Dollars)

UNITED STATES (1950)	$12,944
CANADA (1951)	1,933

SOURCE: *United States and Canadian Census Reports*

This relationship is also borne out by a comparison between the value of agricultural machinery in use on farms in Canada and in the United States.

Adjusting for the difference in the years in which these valuations were made the total value of agricultural machinery on farms in the United States is approximately seven times that on Canadian farms.

Over-all Market and Freight Rates

Under conditions of free trade between the United States and Canada, the location of both the United States and Canadian industries in relation to the over-all United States–Canadian market is significant because of the freight costs that are involved. Generally speaking the Moline-Davenport area in Iowa can be considered the geographic centre of the industry in the United States. In Canada the centre of the industry is Hamilton, Ontario.

Based on outward freight rates from these two centres the combined United States–Canadian market can be divided into two areas, one of which has more favourable freight rates from Moline-Davenport and the other more favourable freight rates from Hamilton, Ontario. A map dividing the over-all market into these two areas is shown in Exhibit VI and in the following table an estimate is made of the value of farm machinery now in use in each area. It is recognized that inward freight charges on raw materials as well as the location of individual plants would vary the boundaries to some extent but in general the division is sufficiently accurate.

DIVISION OF UNITED STATES AND CANADIAN MARKET FOR AGRICULTURAL MACHINERY BASED ON ESTIMATED FREIGHT RATES FROM UNITED STATES AND CANADIAN PLANTS
(Thousands of Dollars)

ESTIMATE OF AREA IN WHICH FREIGHT IS LOWER	VALUE OF FARM MACHINERY IN USE	PERCENTAGE
FROM UNITED STATES PLANTS	$11,004,000	74%
FROM CANADIAN PLANTS	3,873,000	26%

SOURCE: *Canadian Census Reports of 1951 and U.S. Census of 1950.*

This estimate indicates that the United States agricultural machinery industry has an advantage in outward freight costs in about 75% of the combined United States–Canadian market for agricultural machinery and the Canadian industry has a freight advantage in about 25% of this combined market.

The map shown as Exhibit VI indicates that all of Canada is included in the area in which outward freight costs are favourable to the Canadian industry. Actually western Canada is considerably closer to the centre of the United States industry at Davenport-Moline, Iowa, than it is to the centre of the Canadian industry around Hamilton, Ontario. In spite of this, the freight rates to most points in western Canada have been slightly lower from Hamilton, Ontario than from Davenport-Moline, Iowa since 1919.

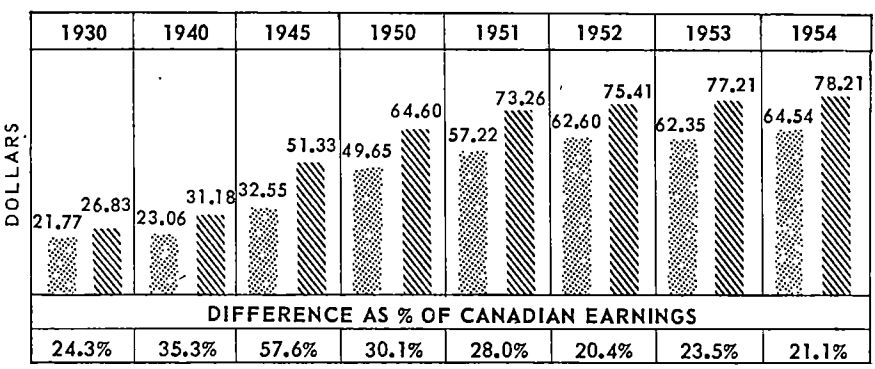
Comparative Labour Rates

Exhibit VII shows weekly earnings in the agricultural machinery industry compared with similar earnings for all manufacturing industries. This information is shown both for the United States and Canada for the years 1930 to 1954 inclusive.

In the case of both countries, it will be noted that wage levels in the agricultural machinery industry throughout the period were about 10% to 15% higher than the general level for all manufacturing industries. Part of this differential can be accounted for by the fact that the industry employs a high percentage of men. But apart from this it appears that wage rates in the industry have been relatively high.

When the wage rates of the Canadian agricultural machinery industry are compared with those of the same industry in the United States, the earnings in Canada are noticeably lower. This may be seen from the following table:

WEEKLY EARNINGS OF PRODUCTION WORKERS
IN THE CANADA AND UNITED STATES
AGRICULTURAL MACHINERY INDUSTRY



These figures show that although the difference in weekly earnings has been reduced in recent years, the Canadian industry still retains an advantage of some importance. "Fringe benefits" in both countries comprise about the same items, with the cost of each benefit usually being related directly to the wage rates. Consequently the total costs of "fringe benefits" in the two countries are in about the same ratio as the wage rates.

Productivity of Labour

Because it is the practice of the larger companies to concentrate their full production of any one product in a single plant, it is difficult to secure examples of comparative labour productivity in United States and Canadian plants.

It is the general opinion of the manufacturers that, as far as individual labour productivity is concerned, there would be little or no difference between the output of workers on either side of the border if identical conditions prevailed.

However, the rate of productivity in the industry as a whole is usually higher in the United States than it is in Canada. This is the result of the greater investment in specialized machinery per worker in the large plants in the United States which is warranted by their longer manufacturing runs.

With this development in the United States there has been an increase in total labour productivity in that country that offsets in part or in whole the lower wages paid in Canada. It is not possible to obtain fully documented instances of this, and there are no doubt exceptions in the case of specialized machines of limited use. For example, while figures were not available on the comparative manufacturing costs of self-propelled combines, the heavy export of these machines by Massey-Harris-Ferguson would suggest no important disadvantage in labour productivity.

On the other hand, International Harvester and Deere, whose main plants are in the United States, have tended to make their important long-run items in their more specialized United States plants. Their lower demand products requiring less specialized equipment are made in Canada.

Certainly as agricultural machinery becomes more complex, an expansion of mass-production techniques can be expected which will tend to offset the advantages of lower wage areas.

Raw Material Costs

Unlike most Canadian industries, the agricultural machinery industry in Canada pays no duty on iron, steel, parts or tools required for manufacturing. This means that imported materials cost the Canadian manufacturer the same as they do his United States counterpart, except for freight differentials

which may favour either manufacturer according to the location of his sources of supply.

Generally speaking, the Canadian agricultural machinery industry is under no disadvantage in its raw material costs.

Capital Expenditures

Information covering capital expenditures for new plant and equipment made by the industry both in the United States and Canada is available only for the five-year period 1949 to 1953. The comparative figures are shown in the following table:

CAPITAL EXPENDITURES FOR NEW PLANT AND EQUIPMENT BY AGRICULTURAL MACHINERY INDUSTRY IN UNITED STATES AND CANADA

(THOUSANDS OF DOLLARS)

YEAR	CAPITAL EXPENDITURES CANADA	CAPITAL EXPENDITURES UNITED STATES	UNITED STATES EXPENDITURE AS MULTIPLE OF CANADA
1949	4,237	51,692	12.2
1950	3,341	44,313	13.3
1951	4,266	57,695	13.6
1952	6,223	66,849	10.7
1953	4,166	78,382	18.5

It will be seen that over this five-year period the capital expenditures made by the United States agricultural machinery industry have averaged approximately 13 times the capital expenditures made by the Canadian industry. During this same five years the annual production of agricultural implements in the United States averaged approximately ten times that of the Canadian production. Thus capital expenditures in the United States industry have been greater than can be accounted for by the relative production of farm machinery in the two countries. The most likely explanation for this higher rate of capital expenditure in the United States is that it results from the more extensive introduction of specialized equipment in the large plants in that country.

Reasons for the Smaller Proportionate Size of Canadian Agricultural Machinery Industry

The fact that the Canadian agricultural machinery industry is only one-tenth the size of the same industry in the United States is not explained by the comparisons that have been made in the preceding paragraphs of this section of the report. The Canadian market being one-seventh the size of

the United States market for agricultural machinery and the Canadian plants having a freight advantage in approximately one-quarter of the over-all United States–Canadian market seem to be valid reasons for the Canadian industry being larger than it is. Furthermore the greater productivity in the large plants in the United States while an important factor in considering comparative costs of manufacturing in the two countries has been offset at least in part by the lower wages that have been paid in Canada.

Three factors that have been important in determining the relative size of the industry in the two countries are discussed below.

(1) Distribution Facilities.

In the development or extension of markets in the agricultural machinery industry an effective dealer organization is of great importance and building up such an organization is a difficult and costly operation. Not only is widespread sales coverage required but parts and service facilities are essential.

Most of the larger companies in the United States commenced exporting to Canada before the beginning of the century and all have built up strong Canadian dealer organizations over the years. Although Massey-Harris sold some agricultural machinery in the United States in the early years, it was not until the J. I. Case Plow Company was purchased in 1927 that any real attempt was made to build up a dealer organization in that country. Cockshutt had very limited sales in the United States until after World War II and even today its dealer coverage south of the Canadian border is quite small. The other two important companies in Canada being subsidiaries of large United States companies have been able to make use of the over-all distribution facilities of their parent companies. However their production in Canada accounts for only some 35% of the total Canadian production.

Thus in the combined market the industry in the United States has had extensive dealer coverage in both countries for many years. In comparison the Canadian-controlled companies comprising approximately 65% of the Canadian industry have still only limited representation throughout the United States.

(2) Tractor Production.

As stated previously, practically no tractors are produced by the Canadian industry. As tractors represent about 20% to 25% of all agricultural machinery sold in the North American market this means that the Canadian industry does not compete in this important segment of the market.

(3) Plant Location.

The history of the industry in both countries has been one of dominance by large "full line" companies with only a very limited share of the market being left for smaller, more specialized manufacturers. It was natural for the large companies to emerge in the United States and to concentrate their plants in that country where much the greatest market existed. With the elimination of tariffs between the two countries the location of the large plants in the United States was equally well suited to serve the over-all market for North America.

Among the many factors outlined previously in this report that have determined the relative size of the agricultural machinery industries in the United States and Canada the three discussed immediately above appear to have been of particular importance in more recent years.

5

OUTLOOK FOR THE FUTURE

The future of the agricultural machinery industry in Canada will be influenced by conditions in both overseas and North American markets.

Overseas Markets

Only about 10% of the agricultural machinery produced in Canada has been sold recently in overseas markets. Such exports go principally to South American and British Commonwealth countries. In these countries there is a growing demand for modern equipment, as their farm mechanization programmes are well behind the North American standard. However, for the last 20 years foreign exchange restrictions and quotas have limited the volume of sales of Canadian farm machinery to these countries, and encouraged the establishment of local industries. In many instances this has been done by foreign companies such as Massey-Harris-Ferguson.

There appears to be little possibility of foreign exchange restrictions being overcome in the foreseeable future and with many countries building up their own agricultural machinery industries, it is unlikely that sales to the "soft currency" countries will expand appreciably beyond their present level.

One factor could affect the volume of overseas sales appreciably. This would be a decision under a government financed scheme, such as the Colombo Plan, to provide economic aid in the form of agricultural machinery to certain countries that were backward in their agricultural programmes. The effect of such a decision would not likely be significant to the industry over a long period of time but might be of considerable importance for a short term.

North American Market

The factors affecting the demand for agricultural machinery in the United States and Canada are much the same and the probable future trend of the

market in both countries can be considered at the same time. In evidence of this, the value of sales of agricultural machinery in the United States has been consistently about seven times the value of sales in Canada throughout the past ten years. Sales of agricultural machinery will continue to be affected by a great number of different factors many of which are interrelated. Some of the more important influences are as follows:

(1) Farm Income and Long-Term Demand for Food Products.

As mentioned before, agricultural machinery sales parallel closely the changes in farm income levels. This relationship was disturbed during the war and immediate postwar years but in recent years the influence exerted by farm income on machinery sales is again quite apparent.

For the past three years both farm income and agricultural machinery sales have been falling. While this decline may continue for a period, there appears to be little question that the growth of population and the world-wide demand for food products will eventually bring about a return to higher farm income levels. This does not mean that a rise in farm income to the peak levels of the early postwar years would result in agricultural machinery sales also regaining the more than proportionate increase in volume achieved in that period. The relationship between the two at that time must be considered abnormal. It is more likely that any future increase in farm income will be accompanied by an approximately parallel rate of increase in sales of agricultural machinery.

(2) Technological Development.

Innovations and improvements in agricultural machinery have been one of the main reasons for the industry's expansion during the past 75 years or more. Each advance was designed to eliminate manual labour on the farm or at least to extend its productive capacity. The development of the binder, the tractor and the combine were revolutionary in their effects and moved so far in the direction of mechanizing farm activities that it appears unlikely that a comparable effect will be achieved by further inventions. This is not to suggest that new labour-saving machinery will not be introduced.

The industry has been intensifying its efforts to develop new products and to improve the performance of existing machines. The increased attention being given to research and engineering will undoubtedly result in products of better design and quality as well as the development of new machines that will make possible further steps in farm mechanization.

In the case of the manufacturing processes used by the industry, much technological progress has been made in recent years. However, the industry has not been able to make as wide use of special purpose machines, assembly line operations, etc. as have many other industries. This is because a wide variety of products must be manufactured and many items must be made on the basis of short production runs. For the same reason, it is unlikely that automation will be applied as widely in the agricultural machinery industry as, for example, in the automotive industry, where more standardized items are manufactured, each in far greater numbers than any farm machine.

There is no doubt that technological developments will continue to have an influence on the future growth of the market. Whether the advances come in the agricultural machinery products themselves or in the methods of manufacturing them, there will always be a large market for any item that will assist in lowering farming costs.

(3) Farm Population, Farm Size and Degree of Mechanization.

These three interrelated factors have in the past and will in the future have an important bearing on the size of the market for agricultural machinery.

Both in Canada and in the United States there has been a continuing and quite drastic decline in farm population. In Canada the farm population was 3,152,000 in 1941 or 27.4% of the population. By 1951 it had dropped to 2,911,000 or 20.8% of the population. During the same period the total acreage under cultivation increased by about 5% while the number of farms decreased from 733,000 in 1941 to 623,000 in 1951.

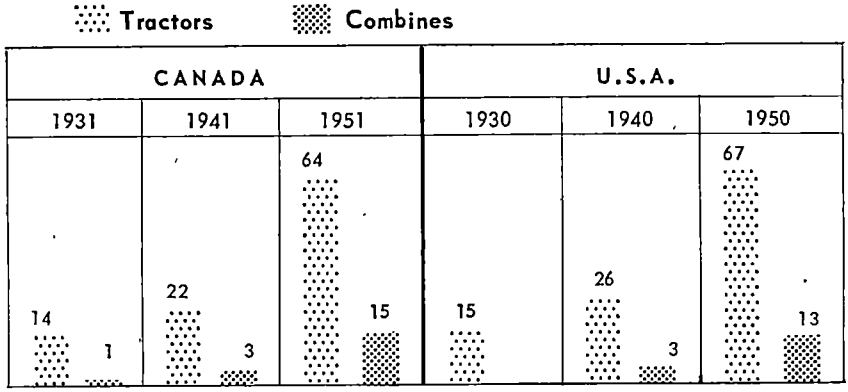
The reduction in farm population was made possible by the increased productivity of farm labour through the use of agricultural machinery. This in turn has led to larger farms in order that the machinery may be utilized to the fullest possible extent and its cost justified in terms of lower costs per unit of output.

While the trend to larger farms and more mechanization is bound to continue, it is difficult to forecast whether it will proceed at a faster or slower rate than in the past. There are many opposing factors that will have a bearing on the matter. During the first five years after the war the incentives for reducing costs were less pressing; marketing of grain was no problem; prices were reasonably high and costs, while rising, had not reached their postwar peak. The last few years however, have seen a much closer balance between costs and farm prices resulting in

a greater incentive for the farmers to obtain further economies in production costs. This condition should help to maintain the trend towards larger farms and increased mechanization. On the other hand substantial progress has been made already along these lines and the scope for further progress has been partly reduced.

The following table shows the increase in the number of tractors and combines per 100 farms in Canada and in the United States over a period of 20 years.

NUMBER FARM MACHINES PER 100 FARMS



Source: *United States and Canadian Census Reports*

The record of increased mechanization shown in this table is impressive. On the other hand while estimates are not available as to the probable saturation point of farm equipment it does not appear that this point has been reached.

In summary, it seems probable that the trend to larger farms and increased mechanization will continue in the future at a somewhat reduced rate.

(4) Size of Replacement Market.

During the war years supplies of new machinery were limited and replacements of machinery were affected until the postwar period. This resulted in the normal replacement market being disturbed. Much of the machinery purchased in the 1946 to 1952 peak sales period will not need to be replaced for some time. This was probably a contributing factor to the decline in the sales of agricultural machinery in 1953, 1954 and 1955. Within a few years this abnormal situation should correct itself and a more normal volume of machinery sales for replacement purposes should develop. The extent and timing of this adjustment will be affected by farm income levels.

5) Estimates of Future Demand.

Only one of the four large agricultural machinery companies in Canada has made a long-range projection of the probable future demand for agricultural machinery in the combined Canadian–United States market.

However, the general opinion of the large Canadian manufacturers seems to be that while the rather serious decline in sales occurring in 1953, 1954 and 1955 resulted largely from falling farm income, the industry could not expect to maintain the rate of expansion established in the earlier postwar years. Subject to continued fluctuation because of changes from year to year in farm income, the industry seems to expect that the demand for agricultural machinery will have a growth pattern over the longer term that parallels roughly the general development of the economy of both countries.

In Exhibit VIII, a comparison is made between Canadian agricultural machinery sales and the Gross National Product of Canada for the period 1926 to 1954. As may be seen from this exhibit, the index shown for agricultural machinery sales in 1954 (based on 1949=100) returned to a reasonably close relationship with that of the Gross National Product for that year and it seems likely that this relationship will be even closer for 1955.

At the same time, it is difficult to visualize the demand for agricultural machinery either in Canada or in the United States keeping pace with the expected growth of the Gross National Product in these countries over the long term. As mentioned previously, many of the factors that contributed to the growth of the industry in the past are not likely to have the same effect in the future and there appears to be little question that replacement rather than original sales will form a much greater proportion of the demand for some time to come. In addition most of the arable land in the United States and Canada is already under cultivation and there does not appear to be the same opportunity for agriculture to expand as exists for other sections of the economy.

The extent to which the demand for farm machinery may fall behind the growth of Gross National Product over the long term cannot be gauged with any accuracy. However, the disparity could be fairly substantial in spite of the fact that the industry may be expected to increase its actual sales volume over the same period.

Participation of Canadian Agricultural Machinery Industry in Future Markets

Exhibit IX shows the relationship between the production of agricultural machinery in Canada and the total sales of farm machinery in the United States and Canada combined.

It will be noted that prior to World War II Canadian production amounted to less than 5% of the combined United States–Canadian market for agricultural machinery but that in the postwar period the percentage has increased steadily and averaged slightly over 8%.

This gain can be attributed largely to the production of the self-propelled combine rather than to any general trend. As noted earlier this machine was introduced shortly after the war by Massey-Harris. Some 10,000 to 12,000 of these combines were produced annually from 1948 to 1953, thus adding $40 million to $50 million a year to the value of Canadian production. Latterly, similar United States machines have entered the market, but the Canadian machine continues to be competitive.

Nevertheless, it appears that the Canadian industry may have difficulty in retaining its present share of the combined North American production in any future expansion on this continent. In considering plans for expanding existing facilities or erecting new plants, all companies will be influenced greatly by the need for locating them so that the available market can be served most effectively. The industry in the United States is well located to serve the whole North American market.

Although it is not considered likely that the United States will re-impose a tariff on agricultural machinery imports, this possibility cannot be wholly ignored by a company contemplating a new plant location or an important extension to one of its existing plants. This is especially important when one considers what was pointed out earlier, that the market in Canada is only about one-seventh that of the combined United States–Canadian market.

The tendency for the manufacturers of agricultural machinery to concentrate production in larger or more specialized plants so that full advantage can be taken of technological advances and the economies of large-scale production is also a factor. With most of the larger plants already located in the United States it appears likely that this will influence the continued expansion of the industry in that country.

Offsetting to some degree these various factors that favour the expansion of the agricultural machinery industry in the United States rather than in Canada are two advantages associated with Canadian operations. The first of these is the fact that labour rates are lower in Canada. As pointed out earlier earnings of labour in the Canadian industry are currently about 20% lower than those in the United States industry. While this is a definite advan-

tage at the present time there has been a trend towards a narrowing of the differential. For that reason a company, viewing the matter from a long term point of view, might tend to discount this advantage.

The second advantage is the Canadian agricultural machinery industry's preferred position in serving export markets. Both the location of the Canadian industry and its preferred tariff position in Commonwealth countries favours its position over that of the United States industry. In view of exchange restrictions this advantage is of doubtful value in the foreseeable future.

It is doubtful that these two factors would be considered of sufficient importance to outweigh the various advantages that favour the expansion of the industry in the United States over a long term. At the same time, it is not expected that the Canadian industry will decline in size, as all companies, now operating plants in Canada, will probably endeavour to make full use of their Canadian production facilities. Expenditures will probably be made from time to time to adapt the Canadian plants to the production of new lines, or to modernize production methods even though any broad expansion in Canadian production facilities appears unlikely.

6

SUMMARY AND CONCLUSIONS

Summary

1. The agricultural machinery industry is not one of the larger industries in Canada. It represents less than 1% of the value of manufacturing in the country and about the same proportion of the total labour force employed by Canadian industry as a whole.

About 95% of the industry's production is accounted for by four companies. The largest manufacturer is Massey-Harris-Ferguson Limited which provides just over half of the total agricultural machinery production in Canada. Next in size is International Harvester Company of Canada Limited with about 25% to 30%, followed by Cockshutt Farm Equipment Limited which accounts for about 15%. The fourth concern, John Deere Plow Company Limited, is much the smallest of the group and has only limited manufacturing facilities in Canada.

Of these four, Massey-Harris-Ferguson and Cockshutt are Canadian controlled while International Harvester and Deere are subsidiaries of large United States concerns.

The profits made by these companies as a result of manufacturing in Canada are difficult to segregate from the profits made from distributing both Canadian made and imported farm machinery in this country. However executives of the companies state that, generally speaking, the return from manufacturing in Canada is approximately similar to that obtained from a proportionate investment in a United States plant.

2. The peculiar position of the Canadian agricultural machinery industry in its relationship with the United States industry should be noted:

(a) There has been complete freedom of trade in agricultural machinery between the United States and Canada since 1944. Furthermore, Canadian manufacturers can import free of duty

any materials or tools required for the production of agricultural machinery.

(b) All four of the main companies with plants in Canada have manufacturing facilities in the United States as well.

(c) The products sold throughout North America by the four companies that operate plants on both sides of the border are manufactured in Canada or in the United States but not in both places. The interchange of products is an important factor in the trade of agricultural machinery between the two countries.

3. Certain special features in the development of the agricultural machinery industry in Canada should also be noted.

(a) While the industry now operates without tariff protection against imports, tariffs have been important during most of its history.

Both Massey-Harris-Ferguson and Cockshutt developed and became of important size during the period when there was a substantial tariff against imports of agricultural machinery. Likewise International Harvester and Deere commenced their manufacturing operations in Canada during this period of protection primarily to avoid tariffs.

(b) The United States tariff on agricultural machinery was not removed until 1913, and by then Canadian manufacturers had built up important overseas markets. Although some exports were made to the United States during the twenties and thirties, exports continued to go mainly to South American and European markets until the time of World War II.

(c) After the war exchange restrictions curtailed overseas sales substantially and the industry turned its attention to the market afforded by the United States. Its success in breaking into the market was influenced greatly by the following conditions: Massey-Harris already had manufacturing facilities and some distributing organization in the United States; the operations of the two United States subsidiaries could be integrated readily with those of their parents; Massey-Harris introduced the highly successful self-propelled combine to the market; there was a very great unfilled demand for agricultural machinery.

4. A review of the main factors affecting the competitive position and comparative size of the agricultural machinery industry in Canada and the United States may be summarized as follows:

(a) The production of the Canadian industry is approximately one-tenth that of the industry in the United States.

(b) The market for agricultural machinery in Canada is approximately one-seventh the size of the market in the United States.

(c) The costs of raw materials and manufacturing equipment are approximately the same in both countries.

(d) Wages are about 20% lower in the Canadian industry than in the United States industry but the spread appears to be narrowing.

(e) Longer runs and more specialized equipment in the United States industry offset the lower wages in whole or in part.

(f) The United States manufacturers have a freight rate advantage in about 75% of the combined United States—Canadian market. The Canadian manufacturers have some freight advantage in overseas markets.

(g) With the increasingly complicated nature of the agricultural machinery goes an advantage to the large production units. Most of these are in the United States.

(h) The comparatively smaller size of the Canadian industry has been influenced importantly by the more extensive coverage of the United States industry in the combined market; the absence of significant tractor production in Canada; and the preferred location of the United States industry to serve the combined market.

Conclusions

1. The agricultural machinery industry in Canada has been able to operate and expand in competition with the United States industry since 1944 without tariff protection. However a number of factors peculiar to the industry have played an important part in making this possible. The absence of a tariff on exports from Canada to the United States which allowed the Canadian manufacturer with plants in both countries to integrate their production activities was of great importance. In addition, the development of the Canadian industry under tariff protection; the abnormal demand for agricultural machinery that existed throughout North America in the early postwar years; the background of experience of the Canadian manufacturers in the United States market; as well as other unusual factors have been of such importance that the success of the industry in meeting free competition may well be looked upon as a special case.

2. There is excess productive capacity in the industry both in Canada and in the United States. However, the demand should be sufficient to permit the industry in Canada to maintain its production on a reasonably active basis in the immediate future. From a longer term viewpoint, it is not anticipated that the demand for agricultural machinery will increase at the same

rate of growth as is forecast for the economy of the United States and Canada generally.

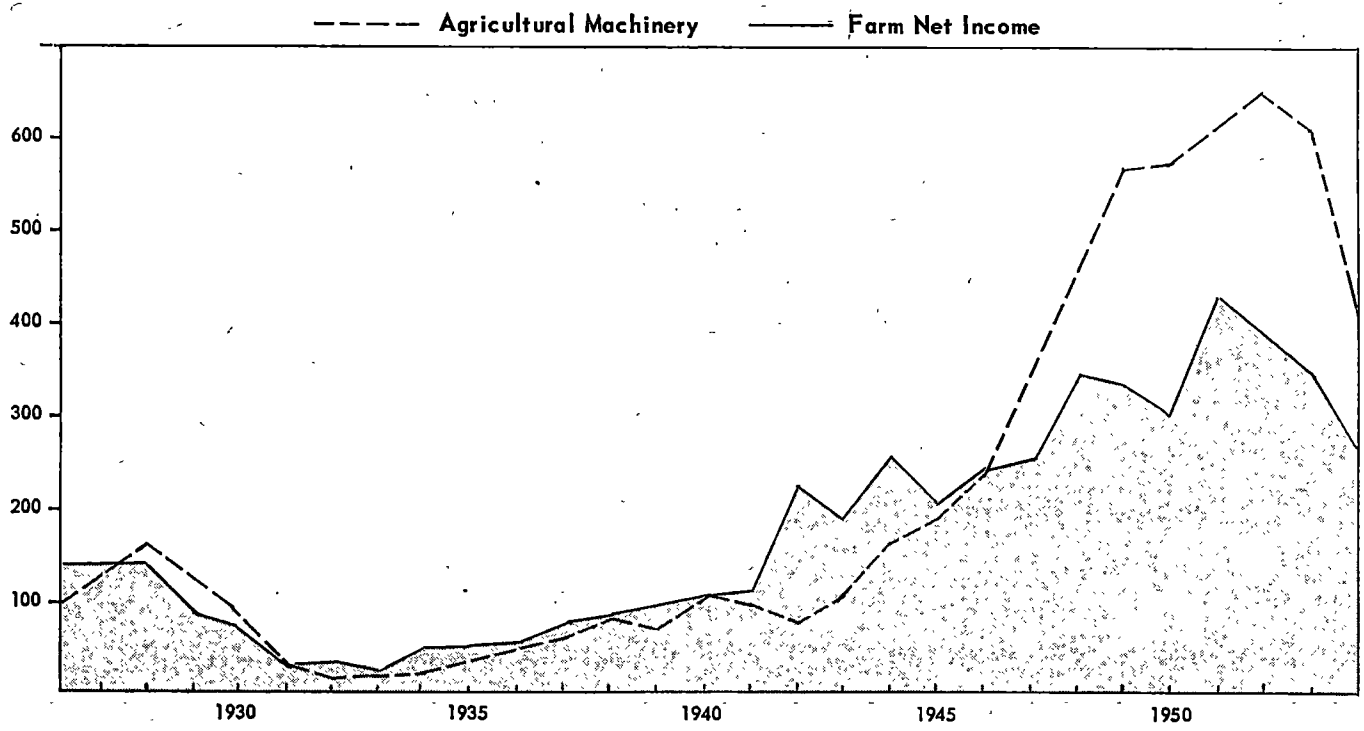
3. When the demand for agricultural machinery improves, the policies of the four main companies in meeting additional facility requirements may be quite different. Harvester and Deere are unlikely to consider any substantial increase in their Canadian manufacturing operations. With their large manufacturing plants in the United States being situated closer to the centre of the combined Canadian and United States market these companies have not introduced any major lines into their Canadian manufacturing operation in the past. There is no evidence that any factor favouring manufacturing operations in Canada is likely to become of sufficient importance to change this policy. Massey-Harris-Ferguson with its substantial manufacturing operations both in Canada and in the United States will be in a position to choose the location of any expansion on the strength of the conditions affecting costs and markets at that time. Cockshutt with its relatively small manufacturing operations both in Canada and in the United States will be influenced greatly by the location of the markets it must develop to compete with the larger companies.

4. In summary we do not believe that any large future expansion of the industry should be anticipated in Canada. The advantages to be gained through the use of large specialized plants, combined with the advantage in the geographical location of these plants in the United States to serve approximately 75% of the combined Canadian–United States market appears to more than offset any factors favouring extensive expansion in Canada.

EXHIBIT I

INDEX OF AGRICULTURAL MACHINERY SALES IN CANADA COMPARED TO INDEX OF FARM NET INCOME 1926 to 1953

1940 = 100



NOTE: SALES FIGURES 1926–1942 BASED ON APPARENT CONSUMPTION

EXHIBIT II

CANADIAN TARIFF ON AGRICULTURAL MACHINERY 1847 – 1944

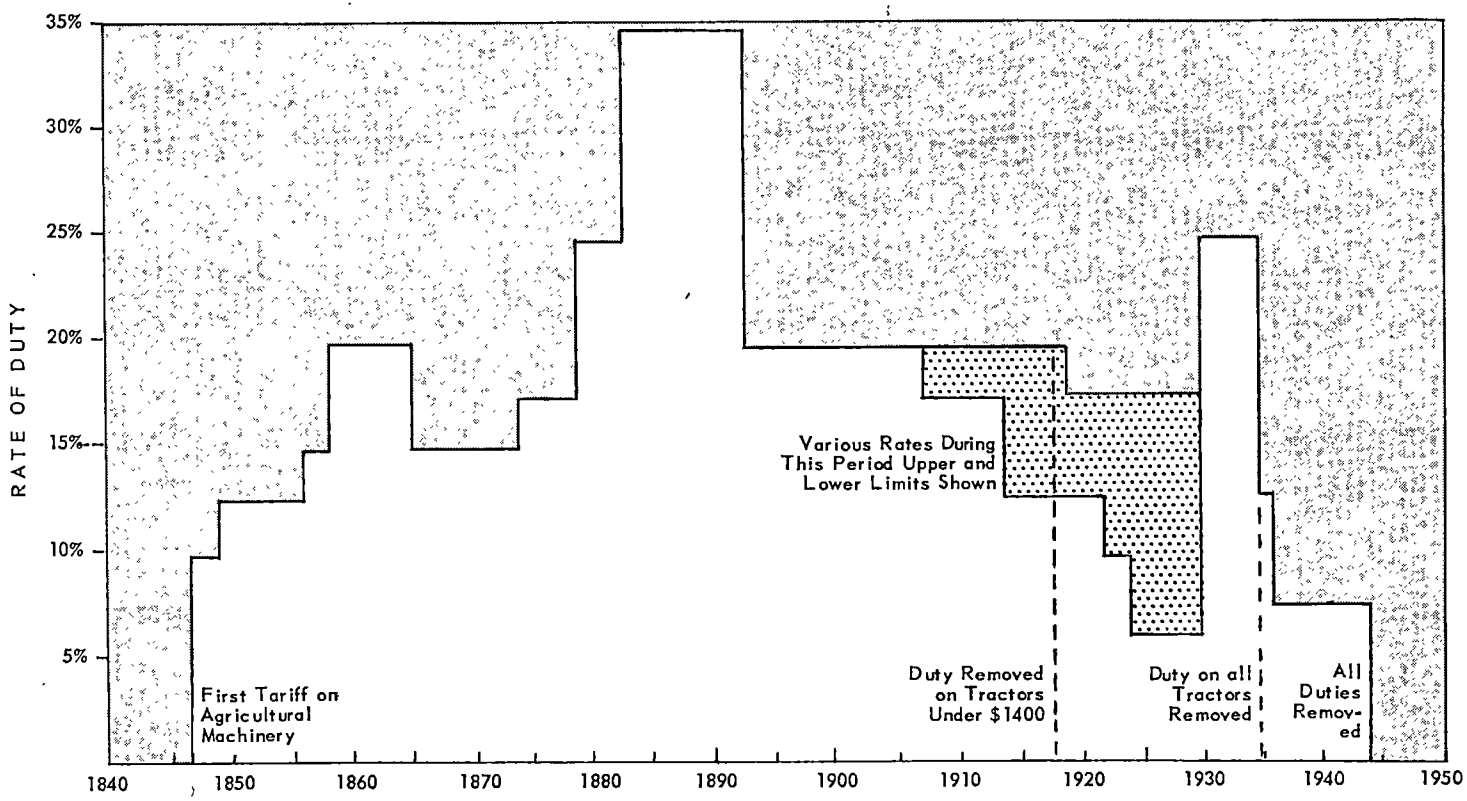


EXHIBIT III

PERCENTAGE OF CANADIAN PRODUCTION OF AGRICULTURAL MACHINERY EXPORTED
1925 – 1954

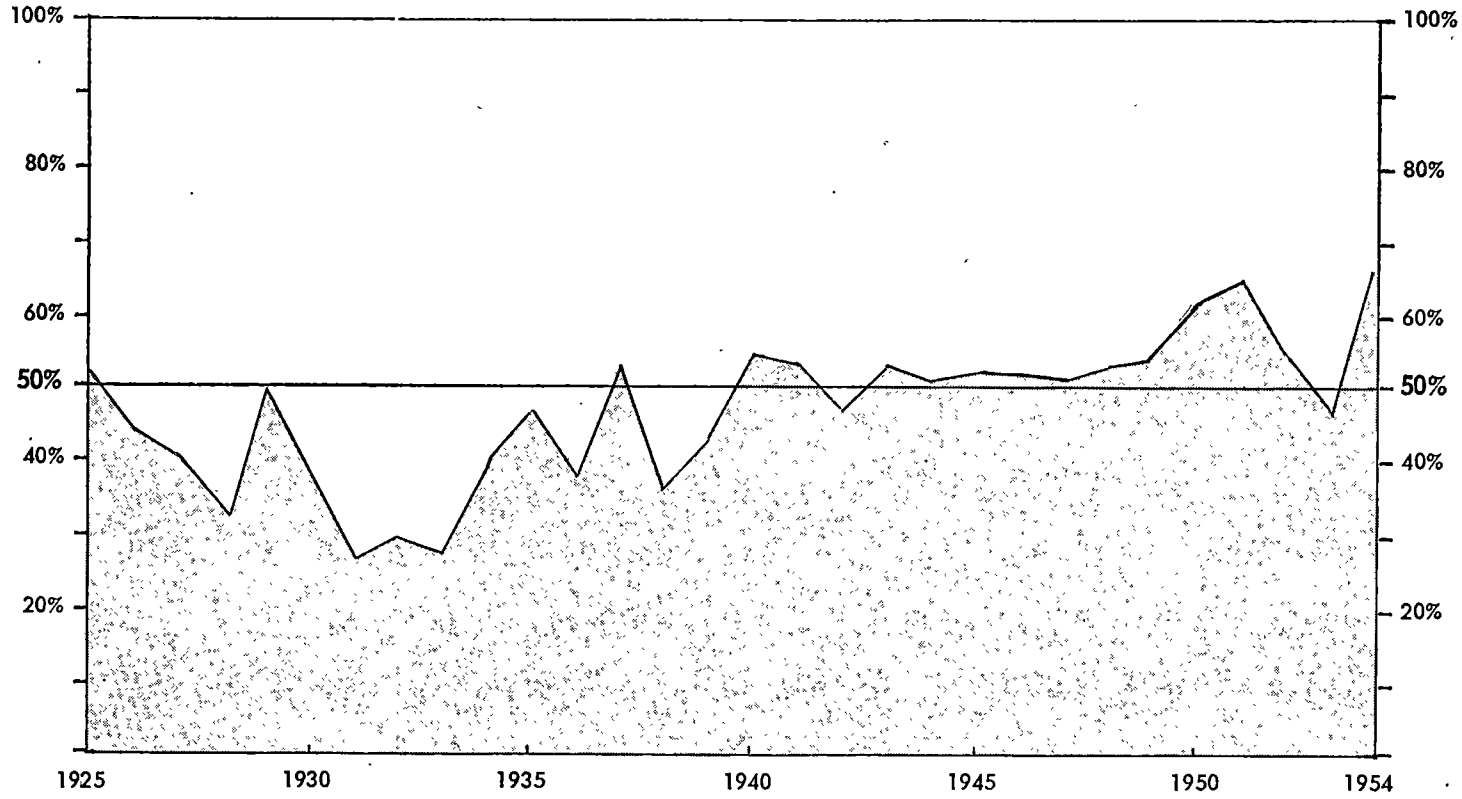


EXHIBIT IV

SUMMARY OF CAPITAL INVESTMENT AND EARNINGS OF PRINCIPAL AGRICULTURAL MACHINERY COMPANIES THAT OPERATE PLANTS IN CANADA AND IN THE UNITED STATES

(Thousands of dollars)

Company	Year	Sales	Capital and Surplus	Funded Debt	Profit Before Taxes	Net Profit After Taxes
INTERNATIONAL HARVESTER COMPANY—	1939	$ —	$331,342	$ —	$ 9,536	$ 7,953
United States and Foreign operations.	1946	—	491,151	—	28,838	22,326
	1950	942,601	614,551	—	115,215	66,715
	1954	994,074	715,504	100,000	62,354	36,304
	1955	1,165,785	743,955	100,000	102,251	55,501
DEERE & COMPANY INC.—	1939	$ —	$ 84,398	$ —	$ 9,753	$ 7,627
United States and Foreign operations.	1946	—	129,368	19,500	18,029	9,566
	1950	307,749	193,397	19,500	76,757	42,757
	1954	295,586	306,444	67,100	41,120	20,620
	1955	339,576	319,220	66,114	57,036	28,336
MASSEY-HARRIS-FERGUSON COMPANY LIMITED—	1939	$ —	$ 18,144	$ 11,000	$ 885	$ 705
Canadian, United States and United Kingdom	1946	—	23,052	15,000	4,376	2,126
operations.	1950	164,128	50,740	33,500	33,816	17,541
	1954	297,732	86,956	47,220	15,594	7,194
	1955	285,744	111,933	44,936	13,396	7,521
COCKSHUTT FARM EQUIPMENT LIMITED—	1939	$ —	$ 7,886	$ —	$ 70	$ 57
Canadian and United States operations.	1946	—	8,637	—	503	362
	1950	40,000	17,666	4,625	5,510	2,033
	1954	30,666	23,226	10,437	(3,102)	(1,920)
	1955	32,230	23,102	9,879	(320)	(599)

Notes: (1) Amounts include sales and earnings for non-agricultural products which are substantial in the case of International Harvester and of lesser importance for other companies.

(2) Massey-Harris and Ferguson Companies were amalgamated in 1953. The amounts shown for 1954 and 1955 are the results of the combined operation.

(3) Figures shown in parentheses denote losses.

EXHIBIT V

COMPARISON OF LARGER INDUSTRIES IN CANADA—1953

	Rank	Number of Employees	Rank	Value Added ($000's)
Sawmills	1.	60,933	4.	$269,066
Pulp and paper	2.	58,194	1.	599,936
Aircraft and parts	3.	38,048	5.	260,548
Railway rolling stock	4.	35,447	11.	153,678
Clothing, men's factory	5.	35,119	18.	125,834
Primary iron and steel	6.	34,956	6.	216,958
Bread and other bakery products	7.	33,540	17.	139,987
Motor vehicles	8.	32,973	3.	273,599
Furniture	9.	29,768	19.	121,483
Printing and publishing	10.	28,499	7.	174,943
Clothing, women's factory	11.	28,277	23.	103,679
Machinery, heavy, electrical	12.	25,454	10.	154,595
Non-ferrous smelting and refining	13.	25,115	2.	310,207
Printing and bookbinding	14.	23,846	21.	112,606
Motor vehicle parts	15.	23,335	16.	141,252
Cotton yarn and cloth	16.	23,178	36.	73,326
Slaughtering and meat packing	17.	22,887	12.	152,023
Electrical apparatus and supplies	18.	22,671	15.	141,809
Rubber goods, including footwear	19.	22,600	8.	172,673
Shipbuilding	20.	22,571	20.	115,523
Machinery, industrial	21.	22,163	14.	145,229
Footwear, leather	22.	21,497	37.	65,467
Butter and cheese	23.	20,697	24.	95,787
Sash, door and planing mills	24.	20,241	35.	77,217
Sheet metal products	25.	18,275	22.	103,827
Radios and television sets	26.	17,213	26.	86,791
Synthetic textiles and silk	27.	15,723	34.	78,585
Fruit and vegetable preparations	28.	15,385	29.	82,492
Castings, iron	29.	15,346	27.	85,034
Hardware, tools and cutlery	30.	14,422	28.	84,773
Agricultural machinery	**31.**	**14,161**	**33.**	**79,100**
Boxes and bags, paper	32.	14,042	30.	81,755
Miscellaneous chemicals	33.	12,527	32.	80,180
Petroleum products	34.	11,858	9.	159,603
Structural steel	35.	11,243	25.	90,786
Miscellaneous food preparations	36.	9,757	31.	80,864
Breweries	37.	8,383	13.	146,806
Feeds	38.	7,233	39.	34,914
Flour mills	39.	4,962	38.	40,263

Note: Value added represents value of factory shipments less cost of materials, fuel and electricity.

EXHIBIT VI

APPROXIMATE DIVISION OF CANADIAN AND THE UNITED STATES MARKET FOR AGRICULTURAL MACHINERY BASED ON FREIGHT RATES FROM INDUSTRY CENTRES IN CANADA AND THE UNITED STATES.

Freight favourable to CANADIAN Industry

Freight favourable to UNITED STATES Industry

EXHIBIT VII

PER CAPITA WEEKLY EARNINGS, PRODUCTION WORKERS AGRICULTURAL MACHINERY INDUSTRY AND ALL MANUFACTURING

	In Canada		In U.S.A.	
Year	All Mfg.	Agricultural Implements	All Mfg.	Agricultural Implements
1930	$19.13	$21.77	$23.25	$26.83
1931	18.27	16.73	20.87	21.34
1932	16.23	16.52	17.05	17.96
1933	14.94	15.50	16.73	18.93
1934	15.91	16.52	18.40	23.42
1935	16.73	18.50	20.13	26.42
1936	17.23	19.15	21.78	26.78
1937	18.56	20.21	24.05	31.08
1938	18.38	20.92	22.30	28.08
1939	18.75	19.77	23.86	30.53
1940	20.85	23.06	25.20	31.18
1941	23.46	25.60	29.58	36.09
1942	26.60	29.15	36.65	37.94
1943	29.33	33.04	43.14	48.36
1944	30.08	33.88	46.08	51.71
1945	30.74	32.55	44.39	51.33
1946	29.87	33.03	43.82	47.41
1947	34.13	38.87	49.97	55.76
1948	38.53	45.29	54.14	60.59
1949	41.71	47.40	54.92	61.11
1950	43.82	49.65	59.33	64.60
1951	48.82	57.22	64.71	73.26
1952	53.62	62.60	67.97	75.41
1953	56.09	62.35	71.69	77.21
1954	57.16	64.54	71.86	78.21

Sources: Dominion Bureau of Statistics
United States Department of Labor

EXHIBIT VIII

COMPARISON OF SALES OF AGRICULTURAL MACHINERY IN CANADA WITH GROSS NATIONAL PRODUCT OF CANADA

(Thousands of dollars)

Year	Agricultural Machinery Sales	Index	Gross National Product	Index
1926	$ 38,897	89.2	$ 5,294,000	77.0
1930	38,410	88.0	5,546,000	80.7
1935	12,370	28.4	4,345,000	63.2
1940	43,617	100.0	6,872,000	100.0
1945	82,433	189.0	11,850,000	172.4
1950	248,049	568.7	18,029,000	262.4
1953	269,969	618.7	24,449,000	355.8
1954	174,039	399.0	24,041,000	349.9

Note: Sales for 1926 to 1940 based on apparent consumption, i.e., production plus imports, less exports.

EXHIBIT IX

COMPARISON OF CANADIAN PRODUCTION OF AGRICULTURAL MACHINERY TO COMBINED SIZE OF THE UNITED STATES-CANADIAN MARKET

(Thousands of dollars)

Year	Combined United States-Canadian Sales of Agricultural Machinery	Production of Agricultural Machinery in Canada	Percentage of Canadian Production to Sales
1935	$ 276,852	$ 13,692	4.9%
1939	361,185	16,035	4.4
1945	705,468	38,701	5.5
1946	883,009	53,990	6.1
1947	1,313,403	83,930	6.4
1948	1,792,253	139,079	7.7
1949	1,897,121	169,617	9.0
1950	1,887,596	141,674	7.5
1951	2,278,500	162,349	7.2
1952	2,060,912	194,688	9.4
1953	1,895,723	159,851	8.4

Note: As approximately 10% of Canadian production is sold outside the United States-Canadian market, the percentage figures shown in the table overstate the Canadian share of the total United States-Canadian sales of farm machinery.

EXHIBIT X

SOURCE OF STATISTICAL MATERIAL

All statistical material used in this report was obtained from the Dominion Bureau of Statistics except as hereunder noted.

Page Reference	*Data*	*Source*
7	United States tariff	United States Congressional Record
12	Canadian tariff	Department of National Revenue
24	Production of agricultural machinery in United States	United States Department of Commerce
28	Weekly earnings	Canadian Department of Labour
30	Capital expenditures by agricultural industry in United States	United States Department of Commerce
Exhibit IV	Companies' sales and earnings	Companies' published financial statements
Exhibit VI	Freight rates	Railway freight tariffs

Appendix A

OTHER STUDIES TO BE PUBLISHED BY THE ROYAL COMMISSION

Output, Labour and Capital in the Canadian Economy—
by Wm. C. Hood and Anthony Scott

Canadian Energy Prospects—
by John Davis

Progress and Prospects of Canadian Agriculture—
by W. M. Drummond and W. Mackenzie

The Commercial Fisheries of Canada—
by The Fisheries Research Board and The Economic Service of The Department of Fisheries of Canada

The Outlook for the Canadian Forest Industries—
by John Davis, A. L. Best, P. E. Lachance, S. L. Pringle, J. M. Smith, D. A. Wilson

Mining and Mineral Processing in Canada—
by John Davis

Canadian Secondary Manufacturing Industry—
by D. H. Fullerton and H. A. Hampson

The Canadian Primary Iron and Steel Industry—
by The Bank of Nova Scotia

The Canadian Automotive Industry—
by The Sun Life Assurance Company of Canada

The Canadian Industrial Machinery Industry—
by Urwick, Currie Limited

The Canadian Electrical Manufacturing Industry—
by Clarence L. Barber

The Electronics Industry in Canada—
by Canadian Business Service Limited

The Canadian Primary Textiles Industry—
by National Industrial Conference Board (Canadian Office)

The Canadian Construction Industry—
by The Royal Bank of Canada

The Canadian Chemical Industry—
by John Davis

The Service Industries—
by The Bank of Montreal

Probable Effects of Increasing Mechanization in Industry—
by The Canadian Congress of Labour, now
The Canadian Labour Congress

Labour Mobility—
by The Trades and Labour Congress of Canada, now
The Canadian Labour Congress

Skilled and Professional Manpower in Canada, 1945-1965—
by The Economics and Research Branch, Department
of Labour of Canada

Transportation in Canada—
by J.-C. Lessard

Industrial Concentration—
by The Canadian Bank of Commerce

Housing and Social Capital—
by Yves Dube, J. E. Howes and D. L. McQueen

Financing of Economic Activity in Canada—
by Wm. C. Hood with the collaboration of
J. V. Poapst and L. M. Read

Certain Aspects of Taxation Relating to Investment in
Canada by Non-Residents
by J. Grant Glassco of Clarkson, Gordon & Co.,
Chartered Accountants

Consumption Expenditures in Canada—
by David W. Slater

Canada's Imports—
by David W. Slater

The Future of Canada's Export Trade[1]—
by R. V. Anderson

Canada—United States Economic Relations[1]—
by Irving Brecher and S. S. Reisman

Canadian Commercial Policy[1]—
by J. H. Young

Some Regional Aspects of Canada's Economic Development—
by R. D. Howland

The Nova Scotia Coal Industry—
by Urwick, Currie Limited

Canadian Economic Growth and Development from 1939 to 1955—
by J. M. Smith

[1]This is one of a series of three studies on Canadian international economic relations prepared under the direction of S. S. Reisman.

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