

Border Disputes in North American Barley Trade: Impacts of Major Agricultural Policies

D. Demcey Johnson
Assistant Professor
Department of Agricultural Economics

William W. Wilson
Professor
Department of Agricultural Economics

Barley trade between the U.S. and Canada has traditionally been negligible. However, recent changes in the policy, institutional and competitive environment have resulted in increased trade and a rise in trade tensions. In fact, Canadian exports of grain to the United States have become a major source of bilateral trade friction. While interest has centered on wheat, the U.S. barley market has also been affected by imports from Canada. U.S. producers have demanded protection under Section 22 of the Agricultural Adjustment Act, pointing to Canadian rail subsidies and Wheat Board pricing practices as causes of surging barley imports. Institutional and policy factors appear to hold potential for further, drastic changes in competitive relationships and spatial flows.

The North American barley market presents some interesting policy contradictions. In the United States, barley supplies have been managed through acreage controls, while exports have been subsidized through the Export Enhancement Program (EEP). These policies are intended, in part, to support market prices and reduce costs of deficiency payments. However, the price disparity between U.S. and subsidized offshore markets resulting from this program has encouraged an influx of Canadian grain, particularly in the more open trading environment that emerged in the period following the Canadian-U.S. Free Trade Agreement (CUSTA).

Canada's agricultural policies and grain marketing institutions differ drastically from those in the U.S. The

Canadian Wheat Board (CWB) has a monopoly on barley pro-curement for uses other than domestic feed. This facilitates strategic behavior by the CWB, i.e., its ability to target markets and practice price discrimination. Canada does not have explicit acreage controls. The government provides an important indirect subsidy to producers through the Western Grain Transportation Act (WGTA): railroads are subsidized for grain movements to Vancouver and Thunder Bay, reducing producers' cost of barley shipments to offshore markets and the eastern United States. Under terms of the CUSTA, WGTA subsidies do not apply to shipments to Western states. Grain handling costs are high relative to those in the United States, creating incentives to circumvent Canadian elevators through cross-border truck shipments to U.S. elevators for shipment beyond.

Opportunities for North American barley trade have inspired much debate in Canada. A major liberalization of barley marketing in Canada was implemented in August 1993. The move toward a "Continental Barley Market" allowed Canadian producers or traders to sell directly to U.S. buyers, bypassing the CWB (which retained control over offshore sales). This was reversed through a September 1993 court decision, after an estimated .5 to 1 million metric tons of Canadian barley had been contracted for sale to U.S. buyers.

In addressing effects of policy changes, numerous complexities have to be recognized. First, the North American barley market is comprised of many

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distinct regional markets. Prices are connected spatially through transport and handling costs, but also reflect impacts of trade policies (i.e., U.S. tariffs and export subsidies, and Canadian export permits). Second, quality factors are an important determinant of regional flows, especially concerning malting barley. Third, there is little published information or data on feed barley demand at state or province level. Feed demand ultimately depends on the size and composition of livestock herds and on prices of substitute feed-stuffs, which vary drastically by region.

This article summarizes results of an analysis of the effects of selected trade and marketing policies on barley trade flows, prices and price differentials, and economic welfare. There are important policy tradeoffs for the United States, such as whether the U.S. should pursue a policy of increasing exports via EEP, or protecting its domestic market. A mathematical programming model was developed to explain barley trade flows and price relationships, details of which are contained in the full report on this project.

Simulation Results

Base-Case: Continental Barley Market

Our base-case assumptions reflect a freer marketing regime in Canada. Specifically, we assume: 1) quantitative restrictions do not apply to cross-border flows of barley or malt; 2) Canada does not regulate imports through the granting of permits; 3) current U.S. tariffs apply to imports of barley and malt from Canada; 4) Canadian rail rates reflect current Crow subsidies; and 5) cross-border truck/rail shipments are allowed to U.S. barley destinations.

Under these conditions, the model projects 3.5 mmt of Canadian barley exports to the United States, including 2.8 mmt of feed barley (Table 1). This is substantially larger than historic trade levels, and much larger than estimates of other studies. In large measure, this is due to the highly elastic (and high-priced) U.S. regional demand schedules. It also reflects the diverse set of transportation

alternatives (including prairie-border-crossing flows) incorporated in the model, which previous studies have largely ignored.

Canada's domestic feed use (2.9 mmt) is projected to be smaller than levels observed in recent years, implying substantial substitution in Canadian demand. Canada also exports nearly .7 mmt of malting barley to the United States. Two-row malting barley accounts for over 90 percent of these malting barley exports. Average producer prices are substantially higher in the United States than in Canada. U.S. producer prices are \$1.81/bushel (averaged over all U.S. producing regions and barley types), while Canadian producer prices are \$1.47/bushel. Among other factors, this difference reflects the proximity of U.S. producing regions to high-priced feed markets and malting capacity.

Results confirm the importance of West Coast feed markets. California, Arizona and Nevada represent the highest-priced feed barley markets due to transportation costs and expensive feed substitutes. U.S. prices are lowest in midwestern barley-producing states. Prices in the prairie provinces are the lowest of all regions. This is consistent with actual relationships observed during the spring of 1993, the period used for estimation of regional demand schedules.

California represents the largest feed demand region, with barley feed use of 2.4 mmt. Most of California's feed barley demand is satisfied by exports from Canada. The northwestern states (Oregon, Washington and Idaho), which account for an additional 1.9 mmt of feed barley demand, are also supplied extensively by Canada. In total, Canada captures 43 percent of the U.S. feed barley market. Canadian exports of malting barley to the U.S. West Coast are particularly large. The U.S. Midwest, where most U.S. malting capacity is located, is principally served by U.S. producing regions. Canada's share of the U.S. malting barley market is 24 percent in the base case.

Regional flows provide an interesting perspective on the U.S. EEP program. Under base-case assumptions, subsidized

Table 1. Base-case simulation results.

	U.S.	Canada
Bilateral trade flows (TMT)		
Exports		
Feed barley	0	2,878
Malting barley	134	682
Malt	0	156
Net bilateral trade ^a		
Feed barley	-2,878	2,878
Malting barley	-548	548
Malt	-156	156
Offshore feed exports (TMT)		
Subsidized markets	1,973	0
Nonsubsidized markets	0	2,971
Domestic use (TMT)		
Feed use	6,691	2,909
Malting use	2,842	857
Avg. producer price (U.S. \$/bu)		
	1.81	1.47

^a Defined as exports less imports.

U.S. export shipments originate largely in western Montana, Washington, Oregon, and Idaho. Feed markets in each of these states receive substantial inflows of barley from adjoining regions, particularly southern Alberta. This highlights the fungible aspect of barley supplies. The model does not allow Canadian barley to qualify for U.S. export subsidies; however, grain exported under EEP can be replaced in U.S. markets by imports from Canada.

U.S. Import Restrictions

Under terms of the Canadian-U.S. Free Trade Agreement, the United States retains its rights under Section 22 of the Agricultural Adjustment Act. Specifically, Section 22 allows the Secretary of Agriculture to restrict imports if they adversely affect domestic farm program operations. Technically, either an *ad valorem* import duty of 50 percent or import quotas (not to exceed 50 percent of a representative movement) could be imposed, either through an emergency action or following study by the U.S. International Trade Commission. In early 1994, the United States threatened to invoke Section 22 to curtail imports of Canadian wheat. Similar action was urged by U.S. barley producers in

response to a surge of imports from Canada.

To evaluate potential implications of U.S. trade restrictions, we introduce import quotas on barley in the base-case model (see Table 2). With zero barley imports from Canada, the average price received by U.S. producers is \$1.89/bu — about 8 cents higher than in the base case. For Canadian producers, the average price is US \$1.27/bu — 20 cents lower than in the base case. Thus, elimination of U.S. barley imports would widen the cross-border gap in average producer prices by 28 cents per bushel.

With zero Canadian barley allowed into the United States, Canada's domestic feed use is 5.3 million mt and U.S. feed use is 4.3 million mt. As the U.S. import quota is increased, there are corresponding changes in domestic feed use and offshore exports. For the first 1.5 million mt of U.S. imports, Canada shifts its exports away from offshore markets and to the U.S., while U.S. exports to offshore (EEP) markets increase in step with imports from Canada.

Compensatory Rail Rates

The Canadian government recently proposed changes in the method of payment for the Crow Benefit. Existing subsidies, paid by the government to the railroads, would be converted into direct payments to producers over the course of four years. For purposes of model simulations, rates for applicable Canadian rail movements are adjusted by the full

amount of the Crow Benefit. With fully compensatory rates, shippers pay the total cost of shipping, including the portion previously paid by the Canadian Government. This raises the shipping rate to Vancouver (for export) and Thunder Bay (for eastern destinations). These higher rail rates make prairie-border-crossing movements more attractive.

Results indicate that compensatory rates widen the gap between U.S. and Canadian producer prices. Canadian exports to offshore markets are reduced (relative to the base case) because of higher shipping costs to Vancouver. With unrestricted access to the U.S. market, Canada exports over 5 million mt of barley to the United States — about half of total Canadian production. Thus, elimination of Canadian rail subsidies will not advance U.S. producer interests. To the contrary, as higher shipper costs depress barley prices in Canadian producing regions, the effect is to induce larger flows of Canadian barley into the United States.

The Export Enhancement Program

The Export Enhancement Program has an important influence on North American barley flows. U.S. export subsidies depress world prices and increase U.S. prices, thereby enhancing the attractiveness of U.S. markets relative to Canada's alternatives. From a Canadian perspective, EEP has been one of the most significant causes of ongoing

bilateral disputes over grain trade.

To quantify these effects, the model was simulated with alternative levels of the EEP bonus (subsidy per metric ton). As expected, a higher EEP bonus raises average U.S. producer prices. The United States does not export significant quantities of barley until the EEP bonus rises above \$20/mt; thereafter, U.S. exports increase and domestic prices rise, inducing larger imports from Canada. The United States remains a net importer of barley at all bonus levels considered (from \$0 to \$60/mt). This suggests that even if EEP were eliminated, there are substantial economic inducements for Canadian sales into the U.S. market.

Restoration of CRP Acres to U.S. Production

The Conservation Reserve Program contributed to the loss of U.S. barley acres during the mid-1980s. To evaluate the significance of this program, simulations were conducted in which CRP acres were restored to barley production in four major producing states: Montana, North Dakota, Minnesota and South Dakota. This leads to a 19 percent gain in U.S. barley output relative to the base case.

Results suggest that U.S. barley imports from Canada would be reduced by only 7 percent, because the rise in U.S. supply is accompanied by a large increase in domestic feed use. While the return of CRP acres to production would have little impact on aggregate trade flows, average producer prices would fall in both

Table 2. Results from alternative simulations.

Variable	Base Case	U.S. Import Quota		Compensatory Rail Rates	U.S. EEP Bonus			Return of CRP Acres
		0 mmt	1 mmt		0	40	60	
					(\$/mt)			
Canadian barley exports (mmt)	6.73	4.24	4.44	7.42	6.86	6.85	7.33	6.52
to United States	3.56	0	1.00	5.02	2.60	3.69	4.26	3.32
to offshore markets	3.17	4.24	3.44	2.39	4.25	3.15	3.07	3.20
U.S. offshore exports (mmt)	2.02	1.02	1.82	2.12	0.05	2.49	3.74	2.21
Domestic Feed Use (mmt)								
Canada	2.91	5.27	5.07	2.25	2.78	2.81	2.32	3.13
United States	6.69	4.27	4.46	7.99	7.71	6.34	5.66	7.78
Average Producer Prices								
Canada (US \$/bu)	1.47	1.27	1.32	1.43	1.47	1.48	1.51	1.45
United States (US \$/bu)	1.81	1.89	1.88	1.79	1.75	1.84	1.89	1.75

countries. U.S. producer revenue would rise by 14 percent due to the increased barley output.

Summary and Discussion

Barley trade between the United States and Canada has traditionally been negligible. However, recent changes in the institutional and policy environment have resulted in increased trade, as well as increased tensions within and between these countries. Some of these hold potential for further, drastic changes in competitive relationships and spatial flows.

A mathematical programming model was developed to analyze North American barley flows and impacts of policies on trade flows, prices and welfare. The model was used to identify optimal trade flows and corresponding prices under a freer trade regime, similar to that which would have evolved under the "Continental Barley" proposal: unrestrictive bilateral trade in barley and malt, import duties imposed by the United States, subsidized rail rates in Canada, and average EEP bonuses for U.S. export sales.

Results indicate that with a liberalized marketing regime in Canada, the United States would import about 3.5 mmt of Canadian barley. This includes over 2.8 mmt of feed barley, which is sold in western U.S. feed markets. U.S. import quotas would reduce imports from the base-case solution, by definition. If imports were eliminated, the price spread between US and Canada would increase from 27c/b in a free trade solution to 62c/b.

One of the more important policies affecting prairie-border-crossing barley flows is the rail subsidy regime currently used in Canada. Increasing Canadian rail rates depresses Canadian prairie barley prices, so that prairie-border-crossing shipments become the optimal movement for a significant portion of Canadian barley. Results indicate that the equilibrium quantity of barley exported from Canada to the U.S. increases by 1.5 mmt under this scenario.

Increases in EEP bonuses raise the U.S. domestic price relative to the international market. In response, U.S. barley imports from Canada increase. With higher subsidy levels, gains in U.S. producer revenue from export sales are partly offset by losses in revenue from the domestic market. Canadian producer revenue drops sharply with EEP bonuses above \$25/mt and restricted access to the U.S. export market. However, with unrestricted access to the U.S. market, Canadian revenue increases with a rise in the EEP bonus level; this is due to being able to sell in the higher priced U.S. market, replacing the U.S. barley that is exported under subsidy.

Policy Discussion

Numerous pressures are now being exerted on the North American barley market. Ultimately, these stem from policies and marketing institutions that have evolved independently in the United States and Canada. In combination, these factors have led to price distortions within North America, increased imports of Canadian barley into the United States, and pressures to make drastic alterations in the Canadian marketing system.

In each country, existing policies and institutions are challenged by the evolution of a more open trading environment for barley and malt. Results of this study are important to the policy debates regarding North American barley trade. First, given the geographical distribution of demand and supply, relative demand elasticities and transport and handling costs, economic pressures exist for increased movement of Canadian barley to the United States. This volume is much greater than estimated in previous studies (which maintained fairly restrictive assumptions). A positive level of imports would exist even in absence of the EEP program. However, the equilibrium import level increases in response to: EEP bonuses; reductions in U.S. planted acreage due to CRP or other programs; and elimination of direct payment of the WGTA subsidy to Canadian railroads.

Second, the Export Enhancement Program was conceived in an era when

barley imports from Canada were negligible. However, under freer trade and absent any mechanism for bilateral policy coordination, this program results in increased imports from Canada and reduced U.S. producer revenue from domestic sales. Increased EEP bonuses expand the volume of U.S. exports; however, the impact on U.S. producer prices is mitigated by increased imports of Canadian barley. This confronts the United States with a strategic choice: whether to pursue a policy of increasing exports via EEP, or protect the U.S. domestic market.

Third, the Crow rate subsidy mechanism has been controversial in Canada, and a focus of ongoing trade disputes. Allegations are made that this subsidy provides an unfair trade advantage to Canada and is one reason for the increased volume of trade. However, these results demonstrate that elimination of this subsidy (by paying growers directly) results in an increased flow of Canadian barley to the United States. This is due to the relative costs of alternative logistical channels and opportunities for spatial arbitrage, which were not considered under previous marketing arrangements.

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