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AGRICULTURE IN WESTERN CANADA; WHAT? WHERE? AND WHY?[1]

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The discussion is organized under the following major topics:

1. Market demand and supply relations (international, regional, and local)
2. Western Canadian commodity production
3. Soil type and climate
4. Technology, and
5. Economic rent and distance to markets
6. Farm production and agribusiness linkages in Manitoba

1. Market Demand and Supply Relations

The domestic market demand for Canadian grain has been relatively stable while major fluctuations have occurred in the export market demand and total production (Figure 1).

Wheat is the major western Canadian crop. A few major purchasers account for 65% of Canadian wheat exports (U.S.S.R., China, and Brazil; see The Canadian Wheat Board, Annual Report, 1984-85). The Canadian Wheat Board sales are priced at west coast ports or Thunder Bay and farmers receive a "pooled price less shipping costs". The price in the export market less transport charges determines the price the Canadian Wheat Board receives for wheat exports. The price Russians and other importers are willing to pay for Canadian wheat depends on the level of their own production and the available supply in the International wheat market.

The production of wheat by Canadian farmers is determined by the expected wheat price level, climate factors and other cropping opportunities. Long term studies indicate that Canada has a competitive advantage in grain production. Current agricultural policies in the European Community and the United States have resulted in very large subsidies to their producers and subsidized export sales. As a result of these subsidies a very large surplus of grain now exists on an International basis and prices received by Canadian farmers are almost one half of the 1982 peak of $220 per tonne (Figure 2). The Canadian government through subsidies has significantly supported the income level of Canadian grain producers. As a result

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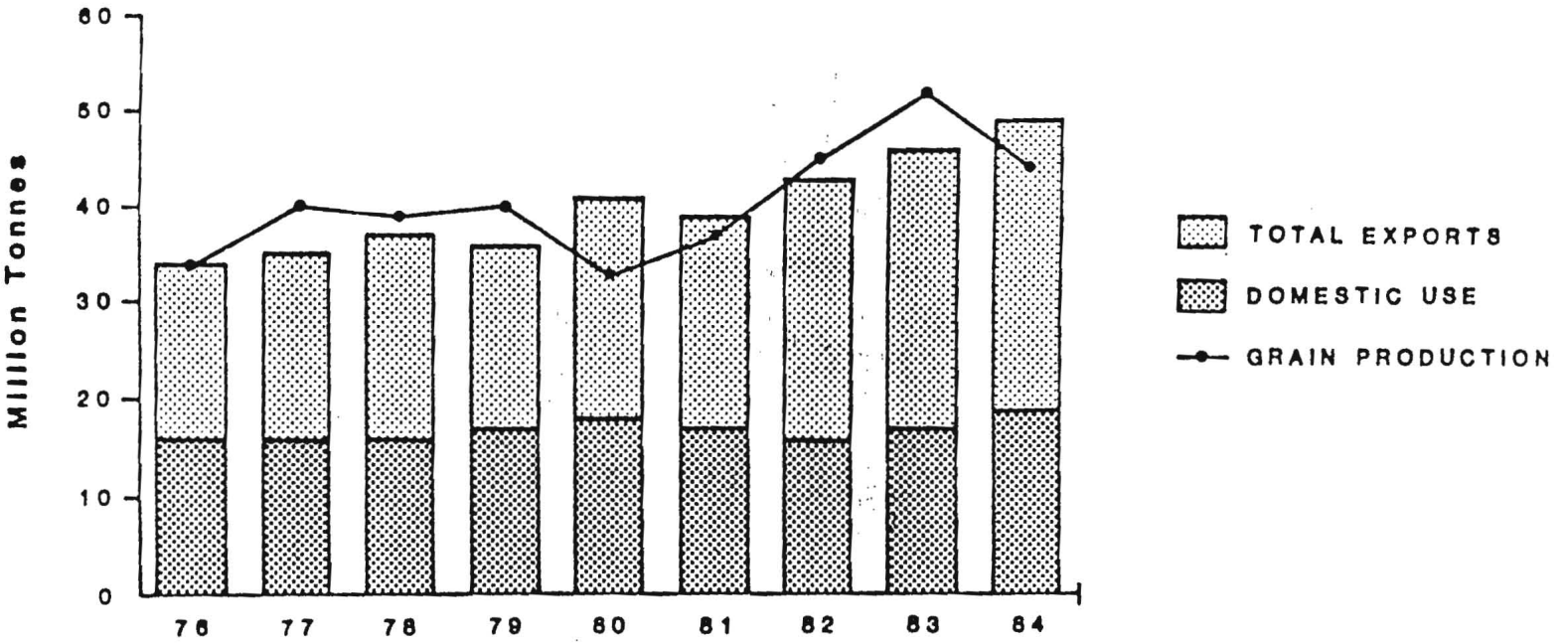
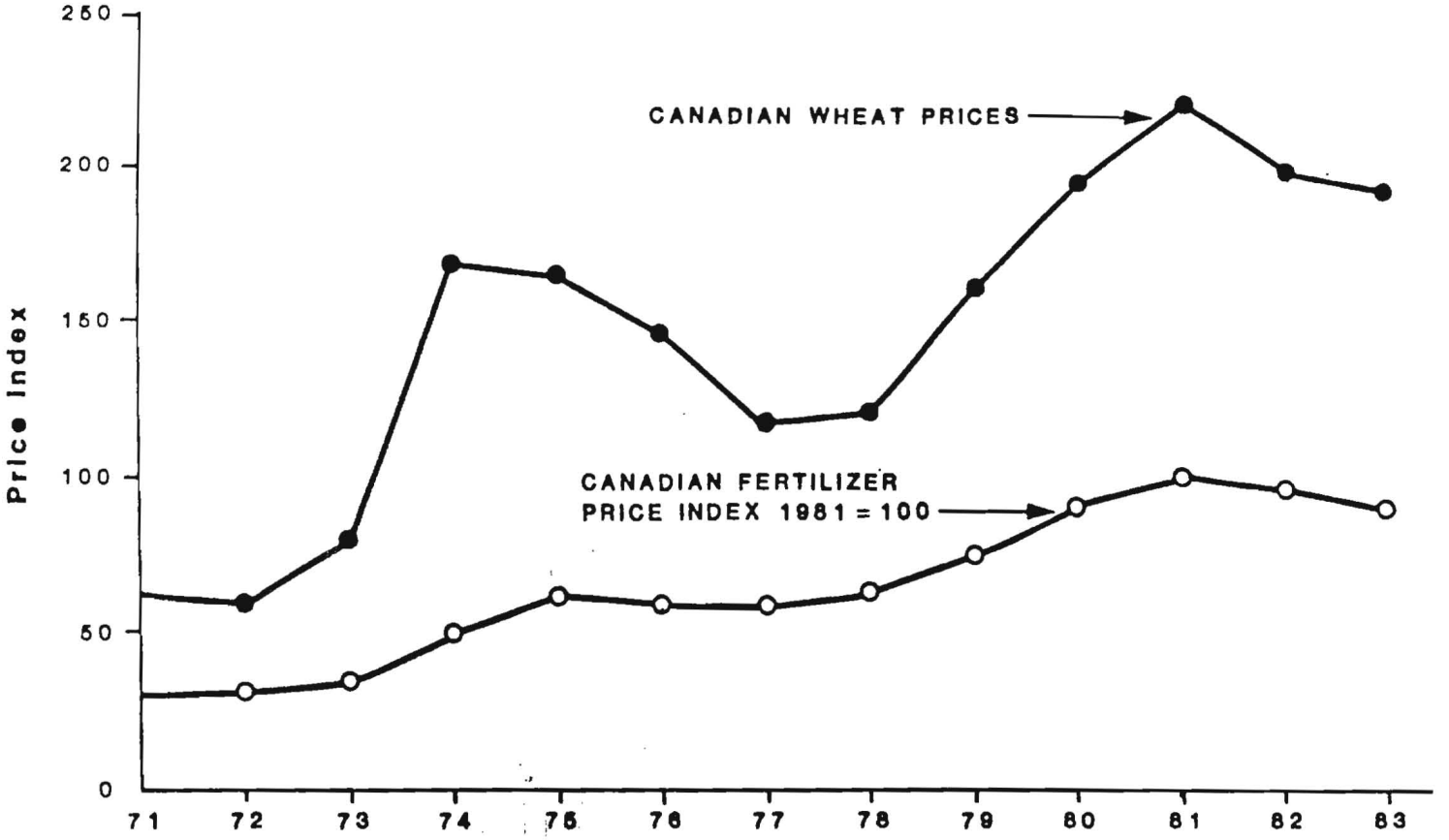
[1]Notes for a presentation to the St. James-Assiniboia In-service, John Taylor Collegiate, Feb. 27, 1987.



SOURCE: Statistics Canada, Grain Trade of Canada Cat. no. 22-201
Statistics Canada, Cereals and Oil Seeds Review Cat. no. 22-007

FIGURE 1: DOMESTIC USE, EXPORTS AND PRODUCTION OF CANADIAN GRAINS



SOURCE: Canada Grain Council, Statistics Canada

FIGURE 2: CANADIAN WHEAT PRICES VS. FERTILIZER INDEX

of the subsidies Canadian production of wheat is expected to remain stable in the 1987-88 crop year.

Current indications are that the United States and the European Community will continue to subsidize their grain producers resulting in a continuation of the current international surpluses of wheat.

Over the last twenty years the Canadian market share of wheat and flour exports has declined from 25% to 17% and the European Economic Community share has increased to 17% from 9%. The market share of the United States has remained stable at 37% although the share increased to a peak of 49% in 1974. Australia's share increased from 9% to 15% and Argentina's share decreased from 13% to 8%. The total volume of world wheat and wheat flour traded in export markets has increased over the twenty year period by 62 percent to 101 million tonnes in 1984-85.

The demand for western grains for domestic and export markets is affected by changes in major uses over time (Table 1). Cereals are primarily used for bread flour and feed. Oilseeds are used for cooking oil and livestock meal. Specialty crops have more diverse uses.

2. Western Canadian Commodity Production

Crop production by province is summarized in Figure 3. In Saskatchewan and Manitoba wheat is the largest volume crop. In Alberta tame and barley production are greater than wheat production. In British Columbia, tame hay is the largest crop which supports dairy and cattle production.

Western Canadian livestock production is summarized in Figure 4. Alberta, Saskatchewan and to a lesser extent Manitoba are major beef producers. Cow/calf operations predominate with feeder cattle shipped to U.S. and offshore markets.

Dairy product production is controlled by federal and provincial regulations. Federal milk price subsidies are a large expenditure by Agriculture Canada. Milk prices are controlled by provincial quota and price regulations. As a result milk production in Western Canada is distributed roughly proportional to provincial population levels.

3. Soil Type and Climate

There is a close correspondence between soil type and climate effects on crop production in western Canada. Brown soils (Figure 5) are associated with a dry climate and low moisture efficiency. Hard red spring wheat is well suited to the growing conditions of a large part of the western Canadian prairie. Yields are highest for black soils in Southern Manitoba through the Parkland belt of Saskatchewan

Table 1

Western Grains and Their Utilization

Group/Crop	Major Uses
1. Cereals	
wheat, spring	bread flour, livestock feed, gluten
wheat, durum	pasta, pastry flour
wheat, winter	bread flour, livestock feed
barley	livestock, feed, malt, some gasohol
oats	livestock feed, breakfast products
rye	distilling, rye flour, livestock feed
2. Oilseeds	
rapeseed (canola)	vegetable and high quality industrial oils, meal for livestock
flaxseed	linseed oil, flax meal
3. Special Crops	
corn	livestock feed, distilling, cooking oil and corn products, gasohol
soybeans	vegetable oils, meal for livestock, food extenders (imports to Western Canada)
mustard	condiment
peas	protein starch and fibre, soups, some livestock feed
lentils	soups, food extenders
sunflower seed	vegetable oil, meal, confections
canary seed	birdseed
forage and grass seed	forage crops, pastures and lawns crop rotations

Source: R.M.A. Loyns and C.A. Carter, "Grains in Western Economic Development to 1990," Economic Council of Canada, Discussion Paper No. 272, September 1984.

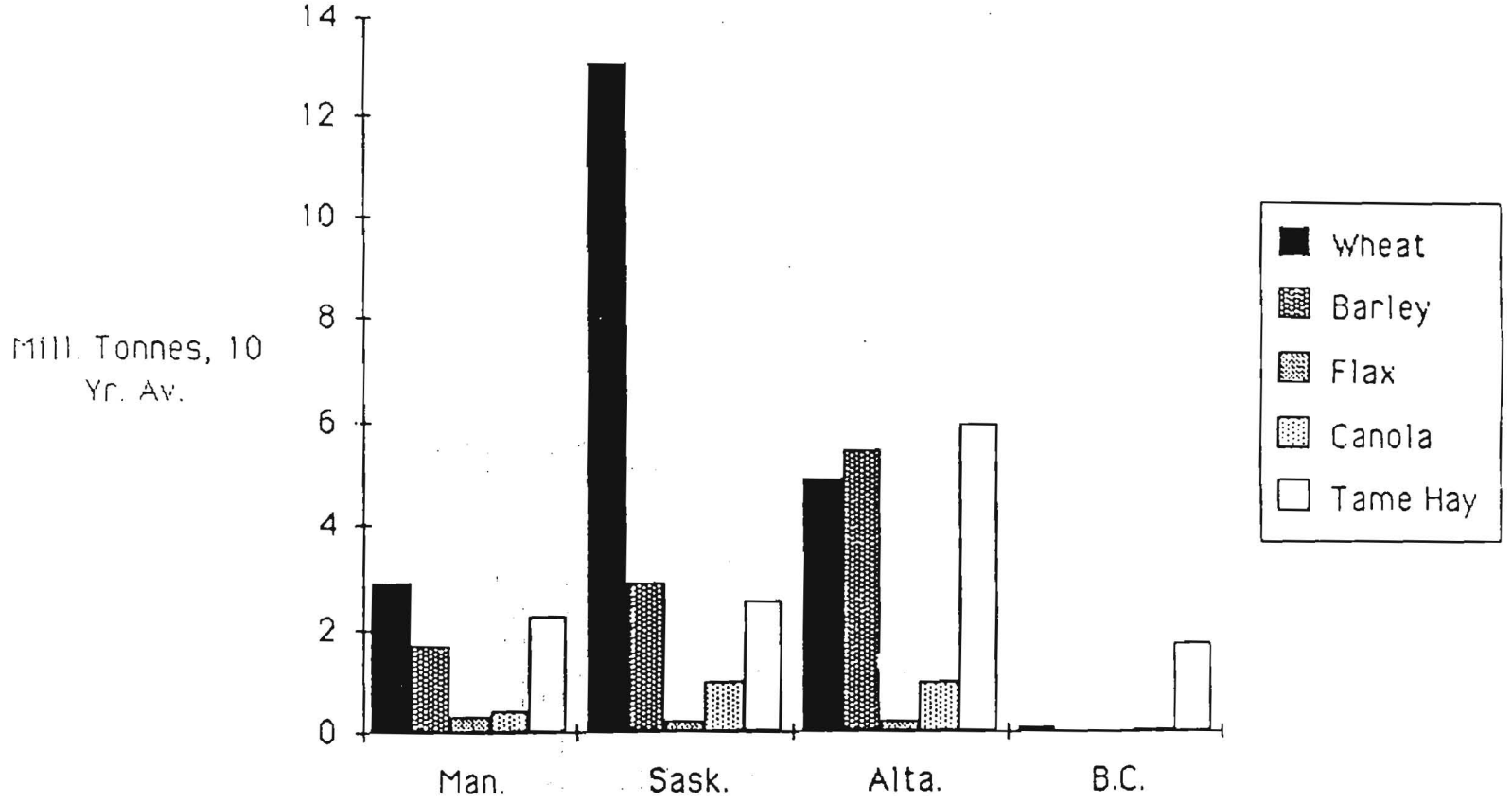


Figure 3

Western Canadian Crop Production, 1981

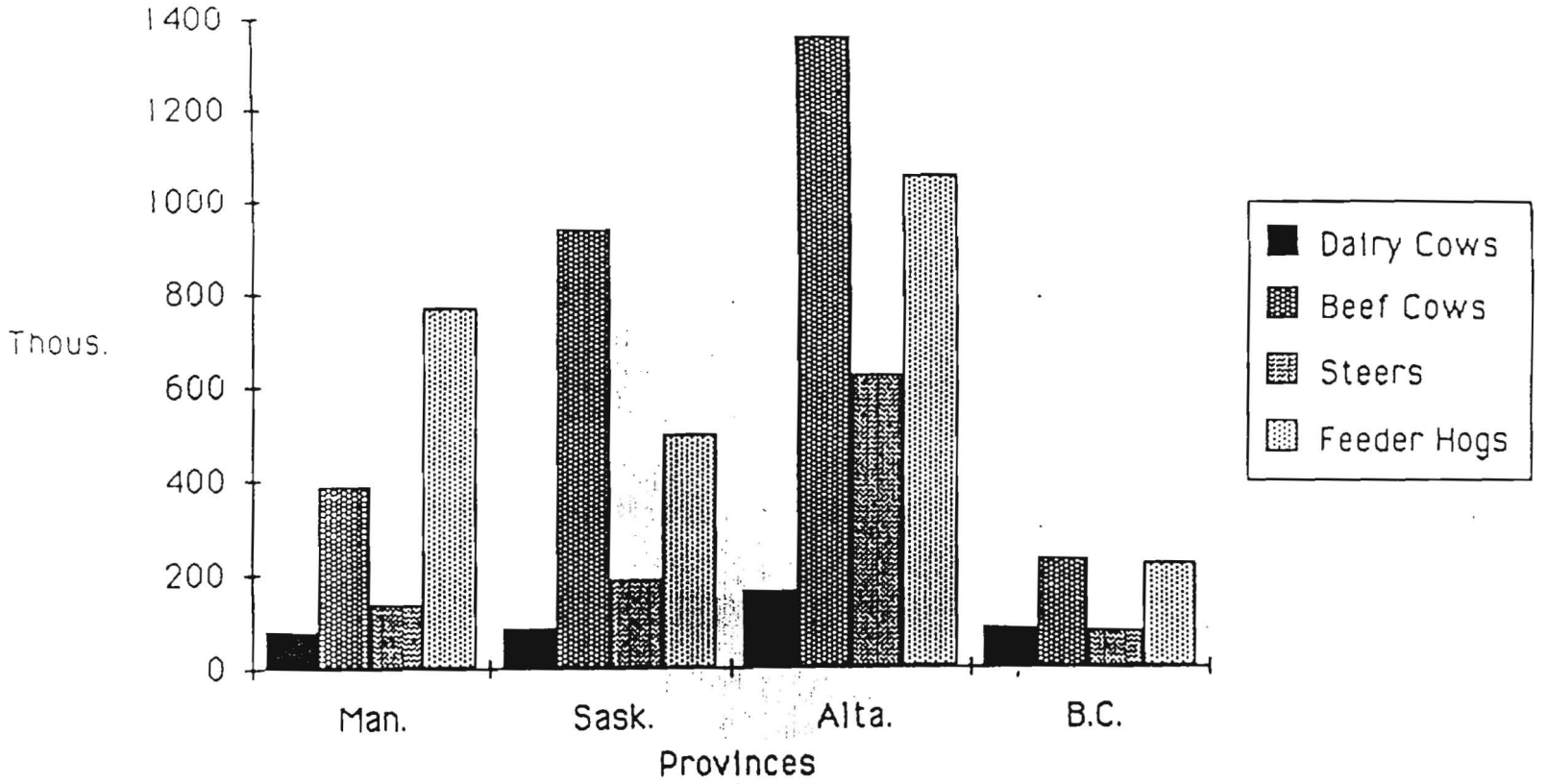
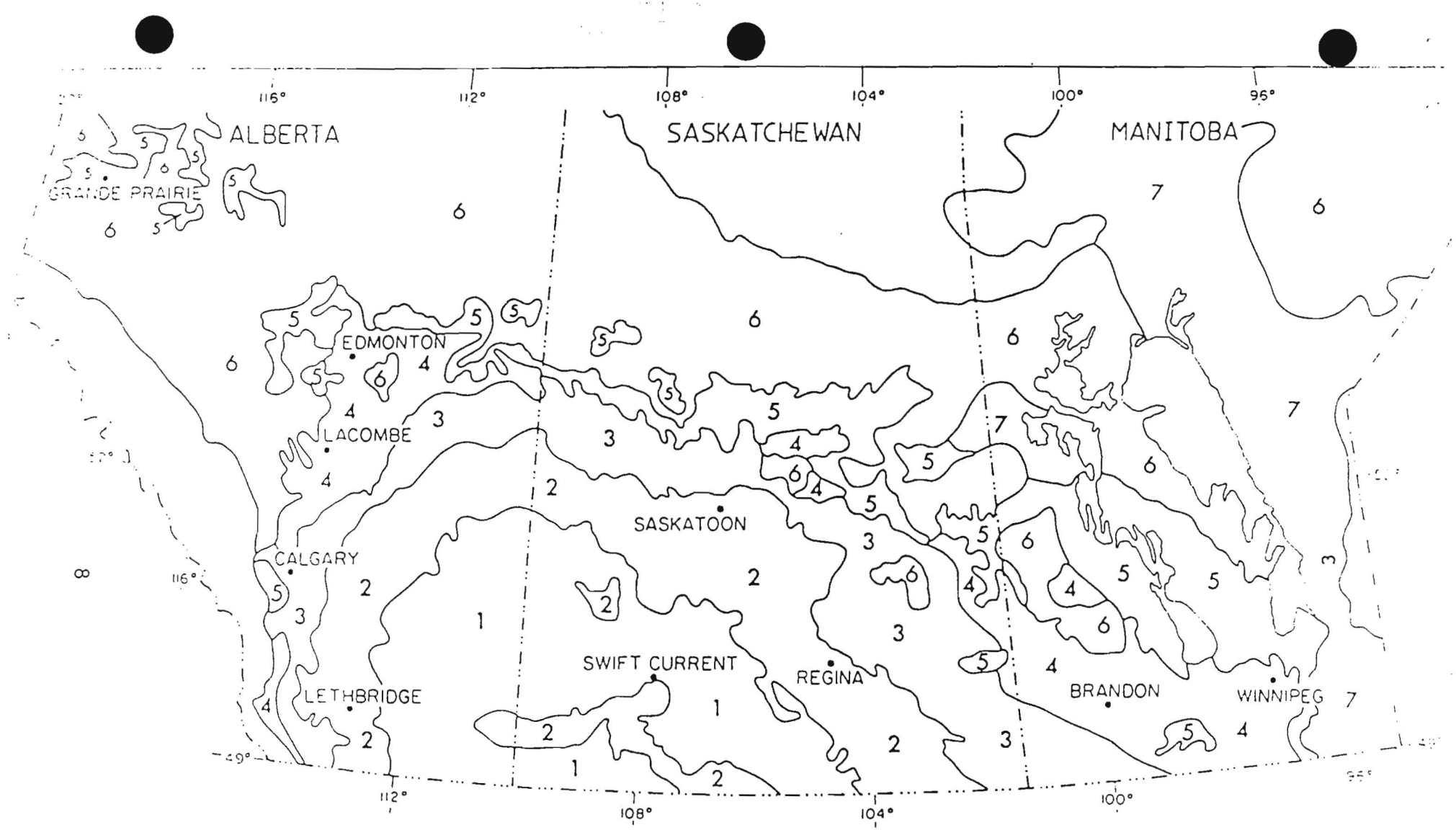


Figure 4

Western Canadian Livestock, 1981



1 Brown soils

2 Dark Brown soils

3 Black soils (thin)

4 Black soils (thick)

5 Black, Dark Grey, Dark Grey Wooded

6 Grey Wooded, Podzol & Peat Bog Soils

7 Peat, Grey Wooded, Brown Wooded

Figure 5

into Alberta around Edmonton (soil types 4 and 5 in Figure 5). These areas have a higher moisture efficiency level than the Palliser triangle which covers south east Alberta and south west Saskatchewan.

4. Technology

Plant breeding technology has major impacts on crops produced in Western Canada. Rust resistant varieties permitted a continuation of the wheat economy on the prairies in the thirties. Canola developed from rapeseed is a recent successful new crop and corn has been recently introduced into Manitoba but has been negatively affected by insects and worse than average heat unit growing conditions. Plant breeders are focussing their efforts on developing new high producing hybrid canola varieties and rust resistant winter wheat.

Biotechnology in livestock production is focussing on developing desirable characteristics of animals (such as white veal meat) through genetic experimentation and the development of more efficient digestion of grasses by cattle.

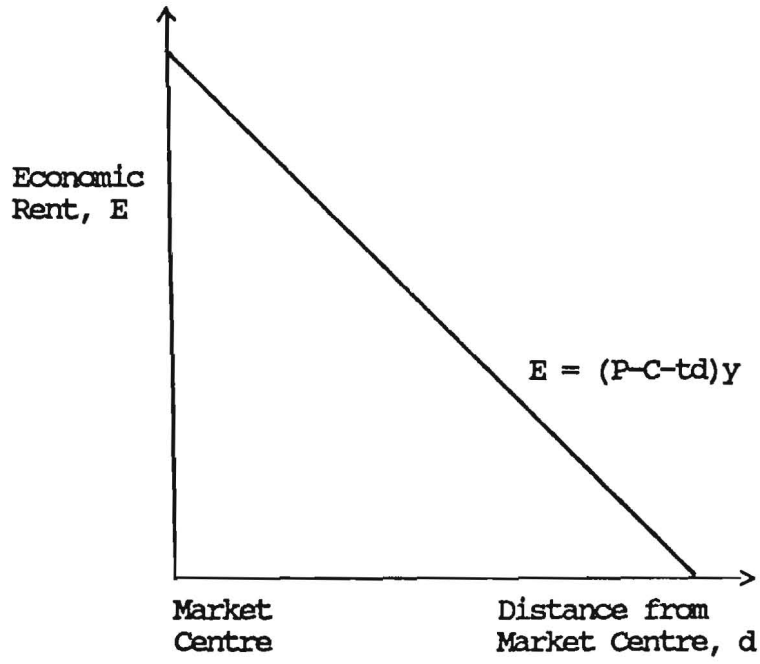
5. Economic Rent and Distance to Markets

Rent distance relations provide a good summary of the interrelation between demand, supply, technical production and distance to market factors as they affect the "What, Where and Why?" of agricultural production. Generally prices are highest for all commodities at a central market location (see Figure 6). High value and weight commodities such as milk are produced close to markets, as is vegetable and greenhouse production. Cow/calf enterprises are primarily dependent on low cost range grass. Calves are produced to be shipped to be fattened at feedlots near major population centers.

6. Farm Production and Agribusiness in Manitoba, 1979

The purpose of this sector is to summarize information on the regional and sectoral structure of farm production and agribusiness in Manitoba. The summary is taken from the study, Economic Structure of the Prairie Region, PFRA, 1985. The PFRA study provides a regional (six regions from Manitoba) disaggregation of the entire economy and sectoral disaggregation of agricultural production (eight agricultural producing sectors) instead of the one region and agricultural sector of the Statistics Canada Interprovincial Input-Output Model.

The data provide a snapshot of the interaction between farm production and food processing activities in 1979 (Figure 7). The major focus of this summary is on the relative magnitudes due to the



Assumptions: 1. Single market in the middle of an agricultural area, 2. uniform environment throughout and access to market, 3. uniform land quality.

Variables:

E - economic rent per unit area
p - price per unit production
c - cost of production excluding transportation
d - distance to market
y - yield per unit area

Source: W.C. Found, A Theoretical Approach to Rural Land Use Patterns, MacMillan, 1971, p. 59.

Figure 6

Linear Rent Distance Function
(Price received for a product after deducting transport costs declines with increasing distance from the market)

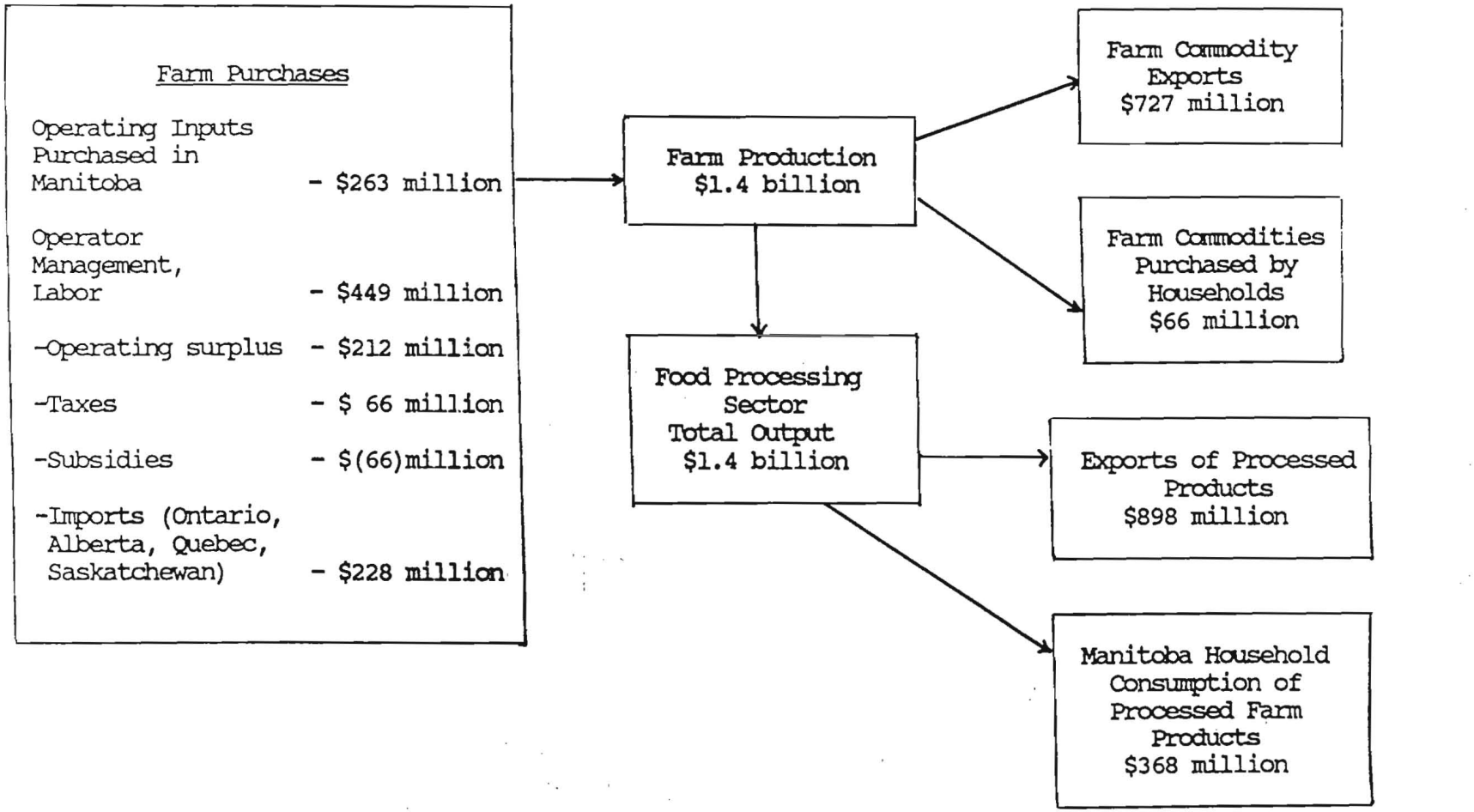


Figure 7

Farm Production and Agribusiness in Manitoba, 1979

significant changes that have occurred since 1979.[2] Farm production of $1.4 billion resulted in $449 million in income payments to farm operations including wages. Exports of farm commodities, $727 million, were less than the value of processed food products, $898 million. Manitoba households provided a significant market for processed agricultural products, $368 million.

The major proportion of (60 percent, $866 million) processing of farm products is located in Winnipeg (Figure 8). Links to other Winnipeg sectors occur for operating inputs of $122 million, to ural regions primarily for farm product inputs of $273 million and to markets outside Manitoba for $386 million. Processed food product exports from Winnipeg ($570 million) make up 63 percent of Manitoba's processed product exports and the purchase of processed food products by Winnipeg households makeup 57 percent of the total Manitoba consumption of processed food products.

The relative proportions of farm production, food processing, exports and imports are summarized for the Brandon region in Figure 9. Regions are summarized in Figure 10. Output and employment multipliers show the summation of direct impacts on the given sector, plus the indirect input purchases from other sectors in Manitoba. The output multipliers are the largest for the feed grain and slaughter processing sectors. Employment multipliers are largest for the grain and cattle sectors. Multipliers for the processing sectors in the Winnipeg region will be significantly smaller in magnitude than the multipliers for the total province because the provincial food processing multipliers include the impacts on the farm production sector outside the Winnipeg region.

For every job gained or lost on farms, another job is gained or lost in other areas of the Manitoba economy. On an income basis, for every dollar of net income produced by primary agriculture in Manitoba, $1.62 is generated in the overall Manitoba economy (see Manitoba Agriculture, Economic Branch, Manitoba Agricultural Review, 1985, 1986, p. 16).

The linkages between agriculture and other sectors are an important factor underlying major agriculture subsidies such as the $1 billion special assistance to Canadian grain producers.

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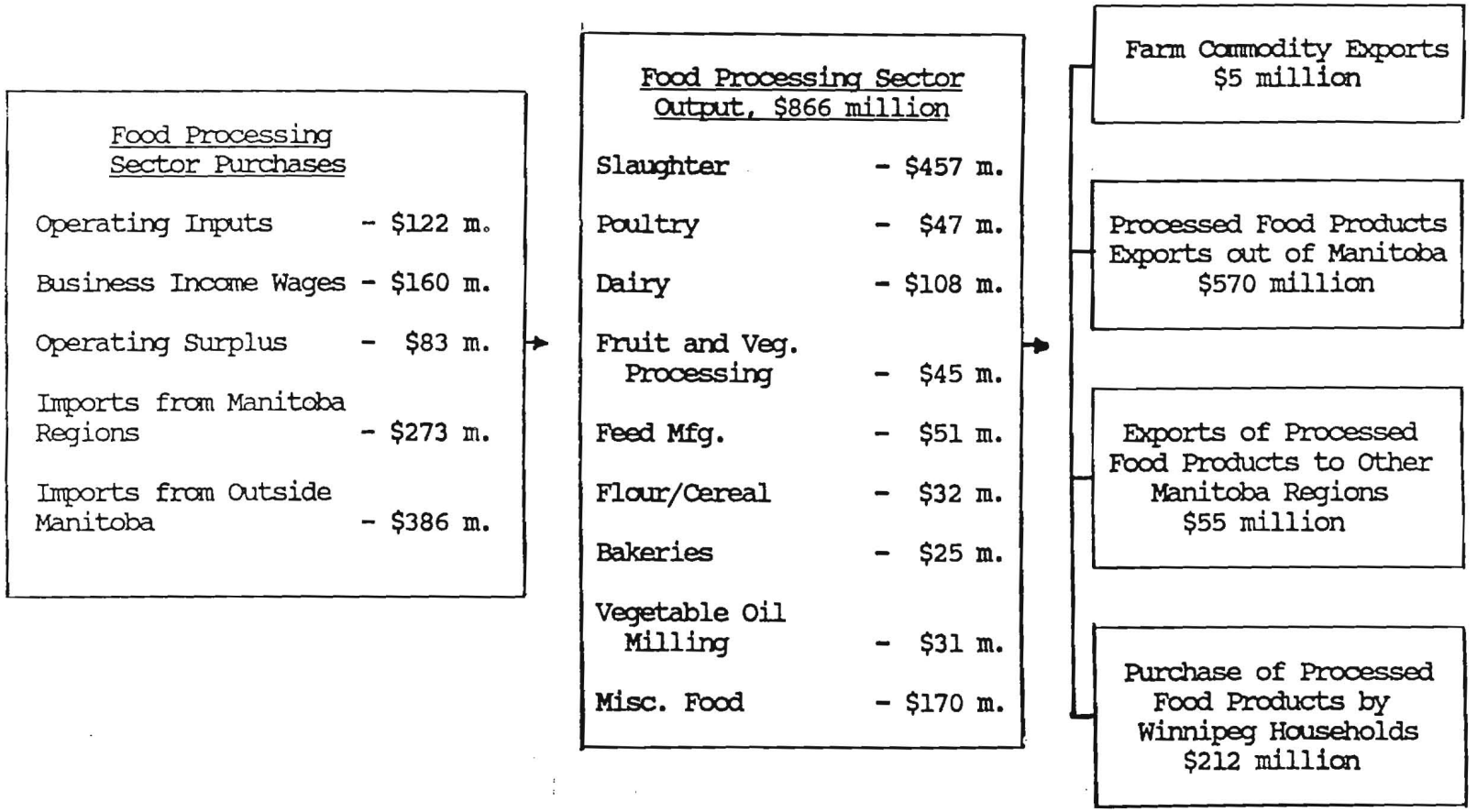
[2]While dollar values have changed since 1979, the basic multipliers and structure will have changed much less. Data for 1979 are the most current available for all sectors of the economy. The Input-Output tables are currently being updated for 1984.



Source: PFRA

Figure 8

Agribusiness in Winnipeg, 1979

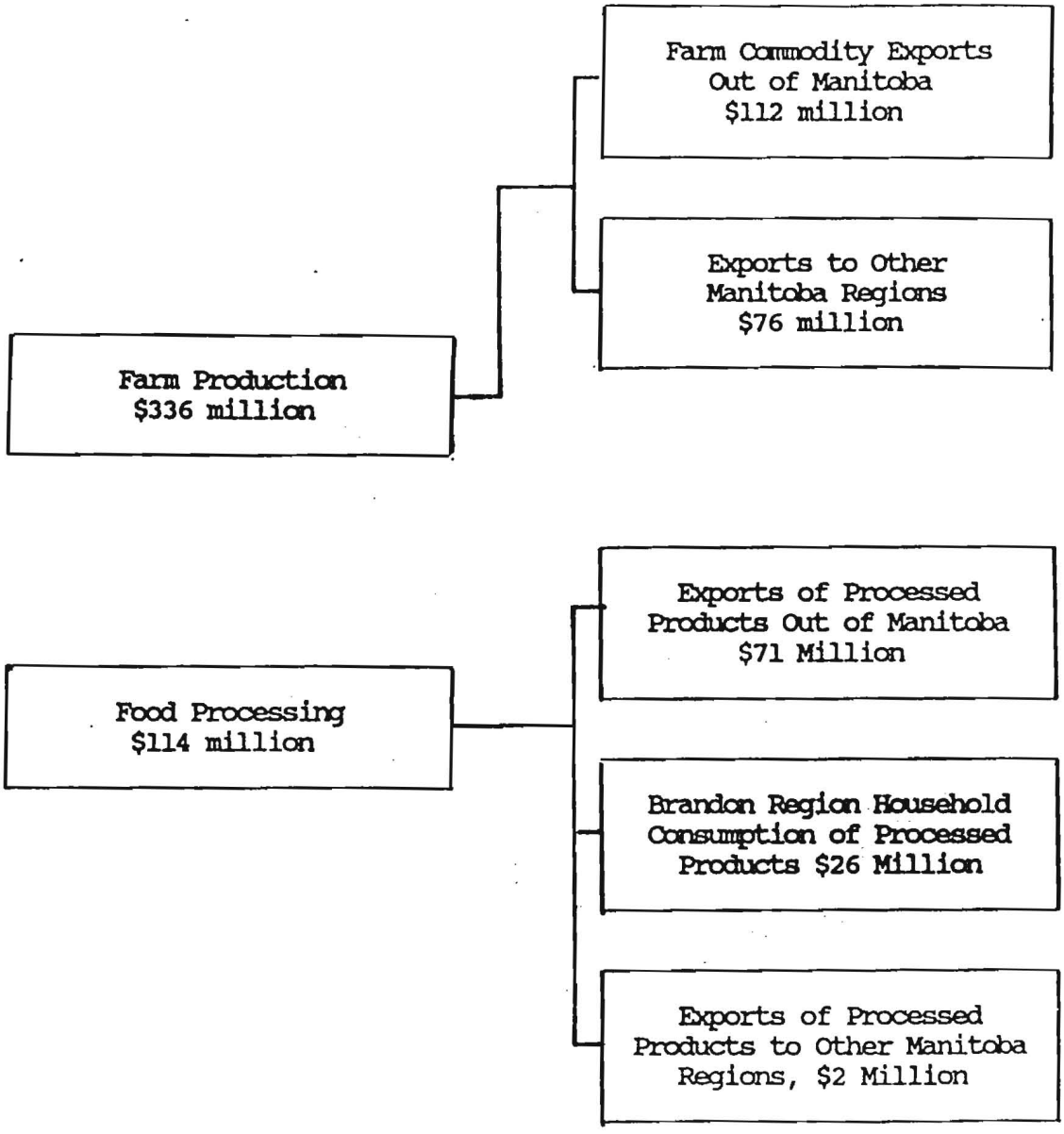


Figure 9

Farm Production and Agribusiness in the Brandon Region
1979

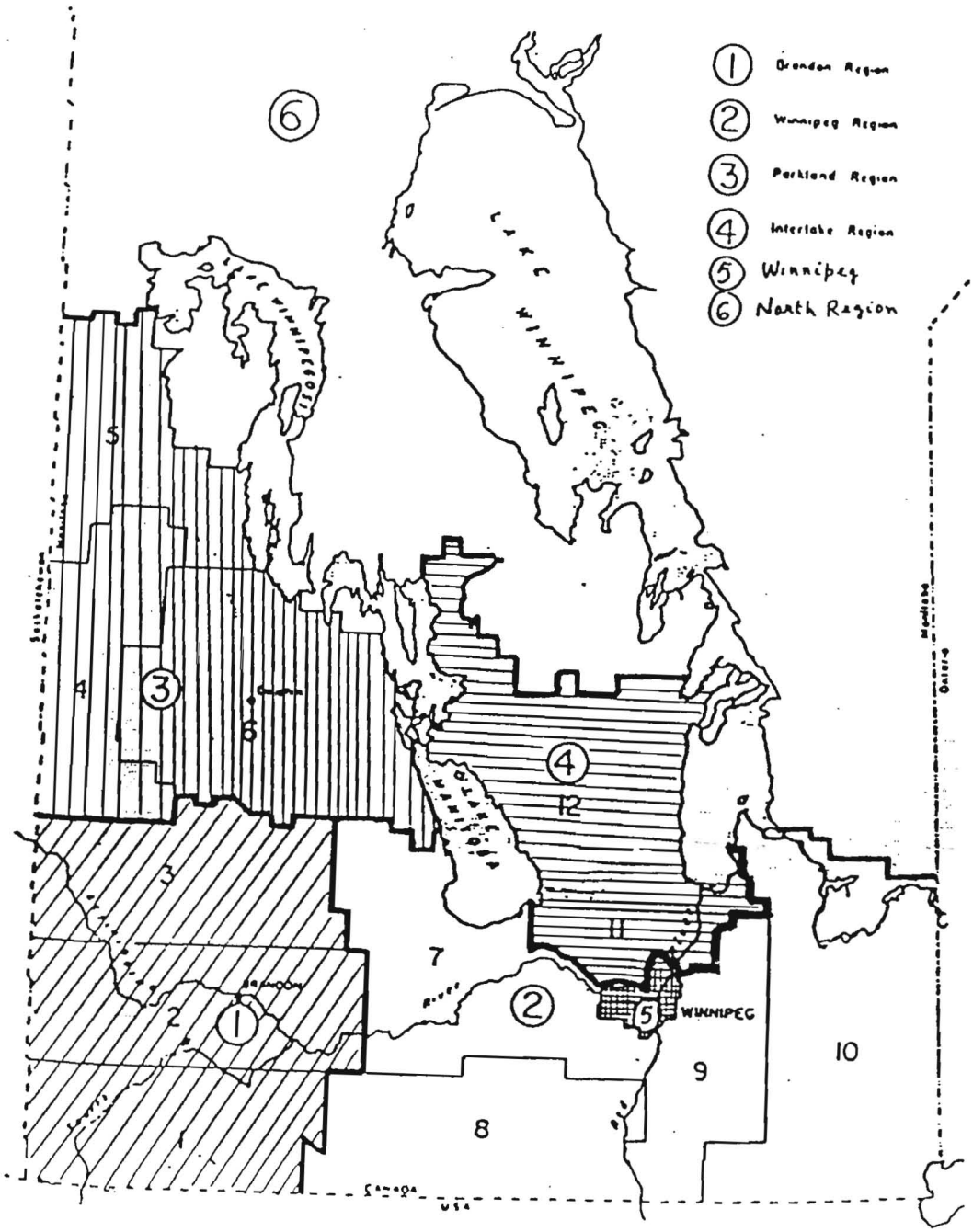


Figure 10

Manitoba Crop Reports Districts and Study Regions