



Barley Industry Profile

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Production and Use

Barley is the third largest feed grain crop produced in the United States, after corn and sorghum. Barley is a short-season, early maturing crop. Therefore, it is produced in a variety of climates and in both irrigated and dryland production areas. Production is concentrated in the Northern Plains and the Pacific Northwest. The United States is the eighth largest producer of barley in the world with current production estimated at 4.9 million planted acres.

Barley is classified as either six-row or two-row, depending on the physical arrangement of the kernels on the plant. Barley is also described as hulled or hull-less by the presence of beards or awns covering the kernels. Six-row barley is grown primarily in North Dakota, Minnesota, South Dakota, and Idaho. Two-row barley is grown in Montana, Idaho, Colorado, Wyoming, Washington, Oregon, and California. North Dakota, Idaho, and Montana are the three largest barley producing states (Exhibit 1).

Barley is used as livestock feed, food, and barley malt. Each of these uses is best met with specific barley varieties. Currently, 60 percent of the barley grown in the United States is used in food and industrial uses, while 40 percent is used for feed. Barley competes with corn and sorghum as a feed grain. It has higher protein content than corn which reduces the need for protein supplements in feed compounds. Barley grown for human consumption is used in soups, as an extender for vegetable proteins and is occasionally milled into flour. Barley flour is used in the United States in baby food and in North Africa and Asia for flatbreads or porridges.

Exhibit 1. U.S. Barley Production, 2000 to 2002 (Thousand Bushels)			
	2000	2001	2002
North Dakota	97,350	79,750	57,040

Idaho	55,480	50,250	53,960
Montana	38,000	29,520	39,900
Washington	34,300	21,000	18,360
Colorado	12,075	8,560	7,200
Minnesota	15,360	7,975	6,435
Wyoming	7,885	6,970	4,900
California	6,460	5,830	5,100
Oregon	8,400	4,500	3,700
South Dakota	5,775	4,056	1,845
Other	37,643	31,009	37,443
Total US	318,728	249,420	226,873

Source: USDA/NASS

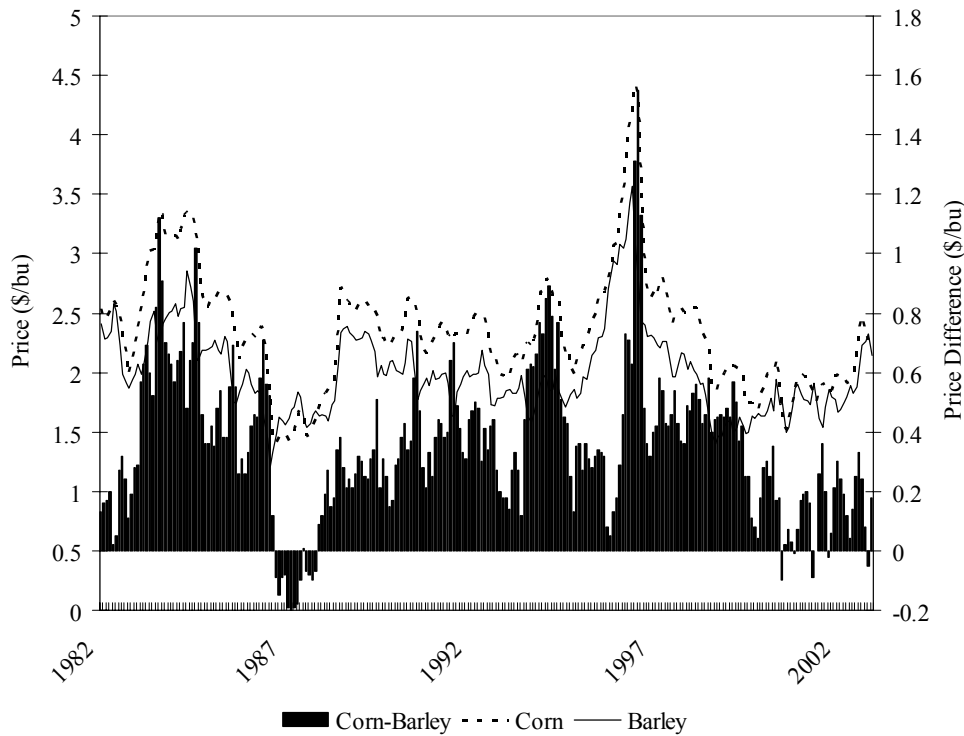
Barley production in the Northern Plains is susceptible to damage from fusarium head blight, a fungal disease that can be found in all small grain crops. It commonly occurs in North Dakota on spring wheat, durum, and barley. The disease causes yield loss and light-test weight kernels. It is also associated with fungal toxins (mycotoxins) that are hazardous to animals. In addition, vomitoxin in malting barley creates problems in the production of beer. Only minimal levels of vomitoxin are allowed in malting barley. Infected grain is severely discounted in the market.

Barley diseases are managed through several different approaches. Currently, research is being conducted to develop disease-resistant grain varieties. Crop rotation, seed treatment, and fungicides are also being used to protect barley crops. Cropping practices can also reduce the spread of fusarium head blight. The fungus survives best on residue left on or above the soil surface. Therefore, tillage practices that bury harvest residue reduce the inoculum potential of the fungus. No-till farming (leaving residue on the field) is a common practice in the upper Midwest and is probably contributing to the persistent presence of fusarium head blight in the region.

Feed Barley Prices

Between 1982 and 2002, the average monthly price of feed barley in the United States was 86 percent of the average monthly corn price. From 1982 through 1986, feed barley prices averaged 84 percent of corn prices. Likewise, from 1998 through 2002, sorghum prices averaged 88 percent of corn prices. Exhibit 2 illustrates the monthly U.S. corn and feed barley prices as well as the price difference between the two crops from 1982 through 2002. Since the crops are close substitutes, their prices are highly correlated with each other. The average price difference over the time period was a 35-cent per bushel premium on corn.

Exhibit 2. U.S. Corn and Feed Barley Prices, 1982-2002.



Production Contracts

Contracts for malt barley production offer maltsters a secure supply of high-quality barley and price premiums for farmers to grow malt barley over higher-yielding feed barley. Malt barley that does not meet quality specifications for malting is sold in the feed market at significant price discounts relative to feed barley because of lower test weights and protein.

Malting companies contract for both two-row and six-row barley varieties. Some contracts are specific to a certain variety as well as quality requirements. The preference for two-row or six-row barley stems from several factors including quality, brewing techniques, price, and style or flavor of the finished product (beer). The two classes differ by kernel size, extract, protein, and enzyme levels. While two-row barley yields malts with 1 to 2 percent greater extract, this must be balanced by higher costs and lower diastatic power of two-row malt.

Most contracts have very specific quality requirements for acceptable malt barley. Characteristics include protein, moisture, and foreign material levels, skinned and broken kernel limitations, sprout damage, color and plumpness of kernel. There are also stringent tests for the presence of diseases such as fusarium head blight. Most of the characteristics directly affect the brewing process, making contract specifications necessary for high quality beer production.

The price of malt barley is largely determined by the supply of malt in both the domestic and world markets and demand for malt and malt products. The high prices of malt barley relative to feed barley result in malt barely production that often exceeds demand. This allows maltsters to select the highest quality of malt. Environmental factors can significantly affect crop production

and quality. The damage to barley crops of fusarium head blight in the upper Midwest negatively impacted the price of six-row barley and eventually caused malt prices to rise.

Malt Barley Prices

Exhibit 3 compares malt barley prices to those of feed barley. In the early 1980s, prices were similar. In recent years, they have diverged. The average difference between malt and feed barley prices from 1982 to 1986 was 13 cents per bushel. During that time period, feed barley prices were, on average, 95 percent of malt barley prices. From 1998 to 2002, the average price difference between the grains was 76 cents per bushel with malt barley carrying a 70 percent premium.

The yearly average price received for malt barley has increased 13 percent over the last 20 years and 45 percent from its low in 1986 (Exhibit 3). Barley prices rose from 1993 to 1996 due to a prevalence of fusarium head blight in the upper Midwest during that period.

World Trade

Barley is one of the most highly adapted of the cereal grains, with production in climates ranging from sub-Arctic to sub-tropical. Barley is grown on a large scale in Russia, Australia, Germany, Turkey, and North America. The leading exporters of barley are the European Union, Australia, and Canada.

Because of its use in malt beverages, barley is grown in many areas of the world as much for cultural as economic reasons. Europe has long been a producer of malt barley. The use of subsidies to encourage production has resulted in the European Union competing with Canada as the largest exporter. U.S. exports and market share have dropped substantially since the 1980s. Saudi Arabia, Japan, and China are the largest importers of barley. Barley exported to Saudi Arabia is used for livestock feed, while Japan imports barley for feed and malt production. A growing percentage of the world trade is in the form of malt.

The implementation of the Canadian/United States Trade Agreement (CUSTA), and later the North American Free Trade Agreement (NAFTA), created one market for malt barley in the United States and Canada. Import restrictions were reduced and the Canadian Wheat Board adopted a pricing policy of selling to Canadian maltsters at the Minneapolis cash price less transportation costs. This eliminated price protection for Canadian maltsters. NAFTA eliminated Canadian tariffs on malt barley and malt by 1996 and 1998, respectively. The United States and Canada continue to compete with the European Union's export support programs for malt barley and malt.

Exhibit 3. Malt Barley and Feed Barley Prices, 1982-2002.

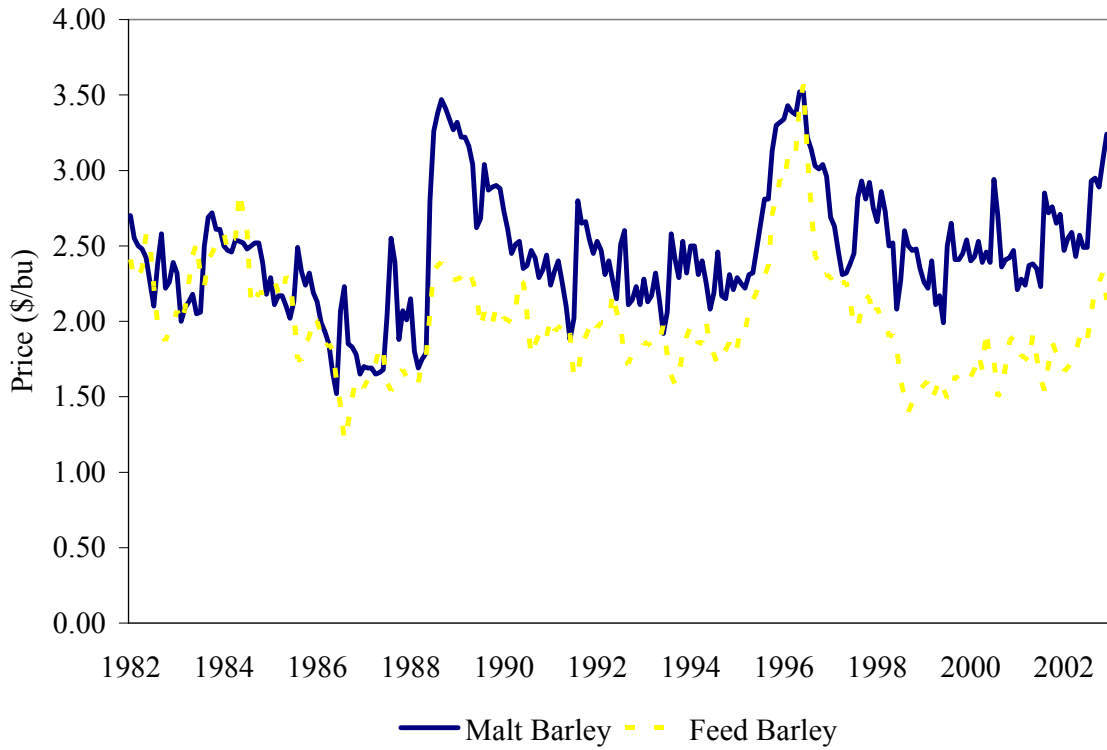
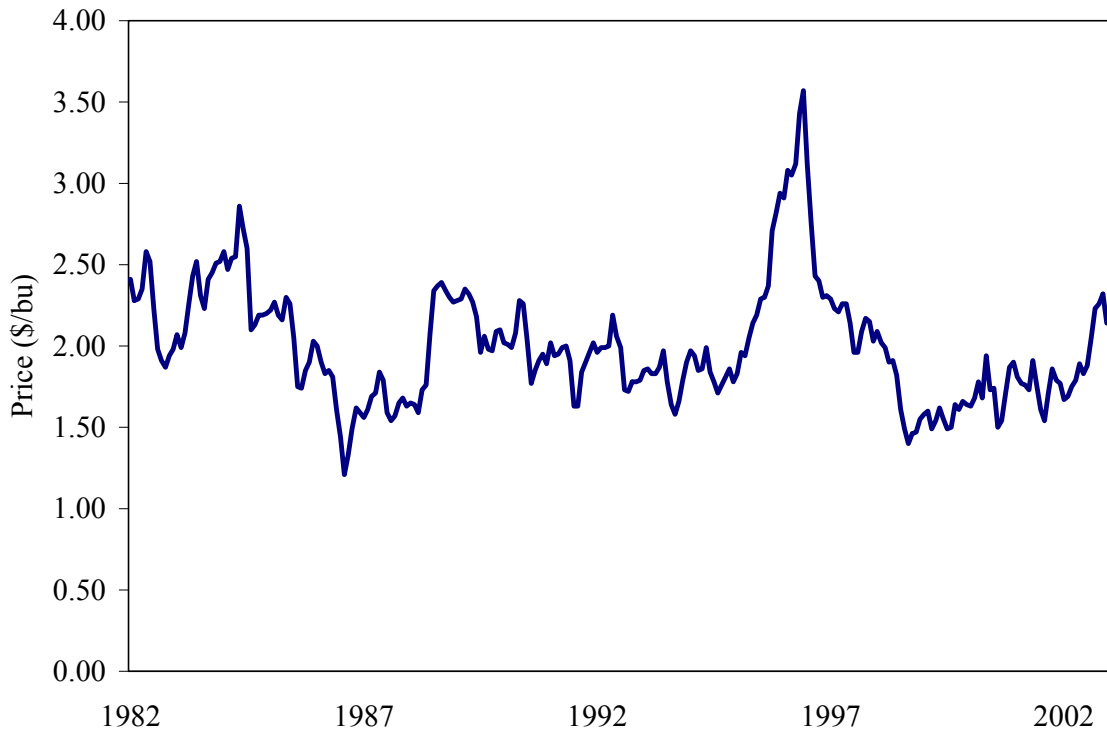


Exhibit 4. Malt Barley Price, 1982-2002.



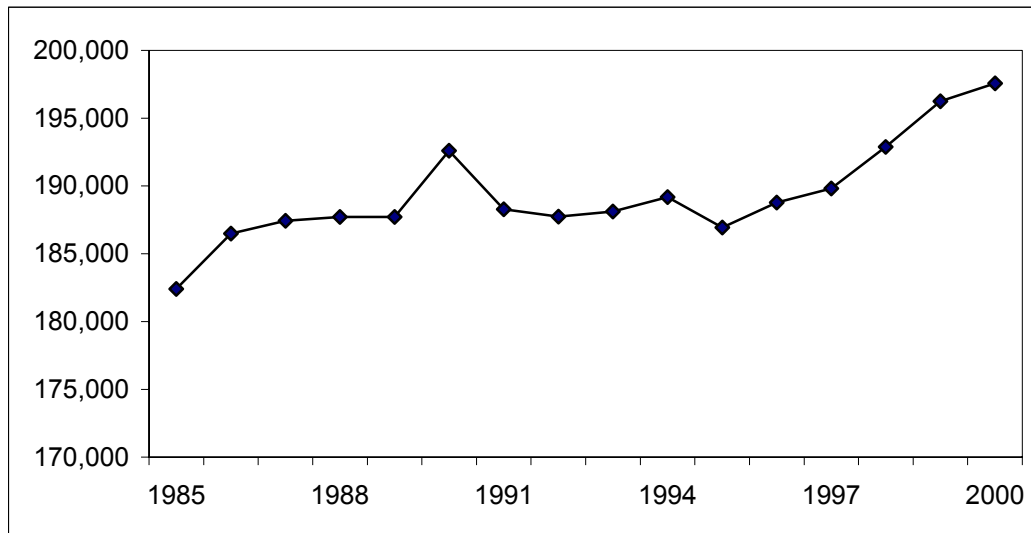
The European Union is the world's largest producer and exporter of barley primarily because agricultural policy instruments encourage barley exports. Export restitution payments are used to compensate producers for the price difference between the (higher) domestic price and the (lower) price received for export sales. The payments act as an export subsidy for barley shipments from the European Union. This program was implemented several years before the creation of the EEP in the United States, encouraging the European Union's transition from a net importer to a net exporter of barley.

Brewing Industry

Beer is considered a mature product, so growth occurs at a slow rate relative to newer industries. The industry measures beer consumption using beer shipments as a proxy. Recent growth in beer consumption is attributed to the increase in the population of adults over the age of 21. The decline in beer sales in the first half of the 1990s was due primarily to an increase in federal excise taxes (Exhibit 5). Despite the overall increase in beer shipments, per capita consumption has actually decreased since the early 1980s. (See Exhibit 6) This may be an indication of the effectiveness of public policy and private sector initiatives encouraging moderation and personal responsibility regarding alcohol consumption.

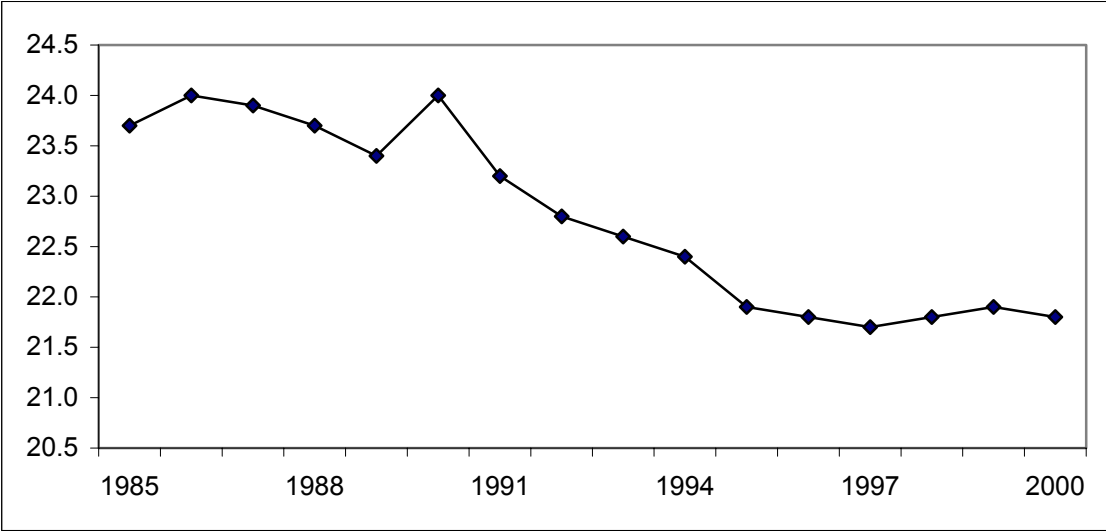
Increased consumer demand for microbrews has increased the number of small breweries in the United States to more than 1,800 or seven times the number in business in 1990. Imports have grown consistently over the past decade. American brewers are increasing foreign shipments through licensing agreements and joint ventures with foreign brewers.

Exhibit 5. U.S. Beer Shipments, 1985 to 2000 (thousands of barrels).



Source: Beer Institute

Exhibit 6. Per Capita Consumption of Malt Beverages, 1985 to 2000.



Source: Beer Institute