

Changing Canadian Grain Policies: Implications for Montana's Grain Industry

*Linda M. Young, Agricultural Policy Coordinator
Montana State University–Bozeman*

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Summary

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Linda M. Young

In Canada many changes have been made, and more are pending, to their grain transportation policies. This package of policy changes has two *offsetting* impacts on freight rates for Canadian grain producers.

The removal of transportation subsidies on grain for export offshore has roughly doubled the cost of transporting grain for the Canadian producer. In addition, the change in pooling points will increase freight rates even more for producers in the eastern part of the prairies. Whether federally owned grain hopper cars are sold to the railways, or to an association of Canadian producers, the cost of the sale is likely to be born by producers through increased freight rates over a number of years. In addition, Canadian producers will bear the cost of investing in new cars, a cost that was previously born by the government. The combined impact of all of these changes is to more than double freight rates for producers in the western part of the Prairies, with larger freight rate increases for eastern Prairie producers.

A number of other policy changes including rail line abandonment and car allocation procedures, and the privatization of CN railway, are likely to increase the responsiveness and efficiency of the rail system, and to reduce freight costs over the medium to long run. Changes in the elevator system, port privatization and the construction of high throughput country and terminal elevators are likely to increase the efficiency of the grain handling system. In addition, if the correct incentives for investment in grain hopper cars are adopted, it is possible that the shortage of hopper cars that has occurred in the past might be eased, further increasing the efficiency of the delivery system.

The increased cost of exporting to offshore markets has increased the economic incentive for Canadian producers and grain companies to export to the U.S. market. However, due to control of exports by the Canadian Wheat Board, and their concern over the political consequences of large flows of grain to the U.S., those exports may not occur.

The uncertainty surrounding the Wheat Board's actions may make it difficult for grain handling companies to anticipate trade flows and make adjustments to the infrastructure in the United States needed to accommodate increased grain flows.

The large increase in freight rates occurred when grain prices were at high levels, dampening the impact of increased freight rates on Canadian producers. If all other factors remain equal, increased costs of that size are likely to result in a shift in the production patterns on the Prairies. The extent of adjustment will depend on the production alternatives facing Prairie producers.

The large increase in freight rates prompted Canadian transportation specialists to re-examine the feasibility of transshipment of Canadian grain through U.S. ports. Shipping Prairie grain through Pacific North West ports was not found to be cost effective at this time. While the cost of shipping through the Gulf was found to be comparable to shipping through Canadian ports, institutional constraints are likely to prevent substantial transshipment.

Some policy changes are likely to increase the viability of the Canadian rail transportation and handling and reduce the cost of shipping over time. However, it seems unlikely that these efficiency improvements will fully offset the large increase in transportation costs that Canadian grain producers have just experienced. This means that the increased economic incentive for some Canadian producers to ship to the U.S. market, compared to offshore markets, is likely to remain.

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Part One: Background

Introduction

Canadian grain transportation policies are in a period of rapid change. The removal of government subsidies for grain transportation on August 1, 1995 has increased the cost to Canadian producers of shipping grain to offshore export position. At the same time, the location of pooling points was changed, further altering freight rates. The removal of transportation subsidies in Canada could impact U.S. producers, particularly those close to the border, due to the increased economic incentive to export to the U.S. market. Policy changes that have not yet been resolved include grain railcar ownership and allocation procedures. Over the long run, these and other policy changes may increase the efficiency of the Canadian rail system, and slightly moderate the impact of the recent increase in freight rates.

This report discusses a wide range of changes that are occurring in Canadian grain marketing and transportation. Part One describes the removal of transportation subsidies and the change in pooling points, which have recently increased freight rates for Canadian grain exports. Studies that estimate changes in trade flows due to these policy changes are reviewed. The institutional arrangements controlling Canadian exports of wheat and barley and the implications for the U.S. market are discussed.

Part Two reviews the multitude of other policy changes that have either recently been implemented, or that are being debated, that are likely to affect the efficiency of the Canadian transportation system. Possible long run implications for the United States are discussed.

The Canadian Grain Marketing System

The Canadian Wheat Board (CWB) is the sole seller of all Prairie wheat and barley that is exported, or that is sold for human consumption in Canada. This includes wheat grown in the provinces of Saskatchewan, Manitoba and Alberta, and the Peace River Area of British Columbia. Grains under the control of the CWB will be referred to as “board grains.” The domestic feed market, while influenced by Board activities, is not under its direct control. Specialty crops such as canola and flax are not under control of the Board and are marketed by private grain companies.

Key aspects of the Canadian grain marketing system for board grains are price pooling, grain quality control, and extensive government regulation

Canadian grain transportation subsidies have been eliminated and more changes are coming.

*In Canada,
maximum freight
rates for grain are
set by the
government.*

of the transportation of grain. Producers deliver their grain to a pool, which is simply an account for a particular grade of wheat or barley. Revenues from marketing grain and CWB costs are accounted for in these pools. Currently the Board operates four pools—for amber durum wheat, ordinary wheat, feed barley and designated (malting) barley. Producers receive an initial and final payment for grain delivered to the pool, and when prices are higher than expected, an interim payment as well. The initial payment is guaranteed by the Canadian Federal Government. One stated goal of this system is to pool the risk associated with seasonal price fluctuations, infrastructure constraints and marketing costs.

Canada has a stringent system of varietal control for wheat and barley. Only permitted varieties can be received as milling grade wheat by Canadian grain elevators. Regulations concerning varietal control effectively limit U.S. access to the Canadian grain handling and marketing system. Permitted varieties are required to be *visually distinguishable*, meaning that they can be identified by sight. The Canadian Grain Commission is responsible for setting quality standards for Canadian grain and for approving the licensing of new varieties. The Commission is also responsible for the regulation of grain elevators, and in the past, for the setting of maximum tariff rates for grain elevators.

The Canadian Railway System

In Canada there are two railways, Canadian Pacific and Canadian National. Until November of 1995, Canadian National was owned by the Government of Canada. At that time it was sold to private investors, and is now a privately run company. A stipulation of sale was that maximum ownership shares were limited to fifteen percent to guard against anti-competitive behavior.

Canada has 15,248 miles of basic network lines including 6,100 miles of grain dependent branch line. Rail rates are regulated by the Canada Transportation Agency. Maximum freight rates are based on cost estimates and are adjusted for inflation. Freight rates were not increased due to inflation in 1994 and 1995, partially due to the removal of transportation subsidies. Consequently there was a significant increase on August 1, 1996. For a typical movement of 1,026 to 1,050 miles the rate will climb to CA\$34.09 per ton from CA\$31.82 a ton.^{1,2}

Part Two: Recent Changes in Canadian Freight Rates

The Incentive for Canadian Grain Exports to the United States

The relative returns for Canadian grain producers of sales to the United States versus offshore markets is determined by both the prices in those markets and the cost of transporting grain to the delivery point. In Canada, two recent policy changes have substantially increased the cost of transporting grain to offshore export markets. In this section, changes in transportation policies and the resulting increase in freight rates are discussed, and two studies that estimate changes in trade flows due to the policy changes are reviewed.

Removal of the Transportation Subsidies

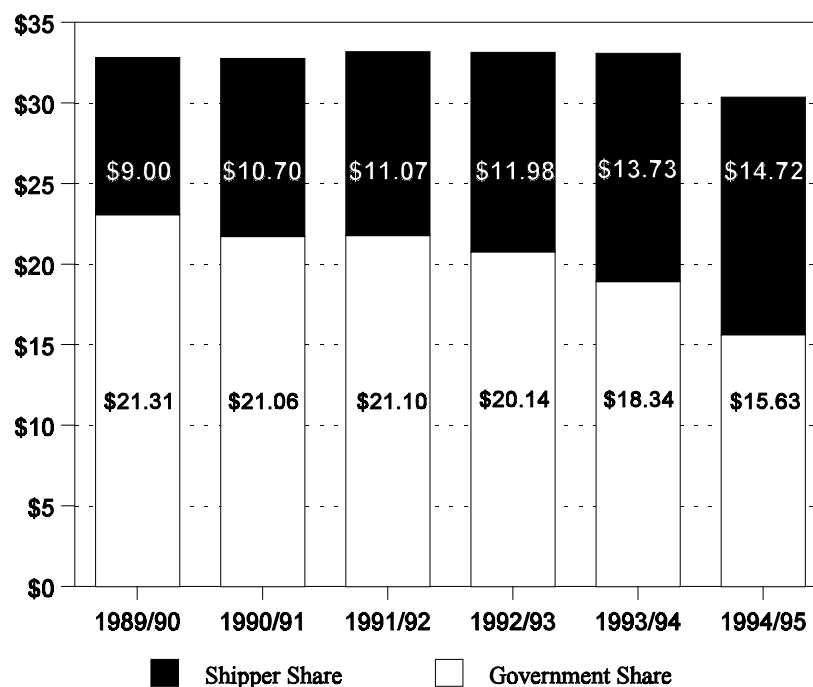
On August 1, 1995 the Western Grain Transportation Act (WGTA) was eliminated, ending a long history of transportation subsidies by the Canadian Federal Government to Prairie grain producers. Under the WGTA the shipper only had to pay a portion, roughly half, of the cost of moving grain to offshore export position, and the government paid the rest (Figure 1). The subsidy was given to a long list of grains and grain products including wheat, barley and specialty crops. Appendix One contains a detailed list of the commodities that were eligible for transportation subsidies.

Under the Canada–U.S. Free Trade Agreement, the transportation subsidy was not given on grain exports to the United States. It was, however, given on grain shipped to Thunder Bay, and some of this grain was then routed back to the United States. The total value of the transportation subsidy was estimated at CA\$560.6² million in the 1994/95 crop year. The elimination of the WGTA will increase the freight rates paid by all Prairie producers on the export of grain to offshore markets. **On average, the cost of shipping grain for the producer will roughly double, from CA\$15 to CA\$30 per metric ton.** For an average length of haul of 1026-1050 miles, the producer must now pay a freight rate of CA\$31.82/metric ton. The largest cost increases will occur in locations farthest from the ports, with producers in the Peace River area of British Columbia and Alberta generally having a smaller increase in freight rates.

*In 1994/1995,
Canadian shippers
paid CA\$15.63 to
ship a ton of grain.*

The federal government is providing a one time payment of CA\$1.6 billion to compensate prairie producers for the loss of the subsidy. An additional CA\$300 million is being provided over three years as adjustment assistance.

Figure 1. WGTA Freight Rates
(CA\$ per metric ton)



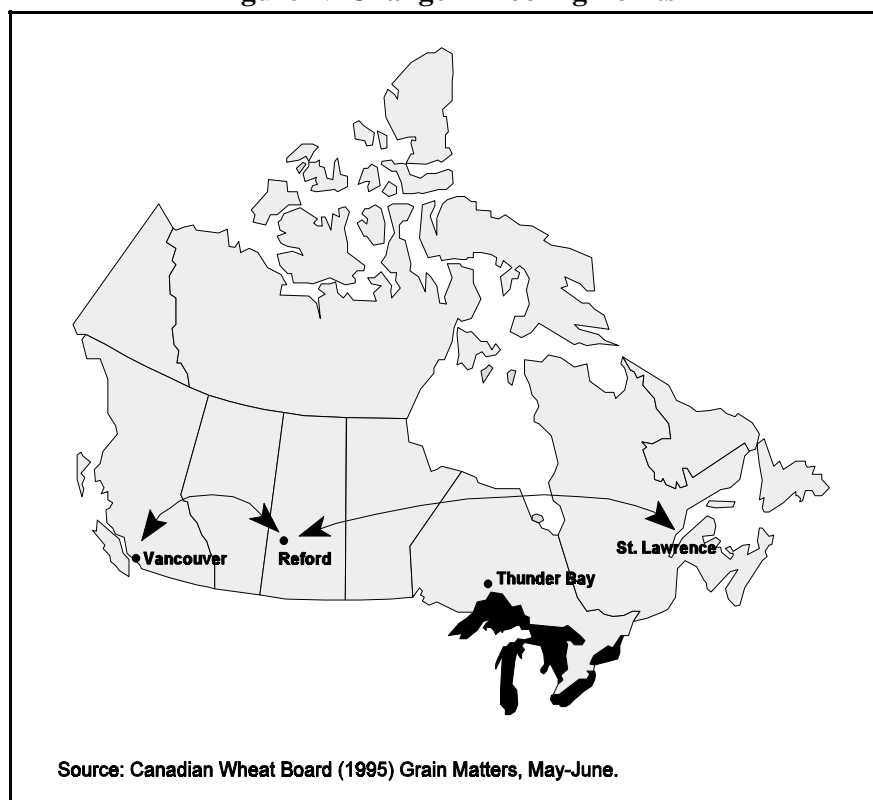
Source: Grain Transportation Agency. (1994). "Moving Canada's Grain: A Digest of Key Facts." Winnipeg, Manitoba.

Freight rates have increased the most in Manitoba and Saskatchewan.

Change in Pooling Points

In Canada, board grains are sold in pools, as discussed on page one. Producers receive an initial payment when they deliver grain to the elevator. A freight charge based on their distance from the closest pooling point is deducted from their payment. Beginning with the 1995/96 crop year, the pooling points have been changed from Vancouver and Thunder Bay to Vancouver and the Lower St. Lawrence (Figure 2). Historically, grain exported from the east and west coasts had a similar value, and roughly equal amounts were shipped from each coast. Over time, a larger percentage was marketed from the west coast resulting in a subsidization of the grain moving through the Seaway.

The change in pooling points is being phased in over three years, and the line that divides the westward and eastward movement of grain will shift east each year. For crop year 1995/96 the line dividing the catchment basin for the Lower St. Lawrence was Reford, Saskatchewan. It is expected to move eastwards to Grenfell, Saskatchewan and then to Brandon or Virden in Manitoba over the next two years. As cost of transporting grain through

Figure 2. Change in Pooling Points

The eastern pooling point has been changed from Thunderbay to St. Lawrence.

the Seaway is shifted to producers east of the dividing line, their transportation costs are expected to increase, depending on their location.³ The federal government has set aside CA\$105 million to provide assistance to producers facing higher transportation costs due to the change in pooling points, including CA\$45 million for the 1995/96 crop year. For some producers, including those in the provinces of British Columbia and Alberta, the change in the eastern pooling point from Thunder Bay to the Lower St. Lawrence means they will no longer be subsidizing transportation costs for producers in the eastern Prairies. Table 1 shows freight rates for representative locations in the Prairie provinces.

Estimates of the Change in Canadian Exports to the United States

There are few publicly available studies that assess the likely change in Canadian grain exports to the U.S. due to increased freight rates for offshore exports. Two studies are described below.

The Producer Panel Report

The Canadian report was prepared by members of the Producer Payment Panel, an appointed panel with representation from industry,

Table 1. 1995/96 Producer Freight Deductions

Delivery Points	Freight Deductions			
	Wheat	Durum	Malt Barley	Feed Barley
Manitoba				
Winnipeg	29.50	18.46	17.95	40.58
Morris	30.69	17.66	17.14	41.77
Arborg	31.29	20.39	19.88	42.37
Portage la Prairie	31.29	20.39	19.88	42.37
Pilo Mound	32.20	18.82	18.31	40.86
Brandon	33.07	22.18	21.80	42.05
Dauphin	34.26	23.37	23.09	40.86
The Pas	32.38	30.63	30.85	40.28
Swan River	36.71	25.82	25.74	40.28
Virden	33.67	22.78	22.47	37.83
Waskada	34.76	21.39	20.88	39.68
Saskatchewan				
Hudson Bay	34.77	28.78	28.93	38.43
Yorkton	36.11	25.22	25.10	38.43
Estevan	36.05	24.42	23.91	36.05
Prince Ibert	36.05	32.41	32.63	36.05
Humboldt	36.05	28.78	28.95	36.05
Moose Jaw	34.42	28.19	28.31	32.42
Saskatoon	33.01	30.03	30.25	33.01
Battleford	31.23	31.23	31.23	31.23
Swift Current	30.04	30.04	30.04	30.04
Consul	35.45	34.20	34.42	34.03
Alberta				
Bonnyville	28.85	28.85	28.85	28.85
Wainright	28.25	28.25	28.25	28.25
Medicine Hat	26.41	26.41	26.41	25.83
Stettler	26.41	26.41	26.41	26.41
Edmonton	25.22	25.22	25.22	25.22
Lethbridge	25.22	25.22	25.22	22.97
Calgary	22.19	22.19	22.19	22.05
Pincher Creek	25.81	25.81	25.81	21.90
High Level	35.45	35.45	35.45	35.45
Grande Prairie	25.81	25.81	25.81	25.81
British Columbia				
Fort St. John	24.62	24.62	24.62	24.62
Dawson Creek	24.62	24.62	24.62	24.62

The freight deduction for grain shipped from Saskatchewan is between CA\$30-36.

Source: Canadian Wheat Board. *Grain Matters*. July-August 1995, pg. 3.

government and academia.⁴ The panel was asked by the federal government to broadly assess the consequences of removing the WGTA. One part of this evaluation contains an analysis using a Canadian model, the CRAM model, that includes estimates of exports of grain to the United States. Three different scenarios are analyzed and the results are summarized in Table 2.

Scenario One: A baseline scenario without major Canadian policy changes that shows the model's predicted exports from Canada to the United States in the year 1999/2000. It assumes restrictions on flows to the U.S. based on the level of exports in 1992/93.

Scenario Two: Assumes that Canada can export to the United States without volume controls. This scenario does not contain Canadian policy changes.

Scenario Three: In this scenario transportation subsidies to offshore export markets are removed and the eastern pooling point is changed from Thunder Bay to the Lower St. Lawrence. No restrictions are placed on exports to the United States.

In the absence of trade restrictions, models predict much larger exports of Canadian grain to the U.S. with the removal of transportation subsidies.

Table 2. Estimated Export Shipments to the United States from Western Canada

000's tonnes	Scenario One	Scenario Two	Scenario Three
Wheat	1436	2085	3047
Feed Barley	113	224	330
Malt Barley	62	50	65
Oats	477	624	1001

Source: *Producer Payment Panel*. (1994). "Delivering the Western Grain Transportation Act Benefit to Producers: Technical Appendix," June, pg. 46.

Exports of wheat, feed and malting barley and oats to the United States have already been larger than exports predicted in Scenario Two, which has unconstrained exports without Canadian policy changes. (The Producer Panel Report was published in 1994, and it is likely that the analysis was performed in 1993.) The reasons for these larger than anticipated exports are discussed on page 10. However, this analysis clearly shows that larger flows of grain are expected to the United States due to these two policy changes.

Study by Johnson and Wilson

Professors Johnson and Wilson analyze the consequences for barley trade flows of the removal of the WGTA.⁵ They use a mathematical programming model to analyze the North American barley market, based on average barley supplies for the years 1989/92.

Base scenario: Their baseline assumes no quantitative trade restrictions, import tariffs on feed barley of \$1 per ton, and the use of export subsidies on U.S. malting and feed barley through the Export Enhancement Program. This results in exports of barley from Canada to the U.S. of 1.6 million metric tons of barley.

Removal of the WGTA: With the removal of the WGTA, and all other assumptions constant (including the use of export subsidies by the United States) exports from Canada to the United States increase to 3 million metric tons, almost twice the predicted level of exports before the removal of Canadian transportation subsidies.

The authors state that predicted trade flows with the removal of the WGTA are likely to be somewhat overestimated. This is because their model does not capture the decrease in production of barley expected in Canada due to increased transportation costs.

It is important to note that Johnson and Wilson's analysis is based on the assumption that the U.S. is using export subsidies for barley. The likely impact of U.S. export subsidies for grain on Canadian-U.S. trade flows is discussed in Box 2.

Exports of Canadian wheat and barley to the U.S. are controlled by the Canadian Wheat Board.

In another article, Wilson, Johnson and Dahl state that opportunities for cross border arbitrage will be heavily influenced by changes in transportation rates. They argue that if existing rail subsidies in Canada are eliminated (or replaced by direct producer payments) there will be enormous pressure to sell Canadian grain into the U.S. market.⁶

Conclusions

There are a limited number of publicly available studies that provide estimates of the impact of the removal the WGTA. **The two reviewed here both conclude that Canadian exports of wheat and barley to the United States would increase substantially with the removal of transportation subsidies if no other barriers to trade existed.**

Institutional Arrangements for Canadian Grain Exports

Even with increased profitability of the U.S. market relative to offshore markets, increased exports of Canadian grain to the U.S. market may

not occur. This is due to the structure of the Canadian grain marketing system, in particular, the role and power of the Canadian Wheat Board.

All exports of wheat and barley are controlled by the CWB, including exports by either individual producers or grain companies to the United States. Canadian producers can “buy back” their grain from the Wheat Board at the local elevator for amounts up to 1,000 tons, and, acting as an accredited exporter of the Board, sell it to buyers in the U.S. market. The CWB sets a daily buy back price, also called the truck price, for this transaction. The Board states that the buy back price is based on the Minneapolis price, adjusted for currency differences and basis. Sales by individual Canadian producers into the U.S. market are a small percentage of total sales to the U.S. market. Sales by Canadian grain companies are much more significant, and the price and quantity of the each sale must be approved by the Board.

Producer Sales

Due to lack of publicly available data, I have not been able to analyze the relationship between the buy back price and the Minneapolis price in order to verify the relationship between the two. Given the political friction that has existed over exports of Canadian grain into the U.S. market, the Board may be motivated by political concerns to set the buy back price to limit sales to the U.S.

In Box One there is an example of the economic factors that must be considered by Canadian producers in their decision about whether to sell to the Board or to the U.S. market. Loynes and Kraut⁷ give an *example* of the relative profitability of the two markets for durum. While the example is only illustrative, Loynes and Kraut argue that the Board sets the buy back price high enough that the U.S. and Canadian markets do not arbitrage. In this case, arbitrage means that trade occurs to the point where prices differ only by transportation costs. They conclude that U.S. producers should be pleased to have the CWB holding back sales in this way.

The buy back system has also been analyzed by Wilson, Johnson and Dahl who state that “Through the buy back mechanism the Wheat Board allows some amount of cross border arbitrage by Canadian producers (i.e., capturing price premiums in selected U.S. markets) while retaining considerable leverage over the overall trade volume.”⁸

CWB Direct and Approved Sales

As the sole marketer of Canadian grain, the CWB coordinates the domestic and international marketing of Canadian grain. The Board states that it provides higher returns for Canadian producers by its ability to discriminate between markets, and to extract premium prices

The Canadian Wheat Board may be restricting sales of grain into the U.S. market.

in some markets. However, these markets are a relatively small proportion of the world market, and around 80 percent of world markets are classified as price sensitive bulk markets for wheat.⁹ This means that while there is some ability to price discriminate in world grain markets, it is likely to be limited. The CWB will choose to sell to the United States when it offers higher returns than other markets, if political concerns are not a factor.

Conclusions

The Canadian Wheat Board controls all sales of wheat and barley to the United States. Market observers have speculated that the Board feels some political pressure to control exports to the United States at levels equal to or below the amount imported between September 12, 1994 through September 14, 1995, when a "Memorandum of Understanding" between the United States and Canada resulted in a tariff rate quota restricting imports of wheat into the United States.¹⁰ A recent report by Canadian transportation specialists observed that, "In theory, the borders are now again free, but restrictions are likely to continue because of fears of U.S. retaliation if there should be a resumption of the heavy movements that occurred immediately before the truce."¹¹ The buy back price, and control over sales by grain companies, allow the Wheat Board to determine the level of exports to the United States.

In 1994 Canadian wheat imports were 3.8% of the amount of U.S. wheat production.

Implications for Montana Producers

The purpose of this section is to assess the impact of imports on the U.S. market price. In order to do this, it is first necessary to consider the level of imports, and how prices are set in the U.S. grains market.

Past U.S. Imports of Canadian Grain

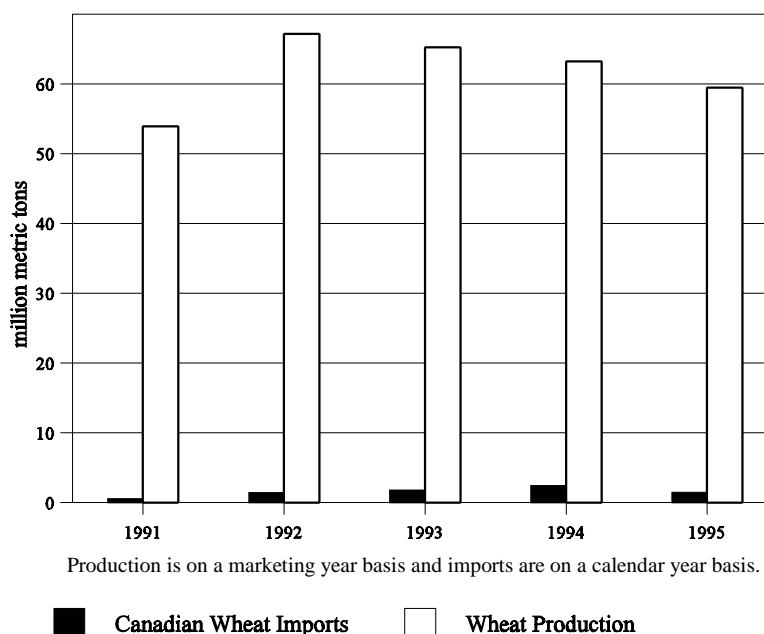
U.S. imports of wheat and barley from Canada have increased significantly in the past ten years, but have been quite variable. As shown in Table 3, in 1991 imports of wheat were around half a million tons. They reached a high of 2.4 million metric tons in 1994, due to a combination of weather factors that produced a short fall of feed grains in the U.S. and an abundance of feed wheat in Canada. In 1995 imports were much lower, in part due to the implementation of the "Memorandum of Understanding" discussed above.

Despite the recent increase in grain imports from Canada, the level of imports has been quite small compared to the size of the U.S. market. This is illustrated in Figure 3 for wheat. In 1994 Canadian wheat imports were only 3.8 percent of the wheat produced in the U.S.

Table 3. U.S. Imports of Wheat, Wheat Flour and Barley from Canada (metric tons)

	1991	1992	1993	1994	1995
Wheat					
Durum Wheat, Ex Sd	320,297	513,356	511,744	364,566	305,755
#1 HRS Wheat	31,331	79,758	35,844	14,583	165,163
#2 HRS Wheat	0	34,081	21,010	40,171	181,574
HRS, No Grade	20,744	342,672	502,452	626,082	315,094
White Winter Wheat	36,954	171,737	145,600	147,482	230,526
CWR Winter Wheat	0	2,079	26,733	120,899	36,903
Sft Wte Spring Wheat	178	27,309	19,129	140,906	173,938
Wheat, No Class	45,072	0	0	0	0
Other Wheat	104,338	283,411	527,921	988,212	73,506
Subtotal	558,914	1,454,403	1,790,433	2,442,901	1,482,459
Wheat Flour					
HRS Wheat Flour	444	729	16,189	65,824	76,837
Durum Wheat Flour	1,458	3,721	8,293	11,883	13,116
Wte Wheat Flour	4,430	11,653	644	1,145	807
Other Wheat Flour	8,512	28,028	53,028	69,137	57,190
Subtotal	14,844	44,131	78,154	147,989	147,950
Barley					
Barley for Malt	309,306	268,045	238,209	710,548	707,832
Barley, NESOI	96,174	172,633	337,110	0	0
Barley, Ex Malt	0	0	0	1,230,936	328,849
Subtotal	405,480	440,678	575,319	1,941,484	1,036,681

Source: Foreign Agricultural Service, USDA

Figure 3 . U.S. Wheat Production and Canadian Wheat Imports

Sources: Foreign Agricultural Service, Grain: World Markets and Trade. USDA, March 1996; Grain and Feed Division, Foreign Agricultural Service, USDA.

Estimated Future Canadian Grain Imports

Estimates of U.S. imports of Canadian grain are presented in Table 4. These estimates are taken from a recent report by the Transport Institute at the University of Manitoba.¹¹ The Canadian Wheat Board estimates that 2 million metric tons of Canadian wheat will be exported to the U.S. in the year 2004/2005, a higher estimate than that made by the Transport Institute.

The Canadian Wheat Board estimates that 2 million metric tons of wheat will be exported to the U.S. in 2004/2005.

Impact of Imports on the U.S. Wheat Price

Economists have presented different estimates of the impact of imports on the U.S. wheat market price. Two estimates of the impact of imports on U.S. wheat prices are presented below, the reasons why they differ are discussed. These estimates can be usefully viewed as giving a range of the potential price impact of wheat imports.

Table 4. Exports of Major Canadian Grains from Prairie Elevators

	Average	Estimates		
	1992/1995	1996/1997	1999/2000	2004/2005
Wheat	0.8	1.0	1.1	1.2
Durum	0.3	0.4	0.4	0.5
Barley	0.7	0.7	0.6	0.6
Canola	0.2	0.3	0.3	0.4
Oats, Rye, Flax	0.3	1.0	1.2	1.3
Total	2.3	3.4	3.6	4.0

Source: Transport Institute, (1996). "Future Changes in Eastbound Grain Traffic." The International Institute for Sustainable Development, The University of Manitoba, pg. 77.

Marsh and Johnson

Marsh and Johnson¹² estimated the relationship between stocks and U.S. farm prices of wheat. Their econometric model investigated the statistical relationship between the level of stocks and the season average wheat price. Marsh and Johnson contend that:

"Such a relationship, at first, can appear to be quite naive because a multitude of economic and political factors can affect world grain markets. However, many of the variables that impact grain markets (i.e., incomes, production costs, interest rates, etc.) can eventually change stock or inventory levels."

They estimate that a one time increase in stocks of ten percent for a single year will decrease the price of wheat by four percent in the next year, and by nearly ten percent after three years.

Marsh and Johnson discuss the impact of imports of Canadian wheat on the U.S. market price. If U.S. exports increased by the same amount as the imports, then it could be concluded that U.S. wheat had replaced Canadian wheat in the export market. However, to conclude that this was the case it would be necessary to assess changes in the level of domestic production and consumption.

They observe that there was an increase in U.S. stocks of eight percent for the 1993/94 crop year, and of that the portion due to Canadian exports was estimated at 0.15 percent (less than two tenths of one percent). Using their regression results, Marsh and Johnson estimate that this resulted in at most a **1.5 to 2 cent drop in the national average price of wheat.**

Economists differ in their estimates of the decrease in the U.S. wheat price due to Canadian imports.

The largest estimate is that Canadian imports in 1993/1994 resulted in at most a 1.5 to 2 cent/bushel drop in the national average price of wheat.

Alston, Gray and Sumner ¹³

Alston, Gray and Sumner investigated the impact of Canadian grain imports on the U.S. market using a simulation model of the U.S., Canadian and world market for durum, milling wheat and feed wheat. Their model explicitly includes production and consumption of these three types of wheat. Their base scenario has milling wheat production in the U.S. of 207.4 million bushels of milling wheat, imports of milling wheat from Canada of 2.5 million metric tons of all classes of wheat and a U.S. market price of U.S.\$2.97 bushel. Reducing imports by half, or by 1.25 million tons resulted in an increase in the market price of only half a cent a bushel, and further reduction of imports to only .625 million metric tons resulted in an increase in the market price of less than one cent.

These results suggest that the price responsiveness of the U.S. market to an increase in imports is very small. Their simulation model uses elasticities of supply and demand that are large in comparison with those used in other studies. This means that a small change in price will result in a rather large change in the amount supplied by U.S. producers, or demanded by U.S. consumers for milling, feed or durum wheat. These adjustments in supply and demand, and the high degree of substitution among types of wheat for different uses and by different suppliers, moderate the impact of imports and result in small changes in price.

Price Determination in the Grains Market

The world price of individual grain is used to allocate the grain between competing uses in the world market. In national markets, policies may influence the amount of grain that is produced and consumed. Policies that affect the consumer price, in conjunction with the fundamental forces behind demand, such as population, income and preferences, will determine demand in a country. Production is also influenced both by national policies and by fundamental forces such as production costs and alternatives. Policies influencing production may include producer prices, credit subsidies and the like. Trade policies, including tariffs, tariff rate quotas, and quotas may be used to separate national markets from the world market.

The amount of grain supplied to and demanded from the world market will determine the world price. Prices for grain may vary between individual markets due to differences in the quality of grain demanded. As markets are separated by transportation costs, to a certain extent prices may also differ due to the ability of sellers of grain to price discriminate between markets. The ability of buyers of grain to exert market power may also contribute to differences in prices.

The U.S. and Canada are both heavily reliant on the world grains market. Between 1990 and 1995 the U.S. exported an average of 53 percent of the wheat that it produced. In contrast, Canada is much more dependent on world markets, with wheat exports averaging 73 percent of its production over the same time span.

The total market for feed grains in the United States is extremely large, with the production of coarse grain for the 1995/96 crop year forecast at 207 million metric tons. This point is important for assessing the impact of Canadian grain imports.

At this time, in the United States the world price of grain determines the domestic price of grain. Price quotes at U.S. ports are adjusted for transportation costs and are the basis for price quotes at country grain elevators. *In the past U.S. policies have at times separated U.S. market prices from world prices.* For example, this occurred due to the loan rates for wheat which kept U.S. prices above world prices. *It has been argued that the Export Enhancement Program raised U.S. prices above world prices and that this was an incentive for Canadian exports to the U.S. market.* This issue is discussed in detail in Box Two. While the Export Enhancement Program has been authorized until the year 2002, due to high grain prices on world markets it has not been used since July 1995. For the 1995/96 crop year no policies are in place that significantly separate U.S. market prices from world prices.

Conclusions

In comparison to the size of the total U.S. market, imports of Canadian wheat are relatively small, being less than four percent of U.S. production in 1994. Empirical studies of the impact of Canadian imports on U.S. market prices conclude that the effect was small. Estimates reviewed here range from less than one to two cents per bushel.

Impact of Imports on Hi-Line Producers and Grain Handlers

The previous discussion indicates that the impact of imports of Canadian wheat on the U.S. market has been minimal. However, it is also important to consider the economic impact on local communities. In Montana the area most affected by imports was the “Hi-Line,” the portion of Montana that directly borders Canada. This is where most of the Canadian imports were delivered to U.S. elevators.

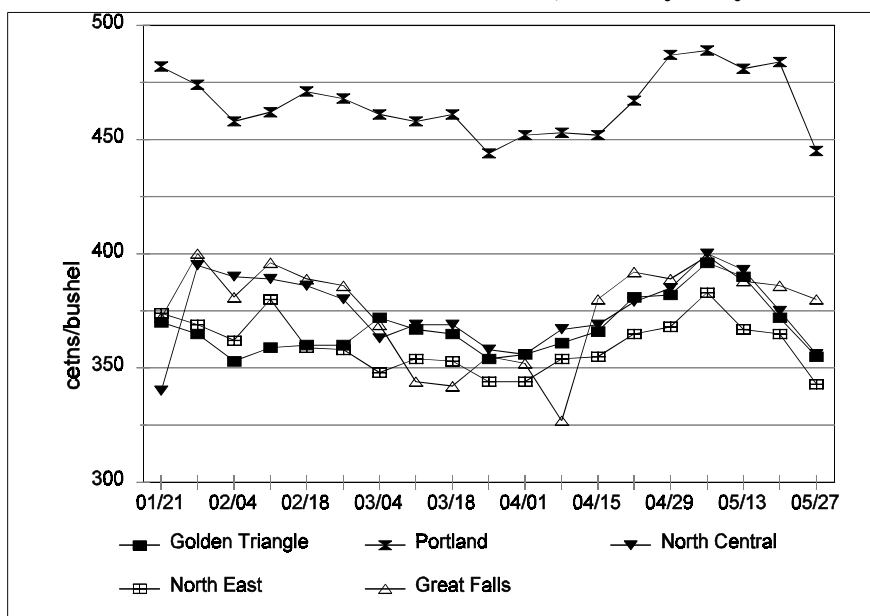
Price Impact

The first question to be considered is whether or not there was a decrease in the price of grain at Montana elevators due to the imports. In general, grain elevators set their offer prices in relation to the price at U.S. ports, minus the cost of transportation. The graph in Figure 4 shows the lowest posted asking price for elevators in four different locations in

The Export Enhancement Program is argued to have increased Canadian exports to the U.S. by raising U.S. grain prices.

Montana,¹⁴ and the posted offer price in Portland¹⁵ for the period of the largest imports of grain from Canada. If the cost of transporting grain was constant over that period, then there should be a constant margin between these elevator prices and the prices at ports in the Pacific Northwest, which is the destination for around sixty percent of Montana's grain. The price for grain at Portland for the same period is shown in the graph in a dotted line. This data indicates that surges of imports of Canadian grain did not result in large price fluctuations at the elevators in the Hi-Line, in North central or Northeastern Montana. The margin that separates these prices from the Portland price appears relatively constant and reflects transportation costs.

Figure 4. Posted Offer Prices at Selected Elevators in Montana and Portland, January-May 1994



Elevator congestion due to import surges has an economic cost for producers in the Hi-Line.

Non Price Effects

Producers in the Hi-Line stated that they were unable to deliver their grain to elevators during the surge of the imports from Canada in 1994. The economic consequences of this inconvenience depend on:

- the level of on farm storage that the producer has available to store his grain for delivery at a later time and,
- how pressing the cash flow needs of the producer are, which will determine whether or not the producer can afford to wait to deliver.

While some economic impact was felt by producers in the Hi-Line, there is little evidence that prices were significantly lower due to imports.

However, producers who were unable to deliver to elevators incurred a storage cost from waiting to deliver, or increased costs from transporting their grain to a more distant location.

Conclusions

The cost of shipping to the offshore export markets has increased suddenly and substantially in Canada. This has changed the relative profitability of the U.S. market compared to offshore markets for Canadian producers and grain companies. At the same time, the U.S. has discontinued the use of the Export Enhancement Program. By raising U.S. prices above world market levels, the EEP is thought to have been partially responsible for Canadian spring wheat exports to the United States.

Even if Canadian producers and grain companies might find the U.S. market attractive, exports to the United States are strictly controlled by the Canadian Wheat Board. It is possible that the Wheat Board has limited sales to the U.S. market for political reasons. However, data is not available to test this hypothesis.

The structure of the Canadian grain marketing system makes it difficult to anticipate the how much grain is likely to be exported from Canada to the United States. The construction of new grain handling facilities along the border indicates that some adjustment in infrastructure is occurring. However, uncertainty over the future actions of the Wheat Board, and thus trade flows, may be impeding the ability of the grain handling sector to make needed adjustments.

The structure of the Canadian grain marketing system makes it difficult to anticipate how much grain is likely to be exported from Canada to the United States.

Part Three: Other Transportation and Handling Policy Changes

Introduction

In the past, Canada's grain handling and transportation system has been extensively regulated. Maximum freight rates are set by the government. Many government policies, such as car allocation procedures, have reduced competition between grain companies. As a consequence, some economists argue that handling charges have been largely passed through to producers.¹⁶ At this time many policy changes are occurring that will reduce the amount of government regulation and increase the market orientation of the railways and the grain handling system. Over time, these changes may increase the efficiency and lower the costs of handling and transporting grain. However, certain aspects of Canada's grain policies, such as the mandatory cleaning of grain for export, and the quality control system for grain are not under review. Continuing these policies will continue to keep handling and transportation costs higher than they might be otherwise.

There are a number of recent and pending changes to Canada's transportation policies. Major changes were made with the passage of the Canada Transportation Act on July 1, 1996. Another set of policy recommendations were made in the Senior Executive Officer's Report (SEO Report). This report was written by a group of industry and government officials who were asked to make recommendations on rail car ownership and abandonment. Some of these recommendations were adopted in the recent budget act.

Railways

Freight Rates: More Changes

Under the recently passed Canada Transportation Act, the government will continue to set maximum freight rates until at least the year 1999/2000, when the continuation of maximum freight rates will be reviewed. Freight rates will be adjusted for inflation and for increases in productivity. Beginning August 1, 1998, the benefit of future increases in productivity will be shared as follows: the railways realize the benefit of the first half of a percent and subsequent productivity increases being shared by producers, shippers and the railways. **Until 1999 freight rates will continue to be regulated by the government and increases will be limited to increases in inflation or costs, and subject to government approval.**

Maximum freight rates for grain will be set by the government until at least 1999.

Rail Line Abandonment

In Canada there are 6,000 miles of grain dependent branch lines. Previously it was extremely difficult for railways to abandon branch lines, leading to the maintenance of branch lines considered uneconomic by the railways. It has been estimated that the elimination of 1,400 miles of branch line would provide a cost savings to the railways of CA\$25 million to CA\$30 million a year.

The "Robson Process" was initiated in 1994 to facilitate rail line abandonment on a one time basis. In this process 535 miles of branch lines have been identified as economically feasible to be abandoned, for a saving of an annual CA\$14 million.¹⁷

In a significant shift in policy, new abandonment procedures were implemented on July 1, 1996. That made it much easier for railways to abandon branch lines. CN railway announced that it would abandon 2,361 kilometers of branch lines in the Prairies.¹⁸ As the productivity sharing plan described above will not start until 1998, the railways will realize the entire benefit of the cost reduction associated with branch line abandonment.

Railcar Allocation and Ownership

There are roughly 18,850 dedicated grain hopper cars owned by the government in Canada. Of these the federal government owns 15,000, the Canadian Wheat Board owns 2,000 and the Provincial governments of Alberta and Saskatchewan each own 1,000. In the past the federal government bought the grain hopper cars and provided them to the railways at no cost. The former Grain Transportation Agency estimates that this subsidy was worth an estimated CA\$2.90 per tonne.¹⁹ The Government of Canada has announced that it will sell its entire fleet of grain hopper cars during 1996, and the future ownership and the sales price of these cars is in question. Producer groups, the railways, and the Wheat Board, have all expressed a desire to own the grain hopper cars. Regardless of how the car ownership question is settled, grain shippers are expected to pay an additional CA\$0.75 per ton in freight rates to compensate the buyer for the purchase cost.

Changes in branch line abandonment, railcar ownership and allocation, and port and route parity should increase cost effectiveness.

Another policy that is in the midst of being changed is the system of railcar allocation. Previously, railcars were assigned to grain companies through a complicated allocation procedure that was administered by the Grain Transportation Office (GTO). The CWB has played important role in this process. The legislation that abolished the Western Grain Transportation Act also abolished the GTO and established the Western Grain Transportation Office. Despite the change of the name of the office, procedures have remained relatively constant, as recommendations for a new allocation system are being developed and studied. The SEO report recommends that the Western Grain Transportation Office be abandoned and that a Car Allocation Policy Group be created to develop guidelines regarding car allocation. They advise that the CWB's role be minimized and that allocation procedures move to a "commercial basis," although the meaning and implications of that wording are unclear.

Changes in car ownership and allocation procedures are important because the government is reducing its role, and that of the Wheat Board, in the transportation of grain.

Ports**Port Privatization**

The Canadian Minister of Transportation has announced a new National Marine Policy that would free major commercial ports from the control of the federal government.²⁰ This legislation would change the status of these ports from crown agencies to not-for-profit corporations. It is anticipated that freedom from federal regulations will increase the efficiency and the profitability of the ports.

In addition, the Government of Canada is evaluating the privatization of the operation of the Canadian portion of the St. Lawrence Seaway.²¹

Port and Route Parity

Previously, due to a policy of port and route parity, equal rates were charged on the transportation of grain from Edmonton to Vancouver and Prince Rupert. This was done despite the fact that the distance to Prince Rupert is 184 miles longer from Edmonton than Vancouver. Also, freight costs from Calgary and Edmonton to Vancouver were equal, and this policy also has been eliminated. Port parity and route parity have been abolished as a part of an effort to increase the market orientation of the Canadian rail system, and should eventually lead to more efficient patterns of the production and transport of grain.²²

Consolidation of county grain elevators is expected to continue and increase.

Grain Elevators

Rapid change is also occurring in the size, function and location of country grain elevators. In the past, both the procedures used to allocate cars and the maintenance of grain dependent branch lines are thought to have impeded the process of abandoning smaller grain elevators for larger and more efficient elevators.

Grain Elevation Tariffs

Prior to August 1, 1995 the Canadian Grain Commission set maximum tariffs for country, transfer and terminal elevators. These maximum tariffs applied only to Board grains, with the tariffs for non board grain being set without regulation. Grain companies could set their tariffs to be less than or equal to the regulated maximum rate. Since that date the Canadian Grain Commission no longer sets maximum rates.²³ Grain companies are only obligated to inform the Commission of the maximum rate that they charge. Since deregulation there has been little change in tariff rates.²⁴ Some country elevators are now charging on a gross, rather than a net basis, which increases the cost to producers by the amount of the dockage.

Trends in the Size and Location of Grain Elevators

In 1995 there were 1340 licensed primary elevators, 14 transfer elevators, and 18 terminal elevators in Canada.²⁵ The number of country elevators has declined rapidly in recent years, decreasing by 32 percent in the eleven years preceding 1995/96, while the capacity has declined by only 18 percent (Table 5). The province of Manitoba has experienced less concentration of its country grain elevators, having a decrease of only 23 percent of its elevators over this time.

The consolidation of country elevators is expected to continue, and increase, due to the policy changes discussed here. In the past, both the inability of railways to abandon branch lines, and the procedures used by the CWB to allocate cars, are thought to have maintained smaller and more costly elevators.

The Manitoba Pool, a farmer owned cooperative which owns fifty percent of the elevators in the province of Manitoba, has announced that it will close at least one third of its 130 elevators in the next three years. This would leave it with just 80 elevators by 1998. The Cooperative has stated that elevators that did not handle at least 15,000 tons in 1996 would be closed.²⁶

Several new grain elevators are planned or are under construction. Cargill and the Saskatchewan Wheat Pool have announced that they will build a high throughput ocean terminal at Roberts Bank, British Colombia.²⁷

**Table 5. Canadian Grain
Number of County Elevators***

Crop Year	Number	Capacity (metric tonnes)
1962/63	5,226	10,290,640
1983/84	2,800	8,035,480
1984/85	1,967	8,005,720
1995/96	1,340	6,563,630

Note: Effective the 1984/85 crop year the Canadian Grain Commission allowed operators of primary elevators to house two or more adjacent facilities, which were under the control of a single manager, as a single primary elevator. This change accounts for most of the large drop in elevator numbers between 1984/85 and 1995/96.

*Source: Canadian Grain Commission (1996). "Grain Elevators in Canada: Crop Year 1995/1996," Winnipeg, Manitoba.

Many of the high throughput elevators which are under construction or in the planning stages will have the capacity to clean Canadian grain to export standards. The incentive to clean grain before it is shipped to export terminals has been increased by the removal of the transportation subsidies, as the cost of transporting dockage has increased. Increased transportation costs is also one motivation for a trend of more livestock feeding on the Prairies, which increases the demand for dockage.

Inland cleaning of grain and "direct hit" shipments are expected to increase.

Table 6. Estimated Rates for Western Canadian Grain Exports
(CA\$/tonne*)

Origin	Export Port	
Calgary	Vancouver	Portland
Wheat	42.67	55.71
Barley	44.88	61.46
.....		
Edmonton		
Wheat	41.66	59.30
Barley	44.88	59.05
.....		
Moose Jaw		
Wheat	50.07	79.84
Barley	53.10	82.27

* assuming CA\$1 = US\$0.74

Inland cleaning of grain and “direct hit” shipments are expected to increase.

The movement to inland cleaning is anticipated to have several consequences; it should reduce the cost of transporting grain as the dockage will no longer be shipped to port. While other factors may limit the flow of Canadian grain through U.S. export facilities, inland cleaning will eliminate one of the current constraints. Inland cleaning is also expected to have an impact on the development of the port facilities in Canada. The function of elevators at ports could be reduced to that of a transfer facility.

Some Canadian elevators are attempting to develop the concept of “direct hit” shipments on grain.¹¹ This is when export ready grain is assembled on the prairies and unit trains are dispatched in anticipation of the arrival of a specific vessel in port. While the implementation of this concept is more advanced for specialty crops, it is an indication of how grain shipping might progress.

Evaluation of Transshipment of Canadian Grain for Export Through the United States

Due to the substantial increase in freight rates in Canada, it is appropriate to evaluate if transshipment of Canadian grain for export through the States is a viable option. A recent study compares the cost of shipping through U.S. Pacific Northwest ports and through U.S. Gulf ports with the cost of shipping through Canadian ports.¹¹

U.S. Pacific Coast Ports

While several Pacific ports have the capacity to handle increased shipments of grain, the cost of this route for Prairie grain is much higher than shipment through Vancouver. This conclusion held for Prairie grain from several representative locations, as shown in Table 6. The cost difference is due both to higher distances and the rates currently charged for captive grain by BN railroad.

U.S. Gulf Ports

For shipment of Canadian grain through U.S. Gulf ports, the cost of Rosetown to Quebec was compared to the cost of shipping to New Orleans. These figures are shown in Table 7. While the report finds that a rail barge combination to New Orleans is competitive with export through Quebec, the report expresses a cautionary note. The authors argue that barge rates are extremely volatile and that rates should be expected to increase with an increase in demand. In addition, as the rates do not reflect the full cost of maintaining the waterway, they recognize that large shipments of Canadian grain through the waterway would be a subsidy to Canadian exports that they do not expect would continue very long.

It is unlikely that much Canadian grain will be shipped through the Gulf, although the basic shipping costs are comparable.

Table 7. Estimated Rates for Eastern Canadian Grain Exports
(CA\$/tonne*)

Rosetown to Quebec City	
Rail to Thunder Bay and Laker	55.49
Direct all Rail	54.51
Rosetown to New Orleans	
All Rail	58.49
Rail and Barge	55.01

* Assuming CA\$1 = US\$0.74

The costs evaluated only consist of transportation costs and do not include adjustments for the additional cost of maintaining the identity of Canadian grain, or of inspecting it at U.S. ports. These measures are necessary to meet Canadian grain regulations which are designed to market Canadian grain as a distinct product. In addition, Canadian grain must be cleaned to their export standards before shipment overseas. While some grain is now cleaned at inland terminals, the transition is not complete and poses an additional institutional constraint.

Given the cost of exporting through U.S. ports and the continuing institutional constraints that would have to be overcome, it is not likely

that much transshipment of Canadian grain through U.S. ports will occur at present U.S. rail rates even though Canadian rail rates have roughly doubled.

Summary

Table 8 summarizes key characteristics of the Canadian grain handling and transportation system, what potential changes are being considered and their potential impact on handling and transportation costs.

Table 8. Policy Changes and Impacts

Current Policy	Potential Change	Potential Impact
Railcar Allocation	less CWB involvement, allocation by zone	greater shipper flexibility, however, still no price incentives in the allocation process
Railcar Ownership	sale from government to either the railways or producer groups	producers will bear the cost of ownership and maintenance either directly or through increased rail rates
Freight Rates	CTA: maximum rates until 1999	rate maximums regulated
Rail Line Abandonment	ease abandonment requirements	increase efficiency of rail transport, increase use of trucking
Port and Route Parity	elimination of policy	increase efficiency
Port Ownership	privatization of ports	increase efficiency
Quality Control System	none currently being examined	none
Cleaning Requirements	none currently being examined	none

Canadian transportation specialists recently estimated that increases in rail productivity could contribute to a substantial decrease in freight rates over the long run.¹¹ They note that rail productivity in Canada has

increased by 3 percent annually, on average, over the past three decades. Future productivity gains are likely to accrue from a decreased branch line system, an increase in the use of high throughput elevators, a larger number of car loadings at each origin and other changes. They estimate this would reduce rates from CA\$31.82/t for an average haul of 1026-1050 miles to CA\$21.30 in the year 2004/05 (this cost is estimated in 1995 dollars).

Conclusions and Implications

The package of policy changes occurring in Canada at this time have two *offsetting* impacts on freight rates for Canadian grain producers.

- The removal of transportation subsidies on grain for export offshore has roughly doubled the cost of transporting grain for the Canadian producer. In addition, the change in pooling points will increase freight rates even more for producers in the eastern part of the prairies. Whether the grain hopper cars are sold to the railways, or to an association of Canadian producers, the cost of the sale is likely to be born by producers through increased freight rates over a number of years. In addition, Canadian producers will bear the cost of investing in new cars, a cost that was previously born by the government. The combined impact of all of these changes is to more than double freight rates for producers in the western part of the Prairies, with larger freight rate increases for eastern Prairie producers.
- A number of other policy changes including rail line abandonment and car allocation procedures, and the privatization of CN railway, are likely to increase the responsiveness and efficiency of the rail system, and to reduce freight costs over the medium to long run. Changes in the elevator system, port privatization and the construction of high throughput country and terminal elevators are likely to increase the efficiency of the grain handling system. In addition, if the correct incentives for investment in grain hopper cars are adopted, it is possible that the shortage of hopper cars that has occurred in the past might be eased, further increasing the efficiency of the delivery system.

While the economic incentive for increased exports to the U.S. market currently exists, as previously discussed, control of exports by the Wheat Board means that these sales may not occur. The uncertainty surrounding the Wheat Board's actions may make it difficult for grain handling companies to anticipate trade flows and make adjustments to the infrastructure in the United States needed to accommodate increased grain flows.

*Uncertainty over
Wheat Board actions
may impede
adjustments to
infrastructure.*

The large increase in freight rates occurred when grain prices were at high levels, dampening the impact of increased freight rates on Canadian producers. If all other factors remain equal, increased costs of that size are likely to result in a shift in the production patterns on the Prairies. Forthcoming research will discuss estimates of the shift in production that may occur. The extent of adjustment will depend on the production alternatives facing Prairie producers.

The policy changes, discussed in Part III of this report, are likely to increase the viability of the Canadian rail transportation and handling system. Inland cleaning could remove one constraint of several currently limiting shipping Canadian grain through the U.S. grain handling system.

However, it seems unlikely that these efficiency improvements, with associated cost decreases, will fully offset the large increase in transportation costs that Canadian grain producers have just experienced. This means that the increased economic incentive for some Canadian producers to ship to the U.S. market, compared to offshore markets, is likely to remain even if efficiency increases over time.

Box 1. How the Canadian Wheat Board “Buy Back” System Works

Example of Durum Wheat, Winnipeg Location, January 1995 (in CA\$)

Producer Opportunity Cost		Buy-Back	
Initial Payment (TB)	\$160.00		
At Winnipeg	\$140.00	Producer Pays	\$165.00
Final Payment	\$ 67.00	Trucking (estimate)	\$20.00
(Forecast from PRO)			
Total	\$207.00	Producer Direct Costs	\$185.00
(At Winnipeg)		Producer Sells	\$329.00*
		Margin	\$144.00
		Final Payment	\$ 67.00
		Total	\$211.00**

* Assumed U.S. price \$6.50 @ 1.38 exchange rate.

**The \$4 gain is highly sensitive to exchange rate, trucking cost and producer selling price.

The producer brings grain to the elevator and, if under 1,000 tons, the buy back price applies. The producer compares the guaranteed return—his opportunity cost from the initial and estimated final payment—with what he can earn from a sale directly into the U.S. market. His expenses—buying the grain back at \$165 and trucking it for \$20, total \$185. His revenue is \$329 from the U.S. buyer and \$67 as his share of the pool’s final payment. In this case, returns from selling to the Board or to the U.S. are extremely close. To be more profitable than selling to the pool, the producer must capture a higher price in the U.S., or have lower transportation costs, than estimated by the Board.

Source: Loyns, R.M.A. and Maurice Kraut. (1995). “Pricing to Value in the Canadian Grains Industry.” Canada-United States Joint commission on Grains, Final Report, Volume II, pg. 33.

Box 2. The Impact of the Export Enhancement Program on U.S. Imports of Canadian Grain

The Export Enhancement Program (EEP) is an export subsidy program that was begun in 1985 with the goal of countering export subsidies for wheat used by the European Union. In this program subsidies are given to companies exporting grain in order to lower the cost for selected importers. The EEP has been used extensively since 1985. However, it has not been used since July 1995 due to high world prices in the grains market.

Many market observers and academics have argued that the Export Enhancement Program (EEP) created a wedge between U.S. and world wheat prices, and that high U.S. prices were partly responsible for the surge in Canadian grain imports. The underlying idea is that an export subsidy program will increase demand for U.S. wheat in the world market. This will increase the price in the U.S. grains market, which will increase supply of wheat by U.S. producers and reduce the demand by U.S. consumers. Imports from Canada occurred partially due to the fact that U.S. prices were somewhat higher than world prices, while no significant import barriers limited the flow of Canadian wheat.*

This is a characterization of the EEP after 1991 when the number of countries receiving export subsidies increased and cash subsidies were given instead of in kind subsidies. Before that year, the EEP gave in kind subsidies, meaning that stocks were used to provide the subsidy to a relatively few targeted importers. Gray and Gardner²⁸ argue that the release of stocks in this fashion was likely to decrease prices in the U.S. as well as the countries importing wheat. However, beginning in 1992, the EEP was operated more like a simple cash subsidy and the number of importers receiving the subsidy increased. It is also important that other exporters sold wheat on the same terms as the United States through the EEP. Gray and Gardner conclude that after 1990 the EEP did play a role in U.S. imports of Canadian grain.

They state, "On the other hand, price relationships for spring wheat other than durum suggest that the EEP did increase the U.S. relative to the Canadian market price."²⁹

They estimate that the EEP might be responsible for around 50 percent of the exports after 1991. However, they state that further econometric work is necessary to be confident of the magnitude of impact of the EEP.

Wilson and Johnson³⁰ use a spatial model of U.S. and Canadian barley trade to analyze the impact of the EEP on imports of Canadian barley. Their results indicate that imports of barley from Canada increase with the size of the bonus given under the EEP program. For example, imports increase from 0.52 to 1.50 million metric tons with the introduction of a \$40/ton export subsidy for the U.S., and imports increase further to 1.78 million metric tons when the subsidy is raised to \$60/ton.

* Gray and Gardener, Wilson and Johnson

Appendix One

Schedule of Grains and Grain Products that were Eligible for WGTA Support

Schedule 1 (Sections 2 and 64) Grains, Crops and Products

Alfalfa Meal, Pellets or Cubes, dehydrated	Meal, Rapeseed or Canola
Barley	Meal, Oil Cake, Linseed
Barley, Crushed	Meal, Oil Cake, Rapeseed or Canola
Barley, Pearl	Meal, Oil Cake, Sunflower Seed
Barley, Pot	Meal, Rye
Barley Sprouts	Meal, Wheat
Beans (except soybeans) including faba beans, splits and screenings	Middlings
Beans (excepts soybean) derivatives (flour, protein, isolates, fibre)	Millfeed
Bran	Mustard Seed
Breakfast Foods or Cereals (uncooked) in bags, barrels or cases. Manufactured from commodities only as listed in this Schedule.	Oats
Buckwheat	Oats, Crushed
Canary Seed	Oats, Rolled
Corn, Cracked	Oil Cake, Linseed
Corn (not popcorn)	Oil Cake, Rapeseed or Canola
Feed, Animal or Poultry (not medicated or condimental), containing not more than 35 percent of ingredients other than commodities as specified in this Schedule, in bags or barrels or in bulk.	Oil Cake, Sunflower Seed
Flaxseed	Peas, including splits and screening
Flour, made from grain or malt in bags or barrels or in bulk	Pea derivatives (flour, protein, isolates, fibre)
Grain, Feed, in sacks	Rapeseed or Canola
Groats	Rye
Hulls, Oat	Screenings or Screenings pellets (applicable only on Screenings from grains specified herein)
Lentils, including splits and screenings	Seed Grain in Sacks
Malt (made from grain only)	Shorts
Meal, Barley	Sunflower Seed
Meal, Linseed	Triticale
Meal, Oat	Wheat
	Wheat Germ
	Wheat, Rolled

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