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BARLEY PRODUCTION AND MARKETING IN THE UNITED STATES AND CANADA

by

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FOREWORD

This report is a description of the marketing system for barley in the United States and Canada. It was written for the American Agronomy Association and will be published as a chapter in a monograph on barley. Parts of that chapter are published in this report for limited distribution.

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Introduction

Barley production traditionally has been important in both the United States and Canada. Normally, barley accounts for about 3 percent of total U.S. grain production. Barley production in Canada accounts for between 25 and 30 percent of the land devoted to grain production and is second only to wheat. The amount of barley produced in North America, however, is small relative to world production. Western Europe, the largest barley producing region, accounts for about 34 percent of world production and is followed by the Soviet Union with about 29 percent. North American production is normally about 11 percent of world production.

Barley has two principal commercial uses. One is for feed grain for livestock and the other is for malting. There are many substitutes for barley as feed but few in the case of malting. The marketing system for barley includes the system of price formulation, transportation, grading, and other physical and institutional factors. The purpose of this report is to describe the production and marketing system for barley in North America. The first section presents trends in supply and demand. Factors affecting producers' decisions to plant barley are discussed in the second section. Distributional factors affecting marketing and price formulation are presented in the third section. The grading and transportation systems in each country as they affect barley marketing are discussed in the fourth section. The final section is a brief description of the barley-using industries.

Barley Supply and Demand

United States

Barley production varies through time and responds to prices and costs of other crops. Barley production in the United States is concentrated in the Northwest, extending from Minnesota to the West Coast. Hectares planted to barley in each of the 10 largest barley producing states are shown in Table 1. The data indicate that North Dakota leads all other states in hectares devoted to barley production followed by Montana, California, and Minnesota. In most states, with the exception of Idaho, Wyoming, and more recently Washington, the hectares planted to barley have decreased since 1955. In any particular year, yields vary from state to state depending on weather and growing conditions. Generally, yields have been increasing since 1955 and in many cases have doubled. Total barley production for each of these 10 states and the United States is shown in Table 2. Total U.S. production, which has fluctuated markedly over the past 28 years, has averaged 8.6 million tonnes.

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TABLE 1. HECTARES PLANTED TO BARLEY FOR THE TEN LARGEST BARLEY PRODUCING STATES (1955-1982)

Year	California	Colorado	Idaho	Minnesota	Montana	North Dakota	Oregon	South Dakota	Washington	Wyoming	United States
	(000 hectares)										
1955	811	223	259	492	568	1,518	248	217	313	52	6,610
1956	819	214	208	408	471	1,335	250	248	266	48	6,003
1957	868	272	237	373	730	1,509	263	223	322	49	6,691
1958	842	226	235	351	679	1,645	250	216	293	47	6,600
1959	825	237	226	409	788	1,662	242	255	293	51	6,876
1960	746	251	243	363	728	1,460	208	212	277	46	6,318
1961	724	239	250	377	728	1,474	210	227	293	50	6,383
1962	651	277	273	324	772	1,238	188	179	267	52	5,923
1963	651	252	259	298	664	1,375	194	148	280	53	5,612
1964	626	212	244	250	658	1,113	186	101	221	50	4,892
1965	632	134	208	243	552	1,017	177	89	136	55	4,087
1966	600	141	231	269	702	1,210	182	128	167	49	4,505
1967	654	112	219	307	533	1,113	120	132	95	44	4,047
1968	634	118	217	409	485	1,091	135	205	110	47	4,240
1969	526	137	241	282	679	916	179	149	159	53	4,172
1970	511	132	298	245	728	807	178	157	176	56	4,245
1971	475	146	307	346	704	924	158	200	203	59	4,498
1972	451	117	301	326	736	1,090	113	246	110	59	4,305
1973	433	116	337	365	849	1,157	109	271	153	59	4,544
1974	412	101	291	325	566	853	87	226	131	59	3,639
1975	493	99	313	304	550	898	80	226	169	59	3,859
1976	485	111	327	356	493	890	72	234	161	59	3,705
1977	465	113	404	445	627	1,088	84	275	169	60	4,298
1978	445	113	384	433	607	1,011	80	242	161	58	4,041
1979	364	119	388	315	445	687	72	226	133	62	3,282
1980	323	107	364	364	477	748	68	216	178	58	3,352
1981	307	127	445	424	566	942	84	234	283	58	3,910
1982	283	99	457	364	667	841	89	226	343	54	3,901

SOURCE: USDA Agricultural Statistics.

TABLE 2. TOTAL BARLEY PRODUCTION FOR THE TEN LARGEST BARLEY PRODUCING STATES (1955-1982)

Year	California	Colorado	Idaho	Minnesota	Montana	North Dakota	Oregon	South Dakota	Washington	Wyoming	United States
	(000 tonnes)										
1955	1,500	180	426	626	884	1,778	389	200	401	67	8,735
1956	1,480	173	355	615	647	1,631	465	146	483	58	8,205
1957	1,713	396	439	445	992	1,675	476	264	697	90	9,518
1958	1,469	297	430	674	1,137	2,388	433	340	482	92	10,345
1959	1,491	334	368	618	1,128	1,654	421	129	589	75	9,189
1960	1,588	391	360	650	871	1,843	358	325	525	66	9,390
1961	1,607	365	416	594	574	987	363	257	621	74	8,614
1962	1,622	295	578	407	1,196	2,262	385	240	621	90	9,502
1963	1,480	199	622	563	972	2,272	362	193	592	89	8,830
1964	1,595	197	591	427	1,098	1,980	355	127	487	87	8,771
1965	1,556	235	532	565	1,089	2,128	369	176	322	117	8,540
1966	1,463	233	510	456	1,383	2,009	365	161	416	74	8,560
1967	1,641	250	564	754	806	1,906	188	284	206	98	8,118
1968	1,530	237	530	1,001	930	2,315	227	416	233	110	9,208
1969	1,179	261	661	686	1,478	2,065	373	262	370	128	9,221
1970	1,279	317	899	468	1,418	1,434	395	264	432	137	9,060
1971	1,160	301	902	886	1,280	2,173	394	426	606	149	10,093
1972	1,108	239	865	739	1,393	2,279	261	451	308	153	9,219
1973	1,043	268	946	875	1,306	2,231	205	480	309	135	9,917
1974	992	217	696	643	808	1,159	190	278	303	140	6,621
1975	1,315	265	821	693	1,103	1,737	192	359	461	166	8,358
1976	1,231	293	940	767	1,133	1,770	160	129	458	182	8,109
1977	1,158	295	961	1,199	1,136	2,148	194	585	205	159	9,147
1978	992	334	1,214	1,131	1,227	2,453	201	455	537	179	9,732
1979	1,032	407	1,195	888	883	1,652	181	454	370	189	8,334
1980	961	347	1,283	754	960	1,045	219	302	686	188	7,806
1981	878	411	1,374	1,256	1,235	2,361	255	437	960	178	10,413
1982[a]	837	442	1,619	1,111	1,672	2,176	15	496	1,023	188	11,076

[a]Estimates.

SOURCE: USDA Agricultural Statistics.

Greatest production during the period occurred in 1982 with 11.0 million tonnes and the lowest in 1974 with 6.6 million tonnes.

An important feature in the barley market is the distinction between feed and malting varieties. Data indicating the percentage of barley hectares planted to each variety are available for the ten major malting barley producing states and are presented in Table 3. In recent years over 90 percent of the barley grown in North Dakota was for malting purposes. Over the past seven years the proportion of barley seeded to malting varieties has increased modestly, and in 1981, 93 percent of the barley acres were planted to six-rowed malting varieties. The variety 'Larker,' which has been the industry's quality standard for the past 18 years, has decreased in importance in North Dakota and in other states in recent years and has been replaced by expanded production of 'Morex' and 'Glenn' barley--each having greater yields. About 50 percent of the barley production in Montana is devoted largely to two-rowed malting varieties; barley production in Minnesota is nearly all devoted to malting varieties; barley production in Idaho is dominated by two-rowed varieties. However, an increasing proportion of barley production in Idaho is of feed varieties. Production of barley in California, Oregon, and Washington is nearly all for feed purposes. Malting barley production in these states often is confined to specific local areas and is normally less than 10 percent of total barley production.

Supply and disappearance data for all barley in the United States are presented in Table 4 and in Figure 1. Domestic supply is composed of production, beginning stocks, and imports. Demand is separated into domestic and export uses. Domestic demand is further broken down into two categories: (1) feed and (2) food, alcohol, and seed (nonfeed uses). Generally, there has been a decreasing trend in barley used for feed. In the early 1960s, about 5 million tonnes of barley was used for feed and has since decreased to about 4.0 million tonnes. The largest component of the nonfeed use (food, alcohol, and seed) of barley is for malt, and this category of utilization has increased since the mid-1960s. Generally, a greater proportion of the barley production is being used in the malting industry now than in the past. In recent years nearly 50 percent of the barley supply is used for nonfeed uses, predominantly malt. Exports of barley have been sporadic with no apparent trend. Ending stocks have also been sporadic and peaked during the 1969-1972 period.

Utilization of barley malt by U.S. domestic brewers shows a steady increase since 1959 (Table 5). Utilization of malt per barrel of beer produced is also shown and indicates a general decrease since 1955. However, more recently there has been a slight increase.[1] The amount of malt trade to and from the United States is incidental relative to its overall utilization (Table 6). Average exports and imports over the period were 33,000 tonnes and 32,000 tonnes, respectively. The data illustrate that prior to 1975 United States was a net exporter of malt. Since 1975, however, exports have remained just over 20,000 tonnes while imports have increased.

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[1]Statistical analysis indicated that malt (or beer) consumption has increased an average of 37,351 tonnes per year since 1959. This is a growth rate of just less than 2 percent per year.

TABLE 3. PERCENT OF U.S. BARLEY HECTARES PLANTED BY VARIETY FOR THE TEN STATES WITH GREATEST HECTARAGE (1974-1981)

State and Variety	1974	1975	1976	1977	1978	1979	1980	1981
North Dakota								
Morex[a]	--	--	--	--	0.3	7.6	38.2	35.2
Glenn[a]	--	--	--	--	0.4	8.0	22.5	37.7
Larker[a]	39.7	35.1	35.3	37.9	36.3	36.7	18.7	13.5
Beacon[a]	17.0	30.9	40.3	38.3	37.7	28.2	9.3	3.9
Other Malting[a]	25.6	17.1	10.0	9.5	8.4	4.1	2.2	3.1
Total Malting	82.3	83.1	85.6	85.7	83.1	84.6	90.9	93.4
Total Feed	17.7	16.9	14.4	14.3	16.9	15.4	9.1	6.6
Montana								
Piroline[b]	35.8	25.1	25.1	37.7	31.9	28.7	29.3	30.4
Klages[b]	--	--	2.5	6.1	12.7	13.6	10.4	9.8
Shabet[b]	8.4	8.6	8.5	5.0	4.4	5.1	5.5	4.8
Betzes[b]	6.0	4.7	5.1	2.8	2.8	2.7	--	--
Other Malting	--	--	--	--	--	1.7	2.7	4.6
Total Malting	50.2	38.4	41.2	51.6	51.8	51.8	47.9	49.6
Total Feed	49.8	61.6	58.8	48.4	48.2	48.2	52.1	50.4
Minnesota								
Morex[a]	--	--	--	--	--	35.0	66.0	65.0
Larker[a]	75.0	75.0	67.0	74.0	65.0	43.0	15.0	8.0
Manker[a]	--	--	21.0	18.0	24.0	15.0	10.0	3.0
Glenn[a]	--	--	--	--	--	--	4.0	20.0
Other Malting	15.0	16.0	7.0	3.0	2.0	2.0	1.0	--
Total Malting	90.0	91.0	95.0	95.0	91.0	95.0	96.0	96.0
Total Feed	10.0	9.0	5.0	5.0	9.0	5.0	4.0	4.0
Idaho								
Klages[b]	5.0	6.0	13.0	16.0	22.0	20.0	18.0	8.0
Piroline[b]	32.0	32.0	19.0	17.0	15.0	13.0	16.0	19.0
Karl[a]	--	3.0	9.0	7.0	4.0	--	--	--
Larker[a]	3.0	1.0	1.0	1.0	4.0	--	--	--
Other Malting	11.0	8.0	7.0	5.0	6.0	--	2.0	5.0
Total Malting	51.0	50.0	49.0	46.0	51.0	33.0	36.0	32.0
Total Feed	49.0	50.0	51.0	54.0	49.0	66.0	64.0	68.0
California								
Firlbecks III[b]	1.2	0.5	0.2	--	--	--	--	--
Klages[b]	--	--	2.6	1.3	4.4	2.9	2.1	3.7
Manker[a]	--	--	--	--	--	--	--	1.3
Other Malting	--	--	--	--	--	--	--	--
Total Malting	1.2	0.5	2.8	1.3	4.4	2.9	2.1	5.0
Total Feed	98.8	99.5	97.2	98.7	95.6	97.1	97.9	95.0
Colorado								
Moravian III[b]	--	37.7	39.7	46.9	32.0	22.6	26.1	23.6
Klages[b]	5.4	2.4	0.1	5.1	11.2	18.6	19.5	15.3

- continued -

TABLE 3. PERCENT OF U.S. BARLEY HECTARES PLANTED BY VARIETY FOR THE TEN STATES WITH GREATEST HECTARAGE (1974-1981) (CONTINUED)

State and Variety	1974	1975	1976	1977	1978	1979	1980	1981
Other Malting	40.4	8.5	3.9	2.3	--	--	--	--
Total Malting	45.8	48.6	43.7	54.3	43.2	41.2	45.6	38.9
Total Feed	54.2	51.4	56.3	45.7	56.8	58.8	54.4	61.1
Oregon								
Klages[b]	--	3.0	12.0	6.0	9.0	9.0	9.0	7.0
Manker[a]	--	--	--	--	--	2.0	5.0	3.0
Firlbecks III[b]	4.0	13.0	6.0	3.0	6.0	3.0	5.0	4.0
Piroline[b]	--	--	--	--	2.0	6.0	4.0	3.0
Karl[a]	--	2.0	2.0	4.0	2.0	--	--	--
Other Malting	22.0	11.0	8.0	--	--	--	--	--
Total Malting	26.0	29.0	28.0	13.0	19.0	20.0	23.0	17.0
Total Feed	74.0	71.0	72.0	86.0	81.0	80.0	77.0	83.0
South Dakota								
Morex[a]	--	--	--	--	--	4.0	22.8	30.2
Larker[a]	53.1	49.2	57.6	57.7	55.6	60.6	44.3	42.2
Beacon[a]	1.3	5.7	3.5	2.2	4.7	1.8	--	--
Other Malting	3.7	2.3	3.1	--	--	--	--	--
Total Malting	58.1	57.2	64.2	59.9	60.3	66.4	67.1	72.4
Total Feed	41.9	42.8	35.8	40.1	39.7	33.6	32.9	27.6
Wyoming								
Kimberly[b]	--	--	--	--	--	--	--	5.3
Klages[b]	--	--	6.9	15.7	17.7	41.4	33.9	31.2
Moravian III[b]	1.5	19.8	11.8	14.6	11.2	7.5	9.0	6.4
Other Malting	29.3	23.5	25.4	--	--	--	--	--
Total Malting	30.8	43.3	44.1	30.3	28.9	48.9	42.9	42.9
Total Feed	69.2	56.7	55.9	69.7	71.1	51.1	57.1	57.1
Washington								
Klages[b]	--	--	--	0.3	3.1	3.1	--	--
Morex[a]	--	--	--	--	--	--	1.0	1.2
Vanguard[b]	14.9	8.3	5.2	11.6	2.8	1.7	--	--
Blazer[a]	--	--	8.8	1.2	3.3	1.4	--	--
Advance[a]	--	--	--	--	--	1.3	11.1	33.0
Kimberly[b]	--	--	--	--	--	1.3	--	--
Piroline[b]	9.3	2.5	1.0	0.7	0.9	1.3	1.3	1.3
Other Malting	--	--	--	--	--	--	--	--
Total Malting	24.2	10.8	15.0	13.8	10.1	10.1	13.4	35.5
Total Feed	75.8	89.2	85.0	86.2	89.9	92.5	108.8	130.5

[a]Six-rowed varieties.
[b]Two-rowed varieties.

SOURCE: Malting Barley Improvement Association; Milwaukee, Selected Annual Reports.

TABLE 4. UNITED STATES BARLEY SUPPLY AND DISAPPEARANCE, 1964-1982

Year	Supply[a]	Domestic Use		Exports	Total Disappearance	Ending Stocks
		Feed	Food Alcohol Seed			
	(000 tonnes)					
1964	12,192	5,465	2,547	1,285	9,297	2,896
1965	11,626	4,398	2,634	1,698	8,731	2,896
1966	11,583	4,550	2,765	1,645	8,360	3,222
1967	11,561	4,463	2,809	784	8,056	3,505
1968	12,998	4,942	2,896	261	8,099	4,899
1969	14,478	5,399	3,005	218	8,622	5,857
1970	15,132	6,249	3,048	1,829	11,125	4,006
1971	14,326	5,791	3,113	893	9,797	4,529
1972	14,065	5,182	3,179	1,524	9,884	4,180
1973	13,455	5,051	3,200	2,025	10,226	3,179
1974	10,124	3,919	3,288	914	8,121	2,003
1975	10,494	3,963	3,222	523	7,707	2,782
1976	11,126	3,505	3,440	1,437	8,382	2,743
1977	12,083	3,636	3,462	1,241	8,339	3,745
1978	13,899	4,737	3,614	559	8,935	4,964
1979	13,555	4,435	3,745	1,193	9,373	4,180
1980	12,264	3,784	3,745	1,670	9,275	2,989
1981	13,629	4,136	3,832	2,395	10,363	3,266
1982[b]	13,390	4,245	3,854	1,633	9,732	3,657

[a]Includes beginning stocks, production, and imports.
[b]Preliminary estimates.

SOURCE: U.S.D.A., Agricultural Statistics, selected issues.

Canada

A distinguishing feature of grain production in Canada is the few types of grain which are produced, relative to the United States. Major grains which are produced include wheat, barley, oats, and rapeseed. Barley production in the three prairie provinces accounts for about 90 percent of Canada's total barley production. Traditionally, Saskatchewan and Alberta are about equal in planted area, whereas Manitoba is of less significance (Table 7). In recent years, however, area planted to barley in Alberta has increased and typically accounts for about 50 percent of the barley area in the prairie region. Saskatchewan follows Alberta in area planted to barley and in 1981 1.52 million hectares were planted to the crop. Manitoba is the province with the smallest barley acreage and typically plants less than one million hectares. Yields vary among the provinces and are generally greatest in Alberta, which produces more than 50 percent of the output in the Prairie Region as shown in Table 8. In 1981, 12.2 million tonnes of barley were produced in the Prairie Region, which was up from 10.3 and 7.7 million tonnes in the previous two years.

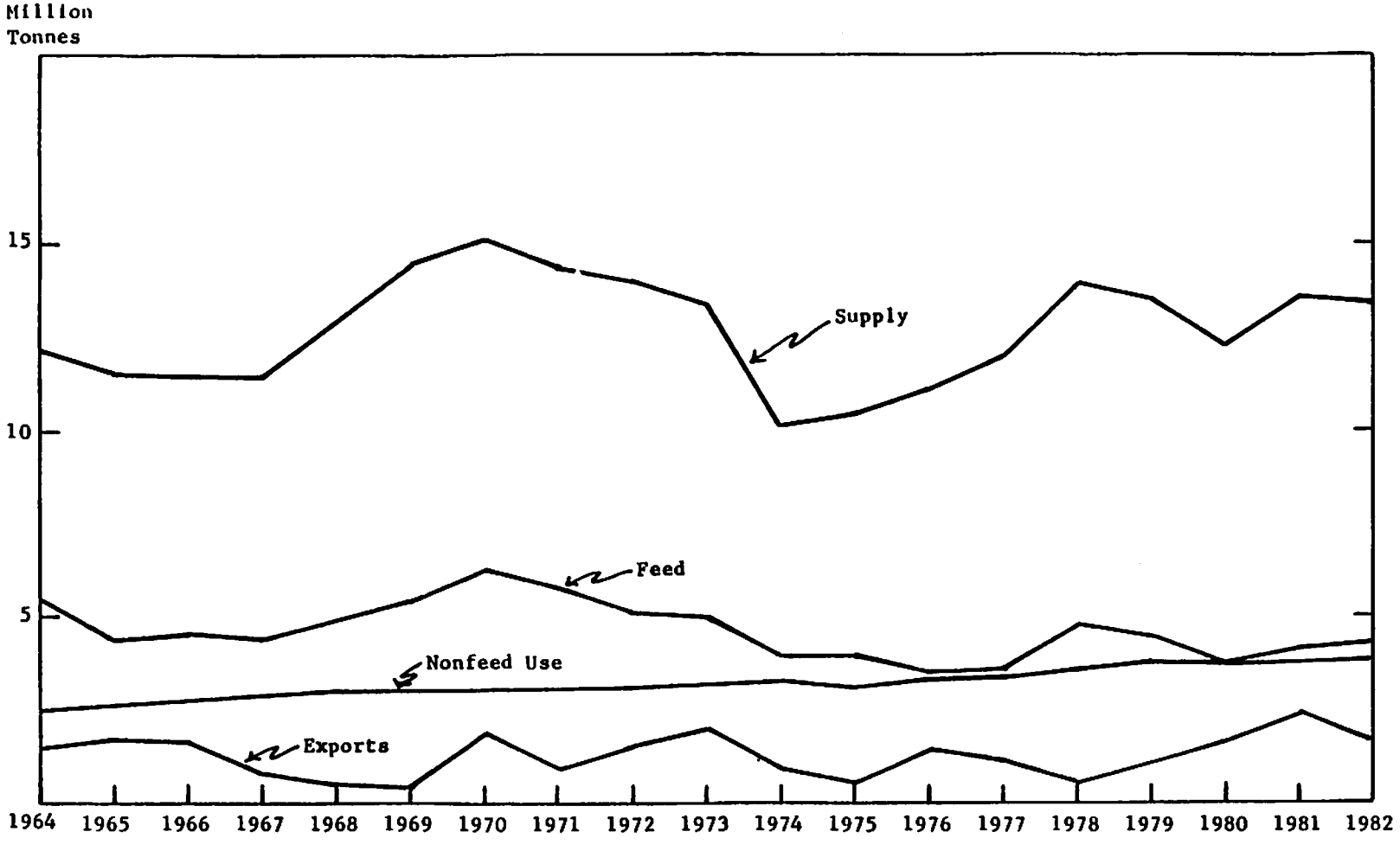

Figure 1. Supply and Disposition of Barley in the United States

TABLE 5. MALT UTILIZATION IN THE UNITED STATES BREWING INDUSTRY, 1955-1980

Year	Total Utilization	Utilization Per Barrel
	(000 tonnes)	(kg/hl)
1959	1,185	11.1
1960	1,224	11.0
1961	1,205	11.0
1962	1,232	10.9
1963	1,245	10.8
1964	1,309	10.8
1965	1,368	10.8
1966	1,393	10.6
1967	1,484	10.9
1968	1,501	10.9
1969	1,557	10.8
1970	1,688	10.7
1971	1,669	10.6
1972	1,748	10.6
1973	1,768	10.5
1974	1,893	10.5
1975	1,916	10.4
1976	1,886	10.0
1977	1,955	9.7
1978	1,992	9.9
1979	2,217	10.3
1980	2,285	10.3

SOURCE: 1981 Brewers Almanac, The United States Brewers Association, Inc. Washington, D.C., 1981.

An indication of the importance of malting barley production relative to feed barley production can be ascertained by examining the acreage planted to each variety. These figures are shown in Table 9 for the years 1974 to 1981. The malting variety which has been most popular in Alberta is the two-rowed variety 'Betzes' except in 1980 and 1981 when the six-rowed variety 'Bonanza' had the greatest percentage. Bonanza, the most popular malting variety grown in Saskatchewan, has been produced on about 33 percent of the area in recent years. Bonanza, also the most important variety in Manitoba, accounted for about 40 percent of the 1981 acreage.

Total supply and demand for barley 1 Canada since 1967 are shown in Table 10 and Figure 2. The data indicate that the quantity of barley used for feed has been increasing since 1967. In that year about 4 million tonnes of barley was used for feed. This has since increased to about 6 million tonnes in 1978. In contrast, the amount of barley used for malting has increased only slightly since 1967. On the other hand, exports of barley have increased significantly since 1967. Less than 1 million tonnes per year were exported prior to 1968. These exports have increased since then and were close to 4

TABLE 6. UNITED STATES IMPORTS AND EXPORTS OF BREWING MALT FROM 1962-1981

Year	Exports	Imports
	----------(000 tonnes)----------	
1962	38.6	67.3
1963	N.A.	N.A.
1964	40.8	42.5
1965	32.3	22.3
1966	40.8	26.7
1967	28.5	22.0
1968	29.9	22.4
1969	27.1	19.1
1970	28.7	24.0
1971	35.5	12.0
1972	49.6	12.5
1973	54.2	13.4
1974	39.2	21.7
1975	23.7	52.9
1976	20.1	31.1
1977	22.1	44.9
1978	23.6	47.2
1979	20.9	66.1
1980	26.76	72.6
1981	15.5	50.4

SOURCE: 1981 Brewers Almanac, The United State Brewers Association, Inc. Washington, D.C., 1981, and U.S. Foreign Agriculture Trade Statistical Report, Calendar Year 1981.

million tonnes in the late 1970s. The largest use of Canadian barley is for domestic livestock feed; the second largest outlet is exports. Barley used for malt is relatively minor and in most years accounts for about 10 percent of total domestic use.

The major domestic use for malt in Canada is in the brewing industry. Utilization in the brewing industry has been increasing at a rate of about 15,000 tonnes per year. Exports of malt from Canada have been increasing since 1967 when 89,000 tonnes was exported. By 1978 malt exports had increased to 207,000 tonnes and represented about 41 percent of the total disposition of malt.

Producer Decisions with Respect to Barley Production

Producers generally allocate land between crops according to expected net returns per hectare. In other words, hectarage allocation to barley is

TABLE 7. HECTARES OF BARLEY PLANTED IN CANADA, BY PROVINCE (1955-1981)

Crop Year	Manitoba	Saskatchewan	Alberta	Prairie Region	Total
	(000 hectares)				
1955	845	1,556	1,498	3,900	4,001
1956	626	1,225	1,459	3,310	3,395
1957	689	1,534	1,503	3,726	3,805
1958	641	1,538	1,505	3,684	3,758
1959	514	1,198	1,404	3,116	3,191
1960	376	991	1,335	2,703	2,775
1961	265	774	1,160	2,170	2,238
1962	254	659	1,149	2,062	2,140
1963	236	781	1,379	2,396	2,500
1964	201	566	1,343	2,111	2,223
1965	243	708	1,372	2,323	2,477
1966	354	913	1,570	2,837	3,020
1967	393	951	1,732	3,076	3,287
1968	473	1,016	1,882	3,371	3,583
1969	486	1,093	1,983	3,561	3,787
1970	607	1,335	1,821	3,764	4,004
1971	830	2,255	2,302	5,387	5,657
1972	849	1,862	2,104	4,816	5,062
1973	850	1,699	2,044	4,593	4,839
1974	728	1,699	2,104	4,532	4,775
1975	607	1,416	2,185	4,208	4,468
1976	647	1,194	2,246	4,087	4,354
1977	770	1,538	2,206	4,514	4,751
1978	708	1,250	2,044	4,002	4,259
1979	587	1,052	1,801	3,440	3,684
1980	809	1,315	2,185	4,309	4,634
1981[a]	931	1,518	2,529	4,979	5,392

[a]Estimates.

SOURCE: Statistical Handbook, Canada Grains Council, selected issues, Winnipeg.

based on expected profits per hectare relative to alternative crops.[2] Production costs, yields, and prices are the main factors affecting the decision (MacDonald). The latter two are uncertain and are based on expectations. Cost per acre is known with relative certainty prior to production. However, returns are uncertain due to yield and price fluctuations. Other factors which affect the decision to produce barley are a) agronomic factors, b) government programs, but only to the extent they differentiate between grains, c) the utilization of labor and equipment throughout the growing and

[2]Generally the alternatives in the principal production regions are wheat and more recently sunflower.

TABLE 8. PRODUCTION OF BARLEY IN CANADA BY PROVINCE (1955-1981)

Crop Year	Manitoba	Saskatchewan	Alberta	Prairie Region
	(000 tonnes)			
1955	871	2,264	2,177	5,312
1956	914	2,155	2,634	5,704
1957	718	1,742	2,090	4,550
1958	958	1,829	2,243	5,029
1959	718	1,524	2,308	4,550
1960	522	1,480	2,068	4,071
1961	196	435	1,676	2,308
1962	457	1,045	1,938	3,440
1963	348	1,698	2,591	4,637
1964	348	740	2,330	3,418
1965	479	1,415	2,304	4,398
1966	610	1,281	3,462	6,053
1967	719	1,372	3,005	5,095
1968	936	1,742	3,875	6,554
1969	914	2,373	4,267	7,555
1970	1,110	3,091	4,115	8,317
1971	2,047	5,486	4,877	12,410
1972	1,851	3,854	5,007	10,712
1973	1,807	3,570	4,289	9,667
1974	1,154	2,917	4,180	8,252
1975	1,110	2,830	4,964	8,905
1976	1,459	2,961	5,487	9,906
1977	2,047	3,723	5,443	11,213
1978	1,851	2,917	4,964	9,732
1979	1,262	1,959	4,550	7,771
1980	1,568	2,787	5,966	10,321
1981	2,351	3,353	6,532	12,236

SOURCE: Statistical Handbook, Canada Grains Council, selected issues, Winnipeg.

harvest season which is enhanced due to the early maturity of barley relative to competing crops, d) diversification of production risk, and e) the ability to hedge or lock-in prices for production of other grains. The latter is especially important to barley producers because they have been unable to forward contract cash sales, or hedge. Consequently, their exposure to price risk is greater in barley than in the other grains.

Production costs in 1982 for barley and competing crops in east central North Dakota, an important region for barley production, are shown in Table 11. Total direct and indirect costs for barley are slightly less than for the other grains, of which sunflower has the greatest costs. Land costs vary for each producer, depending on whether they own or rent. However, they would be the same for each of the grains. Total direct and indirect costs for each of the crops for 1980, 1981, and 1982 are shown in Table 12. The costs presented in Table 12 do not include those attributed to land.

TABLE 9. PERCENT OF CANADIAN BARLEY HECTARES PLANTED BY VARIETY IN THREE WESTERN CANADIAN PROVINCES (1974-1981)

Province and Variety	1974	1975	1976	1977	1978	1979	1980	1981
	(percent)							
Alberta								
Bonanza[a]	13.7	15.5	18.6	18.4	19.5	19.7	23.3	24.5
Conquest[a]	17.4	17.6	16.1	15.3	14.3	14.6	14.4	11.8
Gateway[a]	9.3	9.5	8.9	7.4	6.6	6.3	4.4	4.2
Betzes[b]	21.9	20.7	22.2	24.4	23.2	22.3	19.9	17.5
Klayes[b]	--	--	1.3	3.4	7.4	8.9	12.5	12.1
Total Malting	73.9	77.0	79.9	81.1	83.1	81.6	81.9	81.2
Total Feed	26.1	23.0	20.1	18.9	16.9	18.4	18.1	18.8
Saskatchewan								
Bonanza[a]	27.2	29.2	32.7	36.7	36.6	33.0	33.1	33.8
Conquest[a]	29.5	28.8	27.1	21.1	19.0	16.5	14.9	11.0
Betzes[b]	20.9	79.9	20.3	24.6	22.4	20.3	16.2	12.0
Klayes[b]	--	--	--	1.2	7.2	15.6	21.9	24.6
Total Malting	85.2	83.3	84.8	86.8	88.2	88.6	89.3	90.8
Total Feed	14.8	16.7	15.2	13.2	11.8	11.4	10.7	9.2
Manitoba								
Bonanza[a]	23.4	25.5	29.5	33.8	34.6	35.9	43.0	39.6
Conquest[a]	21.5	20.1	20.0	19.8	23.3	22.0	15.8	14.9
Beacon[a]	--	2.7	7.1	8.0	7.7	6.0	2.7	4.0
Betzes[a]	.7	--	--	--	--	--	--	--
Klayes[a]	--	--	--	--	--	.8	.8	1.3
Total Malting	47.1	48.3	56.6	61.6	65.7	64.7	62.3	59.8
Total Feed	52.9	51.7	43.4	38.4	34.3	35.3	37.7	40.2

[a]Six-rowed variety.
[b]Two-rowed variety.

SOURCE: Brewing and Malting Research Institute, Winnipeg.

Net return per hectare is the difference between expected price and total direct and indirect costs. Prices are uncertain, and producers use expected prices in their calculation of net return per hectare. These are derived from a) past prices and/or projections by public or private forecasters and b) forward contract prices for the other grains. These are not generally available for barley. Usually, more land is allocated to the crop which yields the highest net return per hectare.

Marketing and Price Determination

The purpose of this section is to present an overview of the price system for barley in North America. Separate sections are presented for both

TABLE 10. CANADA BARLEY SUPPLY AND DISAPPEARANCE, 1967-1981[a]

Year	Supply[b]	Domestic Use		Export	Total Disappearance	Ending Stock
		Feed	Malting			
	(000 tonnes)					
1967	8,374	3,932	368	901	5,524	2,850
1968	9,950	4,344	377	575	5,652	4,298
1969	12,382	5,238	401	1,923	7,917	4,465
1970	13,355	5,399	415	3,910	10,214	3,141
1971	16,240	6,490	455	5,020	12,411	3,829
1972	15,114	6,457	421	3,598	10,911	4,203
1973	14,427	6,266	412	2,776	9,889	4,538
1974	13,340	5,318	481	3,013	9,236	4,104
1975	13,624	5,647	435	4,341	10,860	7,764
1976	13,277	5,367	433	3,799	10,059	3,218
1977	15,017	5,401	398	3,590	9,809	5,208
1978	15,595	6,134	347	3,862	10,734	4,895
1979	13,375	6,465	315	4,147	11,370	2,005
1980	13,273	5,897	300	3,574	10,270	3,003
1981	16,320	--	--	--	--	--

[a]Year 1967 refers to 1967/68 crop year.
[b]Includes opening stocks and production.

SOURCE: Statistical Handbook, Canada Grains Council, Selected Issues, Winnipeg.

the United States and Canada even though the two countries can be considered one market affected by the same fundamental supply and demand factors.

United States

Prices for barley in North America are largely determined by supply and demand factors. The supply of barley in any marketing year includes carry-in stocks, imports, and production. Demand includes that for domestic malting, feed, and seed as well as exports and carryover stocks. The supply of barley is functionally related to its price and prices for competing crops, as discussed above, as well as government programs, weather, technology, and input costs. The quantity of barley demanded also depends on its price, prices for competing grains, income, and other factors (e.g., tastes and preferences). The demand for feed barley is very sensitive to prices in the feed complex such as those for corn and soybean meal. In recent years barley prices have increased relative to corn prices and have resulted in a decreasing quantity of barley used as a feed grain. The demand for malting barley is largely insensitive to price because substitution possibilities are limited. The demand for malting barley depends largely on factors which affect the demand for beer such as income, tastes, preferences, etc.

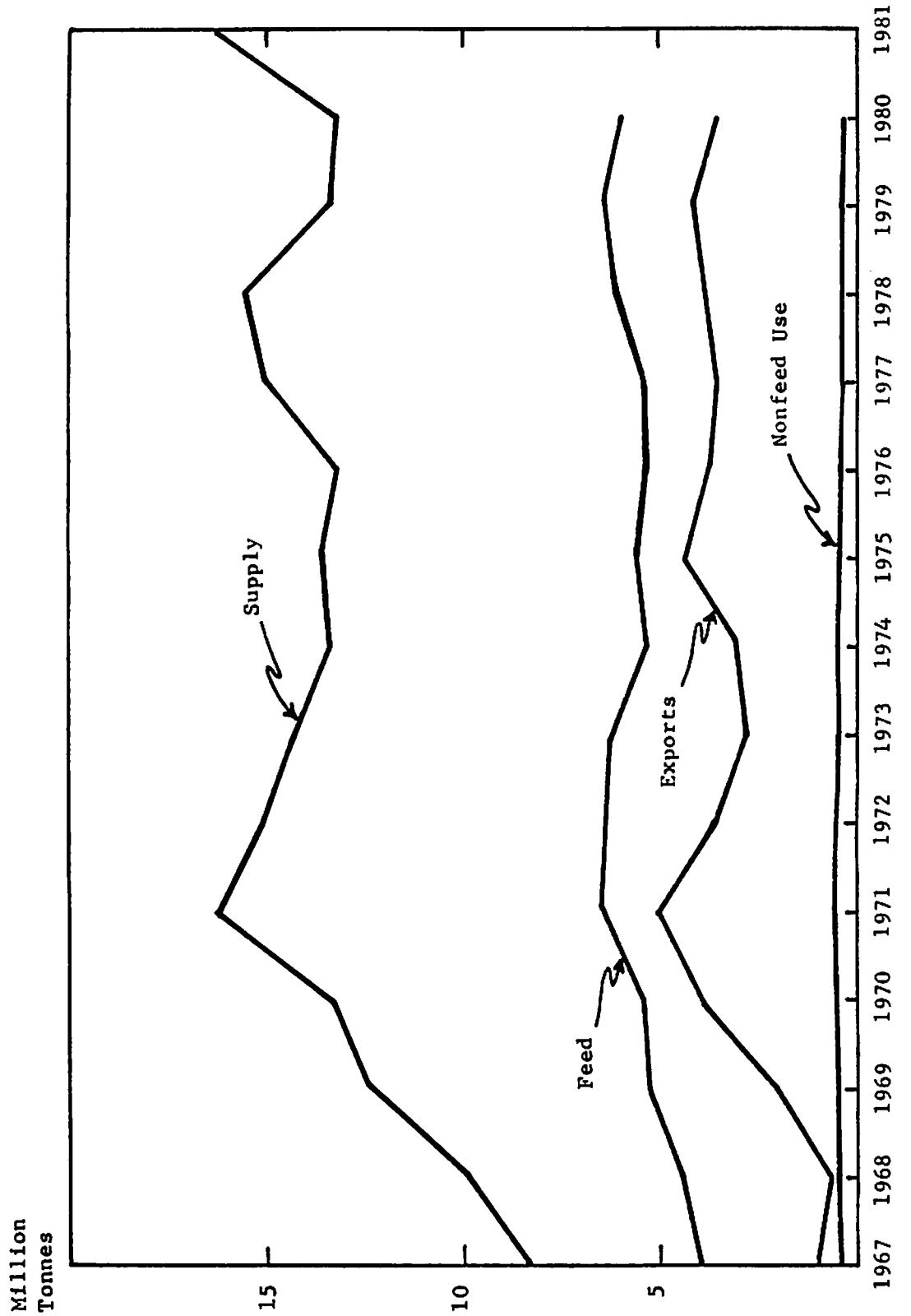

Figure 2. Supply and Disposition of Barley in Canada

TABLE 11. PRODUCTION COSTS FOR CROPS IN EAST CENTRAL NORTH DAKOTA, 1982

	Wheat	Durum	Barley	Sunflower
EXPECTED YIELD (tonnes/hectare)	2.35	2.35	3.23	1.63
Direct Costs ($/hectare)				
Seed	$ 22.41	$ 32.12	$ 16.61	$ 16.80
Nitrogen	---	---	---	6.92
Phosphate	15.82	15.82	19.77	15.82
Potash	---	---	6.42	---
Anhydrous Ammonia	17.67	17.67	19.27	11.24
Fertilizer Application	11.12	11.12	16.68	11.12
Pre-plant Herbicide	---	---	---	50.66
Post-plant Herbicide	28.66	28.66	13.54	13.29
Insecticide	---	---	---	---
Custom Spray	---	---	---	7.41
Drying	---	---	25.53	17.92
Fuel and Lubrication	28.62	28.62	15.44	25.23
Repairs	16.83	16.83	---	13.49
Hired Labor	---	---	---	---
Overhead	9.88	9.88	9.88	9.88
Interest on Operating Capital	14.65	15.67	13.96	18.24
TOTAL DIRECT COSTS ($/hectare)	$165.66	$176.39	$157.10	$218.02
Indirect Costs ($/hectare)				
Machinery Ownership	$ 46.63	$ 46.63	$ 40.16	$ 44.48
Labor	17.20	17.20	15.74	14.28
Management	22.96	24.02	21.30	27.68
Total Indirect Costs, Excluding Land	$ 86.79	$ 87.85	$ 77.20	$ 86.44
TOTAL COSTS, EXCLUDING LAND ($/hectare)	$252.45	$264.24	$234.30	$304.46
LAND CHARGE ($/hectare)	$ 81.55	$ 81.55	$ 81.55	$ 81.55
TOTAL COSTS ($/hectare)	$334.00	$345.79	$315.85	$386.01
TOTAL DIRECT AND INDIRECT COST PER TONNE	$107.43	$112.44	$ 72.54	$186.79
TOTAL COST PER TONNE	$142.13	$147.14	$ 97.79	$236.82

SOURCE: Reff and Schaffner.

TABLE 12. TOTAL DIRECT AND INDIRECT COSTS FOR SELECTED CROPS IN EAST CENTRAL NORTH DAKOTA, 1980-1982

	Wheat	Durum	Barley	Sunflower
Total Direct and Indirect Costs ($/hectare)				
1980	$ 240.78	$250.57	$246.57	$259.61
1981	201.10	214.44	196.58	252.89
1982	252.45	264.24	234.30	304.46
Cost Per Tonne ($/tonne)				
1980	102.46	106.63	91.32	159.27
1981	85.57	91.25	60.73	155.15
1982	107.43	112.44	72.54	186.79

Price differences usually exist between malting barley and feed barley. These are attributed to quality factors as well as supply conditions. If the supply of barley in any year is relatively large, the production of malting barley is generally large and the price differential between malting and feed barley is small. Conversely, if the supply of barley is relatively small, larger premiums are paid for malting barley.

The Minneapolis Grain Exchange is the place where most buyers and sellers meet to transact business in barley. The exchange has futures contracts for wheat, and recently sunflower, which provide hedging opportunities for processing firms, exporters, country elevators, and producers. However, there are no futures contracts for barley. Other regional feed barley markets exist in the United States such as Portland, Stockton, and Los Angeles on the west coast, and Duluth. The Minneapolis Grain Exchange is the only cash market for malting barley, and one of the few public markets for barley in the world.

Barley can either be purchased by processors directly, based on a sample, or through a commission firm. Maltsters traditionally have purchased barley based on samples which are drawn as the railcar was loaded at the country elevator and subsequently sent to the floor of the exchange. After the barley is sold based on the sample, the car is consigned by the commission firm to the consignee. Purchases also can be made from the country elevator in which case the car would be consigned directly. This type of sale is made without the benefit of a prior sample but the buyer usually retains the right to reject the car if it is unsatisfactory. This latter means of procurement has become more prevalent in recent years.

Prices for barley are established at the Minneapolis Grain Exchange through interaction between buyers and sellers. The prices so established form the basis for other barley prices. Prices in the production region are Minneapolis price less the cost of handling and transportation. Average prices for malting and feed barley at Minneapolis and in North Dakota are shown in Table 13. The Minneapolis price is the average of midmonth prices and is a good indicator for malting barley prices; the extent that the malting

TABLE 13. AVERAGE ANNUAL MALTING AND FEED BARLEY PRICES AT MINNEAPOLIS AND MALTING BARLEY PRICES AT NORTH DAKOTA, 1967-1981

	Minneapolis		North Dakota
	Malting[a]	Feed[b]	Malting[c]
		$/M.T.	
1967	55.12	52.35	44.55
1968	50.98	46.39	40.30
1969	48.69	45.01	36.94
1970	54.20	50.98	37.66
1971	51.90	47.77	39.65
1972	66.14	53.74	41.10
1973	121.25	93.24	74.10
1974	185.10	118.50	136.95
1975	153.40	109.31	147.55
1976	136.41	107.93	118.08
1977	99.67	77.16	85.97
1978	104.72	82.67	83.36
1979	123.09	99.21	95.65
1980	156.67	120.46	103.26
1981	154.81	109.33	121.73

[a]No. 3 or Better Malting, 60-70% plump at Minneapolis as reported by USDA Grain Market News.
[b]No. 3 or Better Feed Barley at Minneapolis as reported by USDA Grain Market News.
[c]Average of the midmonth prices received for malting barley by North Dakota farmers.

barley price exceeds the feed barley price indicates the premium paid. Barley prices have more than doubled since 1967. All three price series generally correspond with each other.

The differences between malting and feed barley prices are particularly important from a producer's perspective. The premiums, relatively small until 1972, were very high in 1974, 1975, and 1976 and have declined since. These differences are largely explained by the supply of barley. For example, in 1974, 1975, and 1976 barley supplies were smaller than normal (see Figure 1). The difference between the Minneapolis price and that in North Dakota represents the cost of transportation and handling margins. These have been generally increasing through time and indicate why prices in the producing region have not increased as fast as those in Minneapolis.

An important feature of the cash market for malting barley is that prices vary across samples and are normally attributed to relatively small differences in quality.[3] Several nongrade factors affect prices of barley.

[3]Crabtree, in a recent thesis, conducted an extensive analysis of factors affecting price differentials in the Minneapolis malting barley market. These results are also reported in Wilson and Crabtree.

In North Dakota, Morex, Larker, Glenn, and Beacon are six-rowed malting barley varieties which are suitable for malting. Each one of these possesses more or less of the characteristics desirable for malting. During the period 1978-1981, Larker had 3 percent more kernel plumpness than did Morex, yet Morex had 0.5 percent less protein than Larker (Foster). Plumpness is associated with uniformity of germination in the malting process. At least 96 percent of the kernels must germinate to be classified as good quality malting barley (Briggs). Low protein content of Morex is combined with high extract which provides the carbohydrate from which alcohol originates. Maltsters try to avoid barley with over 13.5 percent protein. An example of price differentials for different varieties is shown in Table 14. The price of Morex is for the first day of the month. Glenn was discounted by $4.59/tonne throughout the period. Larker started out with a sizable discount, but sold at a premium of $2.30/tonne by January. The discount for Beacon ranged from $9.19 to $25.27/tonne.

TABLE 14. TOP PRICE FOR MALTING BARLEY AT THE MINNEAPOLIS GRAIN EXCHANGE, 1981

Month	Morex	Price Differential from Morex		
		Glenn	Larker	Beacon
	($/tonne)			
September 1	158.48	-4.59	-11.48	-25.27
October 1	147.00	-4.59	0	-13.78
November 1	147.00	-4.59	0	- 9.19
December 1	147.00	-4.59	- 2.30	-13.78
January 1, 1982	144.70	-4.59	+ 2.30	- 9.19

SOURCE: Rasmusson, D. C. "Development of Improved Malting Barley Varieties for Minnesota." Proceedings, Red River Valley Barley Days, Grand Forks, North Dakota. Sponsored by the Malting Barley Improvement Association, Milwaukee, Wisconsin, January 14, 1982, p. 28.

Price differentials arise due to variations in protein content and kernel plumpness. Table 15 illustrates how prices can be affected by quality variations. Carlot No. 3 exhibited the lowest price because of the high protein content, nearly 14 percent. The highest price went to carlot No. 2. A high plumpness (74 percent) and lower protein content (13.0 percent) commanded the highest premium. In addition, other factors such as grade, staining, etc., influenced price differentials. A recent study by Wilson and Crabtree estimated implicit premiums for plumpness and discounts for protein across carlot samples of malting barley at the Minneapolis Grain Exchange. Implicit premiums and discounts simply refer to the premiums and discounts for plumpness and protein respectively which are implied in the observed price of malting barley. Carlot prices of malting barley were analyzed during 1978/79 to 1981/82 by crop year. The results indicated that these premiums and discounts increased during the period and there was an inherent varietal premium for Morex in 1981/82.

TABLE 15. PRICE OF NO. 2 MOREX AT THE MINNEAPOLIS GRAIN EXCHANGE, MARCH 26, 1982

Carlot No.	Protein %	Plumpness %	Price ($/tonne)
1	13.30	66	$140.11
2	13.00	74	142.41
3	13.95	67	133.22
4	13.00	64	137.81

SOURCE: Daily Market Record, Warren E. Maul, Publisher, Minneapolis, Minnesota, March 29, 1982.

The results also suggest that changes may be occurring in the pricing structure of malting barley. In particular, in the latter years of the study prices 1) were influenced less by the feed grains sector and 2) had a greater amount of variability which was not explained by observed quality characteristics.

Malt, one of the principal products produced from barley, is used primarily in the brewing process. Milwaukee traditionally has been a major malting center and prices for malt are quoted weekly. Annual average malt prices at Milwaukee are shown in Figure 3 and are compared to the malt equivalent price of barley. Malting barley prices at Minneapolis are converted to the malt equivalent assuming 100 pounds of barley produces 82 pounds of clean malt.[4] In other words, the barley price is for enough barley to produce one tonne of malt. Malt prices are affected primarily by changes in barley prices and also by increases in the cost of malting over the longer period. Margins for malting are calculated by subtracting the cost of barley and the cost of transporting barley between Minneapolis and Milwaukee from the price of malt. Thus, this margin indicates the value added by maltsters. The return from the sale of by-products is not included. Malting margins are presented in Table 16 using annual average data, thereby reducing the effect of intrayear variability. The cost of transporting sufficient barley to produce one tonne of malt from Minneapolis to Milwaukee was also deducted from the price of malt to obtain the net margin. The net margins so derived are inflated to 1980 dollars using the Wholesale Price Index to isolate the effects of inflation and make more meaningful comparisons. The margins have varied through time, increasing from $95.25/tonne in 1966 to a peak of $119.70/tonne in 1968. Thereafter, they decreased to $56.85/tonne in 1973, primarily due to high barley prices. Peaks occurred again in 1975 and 1977 at $126.00/tonne. These value added figures indicate the revenue available for financing malting operations and include all the revenue except the sale of by-products.

[4]The appropriate conversion is that 100 tonnes of clean barley would produce 81-83 tonnes of clean malt. The conversion for country-run barley would be less.

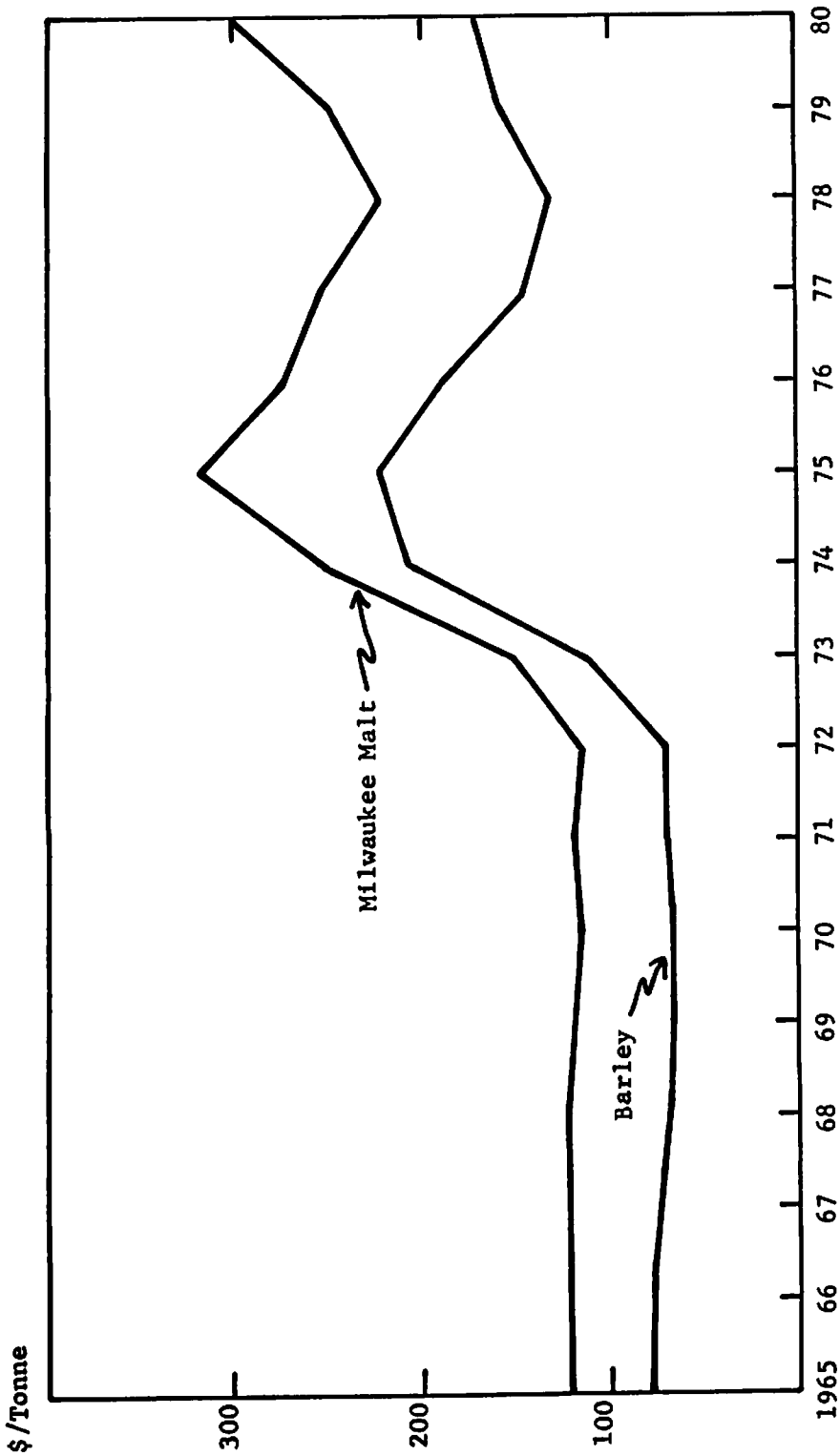

Figure 3. Average Annual Milwaukee Malt Prices Compared to Malt Equivalent Barley Prices in Minneapolis (1965-1980)[a]

[a]The conversion in tonnes is to produce one tonne of malt requires 1.2195 tonnes of barley.

TABLE 16. CALCULATION OF MALTING MARGINS AT MILWAUKEE (1965-1980)

Year	Malt Price Basis Milwaukee	Malting Barley Price Basis Minneapolis	Transportation[a]	Margin[b]	Margin in Adjusted 1980 Dollars[c]
			$/tonne		
1965	122	64	9.71	34.29	97.97
1966	122	64	9.71	34.29	95.25
1967	122	62	9.71	37.29	100.78
1968	122	56	9.71	44.29	119.70
1969	118	54	9.71	42.29	108.43
1970	115	54	9.71	39.29	98.22
1971	119	57	9.71	39.79	93.55
1972	115	57	9.71	35.29	82.10
1973	150	93	9.71	27.29	56.85
1974	252	169	9.95	35.05	58.41
1975	319	184	11.56	83.44	126.42
1976	272	156	13.17	68.83	99.75
1977	754	120	14.52	93.48	126.32
1978	222	109	15.33	74.67	94.51
1979	249	130	16.67	73.33	80.58
1980	301	145	21.65	108.35	108.35

[a]Transport rate is for 1.2195 tonnes barley which is enough to produce one tonne of malt.
[b]Margin is equal to the malt price less the cost of the amount of barley sufficient to produce one tonne of malt and transport cost.
[c]Deflated using the Wholesale Price Index.

The Canadian Marketing System

The focal point of the marketing system in Canada is the Canadian Wheat Board. All barley purchased for export or domestic food processing must be purchased from the Canadian Wheat Board. Consequently, the board is integrally involved in price formulation and the logistics of marketing.

Canadian Wheat Board

The Canadian Wheat Board has evolved because of pressure for higher and more stable prices. The Canadian Wheat Board is solely responsible for the marketing of export wheat, oats, barley, and domestic food grains (i.e., malting barley). The general objective of the Canadian Wheat Board is to "sell and dispose of grain acquired by it at such prices as it considers reasonable with the object of promoting the sale of grain produced in Canada in world markets."[5] The policy is normally interpreted to include the following specific objectives:

[5]Government of Canada, Canadian Wheat Board Act (Ottawa: Queen's Printer, 1972), p. 5.

1) market as much grain as possible at the "best" prices;

2) provide price stablility for Prairie grain producers; and

3) ensure each producer a fair share of the available grain market.

These objectives are implemented through various procedures which are administered by the Canadian Wheat Board.

An important feature of the Canadian Wheat Board is its price pooling mechanism which provides producers with intrayear price stability. An initial payment is announced for each type of grain, traditionally in March, for grain delivered during the following crop year. At the time of delivery, producers are paid the initial payment net of transportation and handling charges. Revenues from grain sales are pooled in separate accounts for each of the grains from which the costs of operating the Board and initial payments are deducted. The remainder, called the final payment, is paid producers in proportion to the amount of grain they sold. Periodically, an adjustment payment is paid to producers if market conditions improve within the year. Initial, adjustment, final, and total payments paid Canadian producers since 1970/71 are presented in Table 17. Prices listed are for No. 1 C.W. 6-row, which is generally used for malting, and No. 1 Feed. Initial payments have been increasing gradually since 1970/71. In 1980/81 and 1981/82 they increased to $126.93/tonne and $124.00/tonne for the two types of barley, respectively. In 1975, a pooling system which separated malting barley from regular barley shipments was established by the Canadian Wheat Board, and the full premium price is now paid to malting barley producers. These are shown in Table 17 but applied to a very small proportion of total deliveries.

A second important feature of the Canadian Wheat Board is a delivery quota which is used to regulate movement of grain into the marketing system. Separate quotas are announced for each type of grain (including grains which are not marketed directly by the Board) and are applied on an area basis. Changes in delivery quotas throughout the year are the signals used to attract grain into the marketing system. The allocation of transportation equipment for all grain movements was formerly controlled by the Board. At present, the overall allocation is done by the Grain Transportation Authority, which is an independent body.

A third important characteristic of the Canadian Wheat Board is its method of sale of barley for export and domestic uses. Generally, there are two means for making an export sale. One is for the Wheat Board itself to negotiate terms of the sales contract and for a private company to arrange delivery and documentation. A second mechanism is for sales to be negotiated by a private company, which, in turn, purchases the barley from the Wheat Board. In this latter case, the private company acts as an agent for the Wheat Board. In recent years direct sales by the Wheat Board have become more popular, and an average of 65.9 percent of barley sales were made via this method in the past three crop years.

Under legislation passed in 1949, malting barley grown in western Canada must be purchased through the Canadian Wheat Board. Malting barley is essentially sold on a sample market with prices established by the Canadian Wheat Board on the basis of official grades established by the Canadian Grain

TABLE 17. PAYMENTS TO CANADIAN PRODUCERS FOR BARLEY, 1970/71-1981/82[a]

Crop Year	1 C.W. 6 Row				Designated Malting Barley		1 Feed			
	Initial	Adjustment	Final	TOTAL	2 C.W. 6-Row TOTAL	2 C.W. 2-Row TOTAL	Initial	Adjustment	Final	TOTAL
	($/tonne)									
1970/71	42.71	4.59	--	47.30	--	--	37.20	4.59	--	41.79
1971/72	42.71	--	--	42.71	--	--	37.20	--	--	37.20
1972/73	45.01	4.13	22.97	72.11	--	--	39.50	4.13	23.63	67.26
1973/74	69.81	34.45	38.81	143.07	--	--	64.30	34.45	20.31	119.06
1974/75	76.70	27.56	45.65	149.91	--	--	71.19	27.56	8.30	107.05
1975/76	76.70	13.78	52.31	142.79	160.98	160.98	73.49	13.78	16.79	104.06
1976/77	83.59	--	20.16	103.75	148.59	149.58	80.38	--	11.12	91.50
1977/78	83.59	--	17.31	100.90	107.18	110.35	80.38	--	8.01	88.39
1978/79	79.00	3.67	40.87	123.54	112.51	119.81	76.00	3.67	11.41	91.08
1979/80	83.00	9.19	18.48	110.67	167.74	167.74	80.38	9.19	17.90	107.47
1980/81	126.94	6.99	15.82	149.75	207.30	207.29	124.01	6.99	15.55	146.55
1981/82	126.93	--	--	--	--	--	124.00	--	--	--

[a]These prices are basis in-store at Thunder Bay.

Commission. Prices are adjusted at irregular intervals throughout the crop year in response to market conditions. A buyer of malting barley purchases this grain from the Canadian Wheat Board on the basis of a specified volume of barley at a specified price. Samples of barley are submitted by individual farmers, normally through one of the line elevator companies. These samples are evaluated by maltsters for the domestic and export malt market and by grain companies for the export malting barley market. Permits are issued for shipment of carlot quantities of those samples which have been selected as having suitable malting quality. On shipment, a sample of the loaded carlot is compared with the original sample to ensure that quality is equivalent. Delivery quotas for malting barley are established by the Canadian Wheat Board; individual farmers are initially limited to the shipment of one or two carlots (60 to 90 tonnes per car). The timing and extent of quota increases during the crop year are determined by the quality of the crop and the market demand.

Domestic Markets and Prices

Canada has a dual marketing system for feed barley used domestically. It is merchandised either through the private grain trade, or the Canadian Wheat Board. Price determination for domestic feed grains went through some rather dramatic changes in the 1970s. Prior to 1974, the Canadian Wheat Board held exclusive rights for marketing feed grain outside the Prairie Region. In 1974, a change was instituted to allow marketing firms to buy feed grains and sell them in the rest of Canada (Carter and Kraft, 1981a). Changes in the marketing structure for domestic feed grains currently are being evaluated. The Winnipeg Commodity Exchange is an important part of the open market system for domestic feed grains. Futures contracts are traded there for domestic feed barley, oats, wheat, rapeseed, and flaxseed. Feed processors, exporters, and producers can use the futures markets to protect themselves from adverse changes in cash prices. The Winnipeg barley contract is traded in board lot sizes of 100 tonnes and job lot sizes of 20 tonnes. Delivery months are in October, December, March, May, and July. The contract calls for a deliverable grade of No. 1 feed barley with premiums and discounts associated with deviations from the contract grade. Prices are quoted in dollars per tonne and are basis in-store at Thunder Bay.

Two major changes in domestic feed grain prices have occurred since 1974. In 1976 a formula was established for pricing feed grain sold by the Canadian Wheat Board. The formula is related to the price of U.S. corn basis Montreal, thereby making domestic feed grain prices, as priced and sold by the Canadian Wheat Board, competitive with world prices. The formula places an upper bound on domestic feed grain prices and has on occasion interfered with the operation of the open market. The second change occurred in 1979 when all feed grains sold on the open market became subject to delivery quotas administered by the Canadian Wheat Board. This policy has an effect on domestic prices only when the market clearing quantity of barley is not moved into export positions because of inadequate transportation capacity or the Board's sale strategy as reflected by restrictive quotas. In these cases the domestic price of barley falls below the world price (Carter and Kraft, 1981a).

Physical and Facilitating Marketing Functions

Two important functions in barley marketing in North America are grading and transportation. Each of these are discussed in this section with respect to each country.

Grading

Grade standards are established by government agencies in each country and provide a method for differentiating agricultural products.

Grade Standards for Barley in the United States

The U.S. Grade Standards provide a method to reflect seed quality characteristics using numerical values which are placed on a set of grading factors. The numerical grade is determined by the lowest quality of any of the factors. Barley is broken down into the following three classes:

1. Six-rowed barley. This class is further divided into three subclasses: six-rowed malting barley, six-rowed blue malting barley, and six-rowed barley.

2. Two-rowed barley. Barley of the two-rowed type is divided into two subclasses: two-rowed malting barley and two-rowed barley.

3. Barley. This is barley which does not meet the requirements for any of the classes of six-rowed barley or two-rowed barley.

The subclasses of six-rowed malting barley and six-rowed blue malting barley are shown in Table 18 and have nine grading factors: test weight, suitable malting type, sound barley, damaged kernels, foreign material, other grain, skinned and broken kernels, thin barley, and black barley. Grade characteristics for the subclass two-rowed malting barley are shown in Table 19 and have eight factors: test weight, suitable malting type, sound barley, wild oats, foreign material, skinned and broken kernels, thin barley, and black barley. The subclasses of six-rowed barley, two-rowed barley, and the class barley have eight grading factors: test weight, sound barley, damaged kernels, heat damaged kernels (major), foreign material, broken kernels, thin barley, and black barley and are shown in Table 20. Any one of these factors determines the numerical grade. If a sample of six-rowed malting barley is No. 1 on all factors except damaged kernels, then damaged kernels would determine the grade.

There are two basic types of transactions for merchandising barley. The first type is made on a sample basis. Traders are given a detailed inspection report and can examine the barley sample. Barley is identified as to its class, subclass, and grade. In addition, the report lists the measured values of all the grading factors such as the ones listed in Tables 18 through 20. To the trader on the floor, numerical grades are of lesser interest, since visual inspection is possible. In the second type of transaction, the numerical grade is important. These latter transactions are based on warehouse receipts which do not cover a detailed report on quality information like those dealing on a sample basis. Therefore, traders rely on the numerical grade for information concerning barley quality.

TABLE 18. OFFICIAL U.S. GRADE REQUIREMENTS FOR THE SUBCLASSES SIX-ROWED MALTING BARLEY AND SIX-ROWED BLUE MALTING BARLEY, 1978

Grade[a]	Minimum Limits of--			Maximum Limits of--					
	Test Weight Per Bushel	Suitable Malting Type	Sound Barley	Damaged Kernels[b]	Foreign Material	Other Grains	Skinned and Broken Kernels	Thin Barley	Black Barley
	Pounds	percent							
U.S. No. 1...	47.0	95.0	97.0	2.0	1.0	2.0	4.0	7.0	0.5
U.S. No. 2...	45.0	95.0	94.0	3.0	2.0	3.0	6.0	10.0	1.0
U.S. No. 3...	43.0	95.0	90.0	4.0	3.0	5.0	8.0	15.0	2.0

[a]Six-rowed malting barley and six-rowed blue malting barley may contain a maximum of 1.9% of frost-damaged kernels of which not more than 0.4% may be frost-damaged (major), may contain a maximum of 0.2% of heat-damaged kernels of which not more than 0.1% may be heat-damaged kernels (major), and may contain unlimited amounts of mold-damaged kernels (minor); however, mold-damaged kernels (major) shall function as "damaged kernels" and against "sound barley."
[b]Frost-damaged kernels (minor) and mold-damaged kernels (minor) shall not be damaged kernels or scored against sound barley.

SOURCE: The Official United States Standards for Grain. January 1978, p. 3.7.

TABLE 19. OFFICIAL U.S. GRADE REQUIREMENTS FOR THE SUBCLASS TWO-ROWED MALTING BARLEY, 1978

Grade[a]	Minimum Limits of--			Maximum Limits of--				
	Test Weight Per Bushel	Suitable Malting Type	Sound Barley[b]	Wild Oats	Foreign Material	Skinned and Broken Kernels	Thin Barley	Black Barley
	pounds	percent						
Choice...	50.0	97.0	98.0	1.0	0.5	5.0	5.0	0.5
U.S. No. 1...	48.0	97.0	98.0	1.0	0.5	7.0	7.0	0.5
U.S. No. 2...	48.0	95.0	96.0	2.0	1.0	10.0	10.0	1.0
U.S. No. 3...	48.0	95.0	93.0	3.0	2.0	10.0	10.0	2.0

[a]Two-rowed malting may contain a maximum of 1.9% of frost-damaged kernels of which not more than 0.4% may be frost-damaged kernels (major), may contain a maximum of 0.2% of heat-damaged kernels of which not more than 0.1% may be heat-damaged kernels (major), and may contain a maximum of 1.9% of mold-damaged kernels of which not more than 0.4% may be mold-damaged (major).
[b]Frost-damaged kernels (minor) and mold-damaged kernels (minor) shall not be scored against sound barley.

SOURCE: The Official United States Standards for Grain. January 1978, p. 3.8.

TABLE 20. OFFICIAL U.S. GRADE REQUIREMENTS FOR THE SUBCLASSES SIX-ROWED BARLEY, TWO-ROWED BARLEY, AND THE CLASS BARLEY, 1978

Grade	Minimum Limits of--		Maximum Limits of--					
	Test Weight Per Bushel	Sound Barley	Damaged Kernels[a]	Heat Damaged Kernels (Major)	Foreign Material	Broken Kernels	Thin Barley	Black Barley[b]
	Pounds		percent					
U.S. No. 1...	47.0	97.0	2.0	0.2	1.0	4.0	10.0	0.5
U.S. No. 2...	45.0	94.0	4.0	0.3	2.0	8.0	15.0	1.0
U.S. No. 3...	43.0	90.0	6.0	0.5	3.0	12.0	25.0	2.0
U.S. No. 4[c]..	40.0	85.0	8.0	1.0	4.0	18.0	35.0	5.0
U.S. No. 5...	36.0	75.0	10.0	3.0	5.0	28.0	75.0	10.0
U.S. Sample Grade...	Sample grade shall be barley which does not meet the requirements for any of the grades from No. 1 to No. 5, or which contains a quantity of smut so great that one or more of the grade requirements cannot be determined, or which contains more than seven stones or more than two crotalaria seeds (Crotalaria spp) per 1,000 grams of barley; or which is musty, or sour, or heating; or which contains wild brome grasses; or which otherwise is of distinctly low quality.							

[a]Includes heat damaged kernels (major). Frost-damaged kernels (minor) and mold-damaged kernels (minor) shall not be considered as damaged kernels.
[b]These limits do not apply to the class barley.
[c]Barley that is badly stained or materially weathered shall be graded not higher than U.S. No. 4.

SOURCE: The Official United States Standards for Grain. January 1978, p. 3.9.

Canadian Grade Standards for Barley

The grading system in Canada is similar in some respects to that in the United States. It relies on two main determinants. One is the numerical grade factor and the other is the standard of comparison which is prepared each year.[6] The classes for barley consist of six-rowed Canada Western, two-rowed Canada Western, both limited to malting barley varieties, and feed barley. There are two numerical grades for both six-rowed and two-rowed barley and three for feed barley. The requirements for each of these grades are shown in Tables 21 and 22. The Canada Western barley standards indicate a slightly higher test weight requirement for two-rowed barley. In addition to those requirements listed in Tables 21 and 22, minimum and maximum levels are established for plumpness and thinness, respectively. In particular, No. 1 Canada Western barley requires a minimum of 70 percent plump kernels and a maximum of 4 percent thin kernels. The requirements for No. 2 Canada Western barley are a minimum of 60 percent plump kernels and a maximum of 5 percent thin kernels.

[6]The Canadian grade structure for barley has recently been under investigation and proposals for changes are under review. See Canada Grains Council.

Many of the factors listed in the grade standards are subjective and need visual examination to accommodate a consistent evaluation. A "standard" is prepared each year for each grade by the Inspection Division of the Canadian Grain Commission. This standard is used to indicate the minimum quality for the visual inspection. Two standards are prepared. The primary sample is used as a guide in grading grain in the domestic market and represents the minimum requirements of the grades with respect to the visual grading factors. The export sample provides guarantees to traders and importers that shipments during the crop year will be at least equal in quality to the export sample of that grade. Currently, these export samples are prepared only for No. 1 and No. 2 feed barley and are sent around the world to traders and importers.

Transportation and Barley Marketing

United States

The greatest domestic use of barley has been as a feed ingredient. However, in recent years, the quantity used for feed has declined and has been only slightly greater than that used for malting. In 1977, about 75 percent of the feed barley was used on the farm where it was produced (Hill, Leath, and Fuller). Consequently, the majority of barley shipped is for malting purposes. The interstate shipments of all barley are shown in Figure 4. Most of the interstate shipments originate in North Dakota and Minnesota. Major destinations for barley are Minnesota and Wisconsin and states farther east. Shipments from Idaho and Montana are destined mostly to the Pacific Northwest and California. The railroad is the predominant mode of interstate shipments and in 1977 carried 69 percent of the total volume (Hill, Leath, and Fuller, p. 6). Export barley shipments from the originating states through the various ports are shown in Figure 5. The major port for export is Duluth/Superior followed by the Pacific Northwest. The other east and west coast ports are of lesser significance.

The railroad rate structure, as traditionally established, was designed to move barley east. Grain and grain products that are transported by rail have moved under two basic commodity rate structures: flat and proportional. The flat rate is charged for movement between the production region and the terminal market (e.g., Minneapolis) and movement between terminal markets (e.g., Minneapolis and Milwaukee) if the inbound movement was not by rail. If the inbound movement was by rail, the intermarket rate is called a proportional rate, which is applied only on grain between certain major terminal markets. The intermarket proportional rate is generally less than the intermarket flat rate. For example, the rail rate from Fargo to Milwaukee would be the sum of the flat rate to Minneapolis and the proportional rate from Minneapolis to Milwaukee and would be less than the summation of the inbound flat rate and the outbound flat rate. This arrangement of rail rates is important in two respects. First, it has traditionally made barley captive to Minneapolis since it was the rate break point and enhanced Minneapolis as a terminal market. Second, it has given rails an advantage on both the inbound and outbound movements relative to alternative modes. If the shipment to Minneapolis was by truck, it would have a disadvantage on the outbound movement--whether in raw or processed form since the higher intermarket rail rate would apply. These two factors had important implications in the organization of the U.S. barley industry. However, these rail pricing policies were recently changed to make

TABLE 21. GRADES OF CANADIAN BARLEY (CANADA WESTERN)

Grade Name	Standard of Quality				Maximum Limits of Foreign Material			
	Minimum Kilograms per Hectolitre	Variety	Minimum Percentage of Variety or Type	Degree of Soundness	Large Seeds	Wild Oats	Other Cereal Grains	Total Not to Exceed
No. 1 Canada Western Six-Row	62	Any Six-Row variety equal for malting purposes to Conquest	95	Practically sound, reasonably well matured, may contain lightly weather-stained but not badly discoloured kernels	Practically Free	About 0.5%	About 1.5%	About 1.5%
No. 2 Canada Western Six-Row	60	Any Six-Row variety equal for malting purposes to Conquest	90	Reasonably sound, fairly well matured, may contain moderately weather-stained but not severely discoloured kernels	About 1%	About 1%	3%	4%
No. 1 Canada Western Two-Row	63	Any Two-Row variety equal for malting purposes to Betzes	95	Practically sound, reasonably well matured, may contain lightly weather-stained but not badly discoloured kernels	Practically Free	About 0.5%	About 1.5%	About 1.5%
No. 2 Canada Western Two-Row	62	Any Two-Row variety equal for malting purposes to Betzes	90	Reasonably sound, fairly well matured, may contain moderately weather-stained but not severely discoloured kernels	About 1%	About 1%	3%	4%
No. 1 Feed	59	Any variety or type or combination of varieties or types	--	Frosted, weather-stained or otherwise damaged, but sweet, may contain 0.5% heat damage	About 1%	3%	4%	4%
No. 2 Feed	55	Any variety or type or combination of varieties or types	--	Frosted, weather-stained or otherwise damaged, may contain 3% heat damage but shall be reasonably sweet	About 1%	6%	10%	10%
No. 3 Feed	--	Any variety or type or combination of varieties or types	--	Excluded from the preceding grades on account of weight, mixtures or severity of damage, may contain 5% heat damage	About 1%	10%	15%	15%

TABLE 22. GRADING FACTORS FOR BARLEY IN CANADA--MAXIMUM TOLERANCES

Grade	Heated Rotted and Severely Mildewed	Fireburnt	Stones	Ergot	Sclerotinia	Sprouted	Frosted Kernels		Peeled and Broken[a]
							Severe	Lightly	
No. 1 C.W.	Nil	Nil	1K	0.05%	0.01%	Nil	Pract. Free	5%	4%
No. 2 C.W.	0.1%	Nil	2K	0.1%	0.01%	0.5%	2%	5%	5%
No. 1 Feed	0.5%	Nil	5K	0.25%	0.01%	10%	NO LIMIT		Broken 15%
No. 2 Feed	3%	Nil	5K	0.25%	0.01%	20%	NO LIMIT		30%
No. 3 Feed	5%	0.5%	5K	0.25%	0.01%	NO LIMIT	NO LIMIT		50%

NOTE: The letter "K" in these tables refers to kernel size pieces per 500 grams.

[a]Peeled and Broken applies to inspections before or on receipt at terminal elevators. Tolerances ex terminal process and transfer elevators are: 1 C.W. -5%; 2 C.W. -6%.

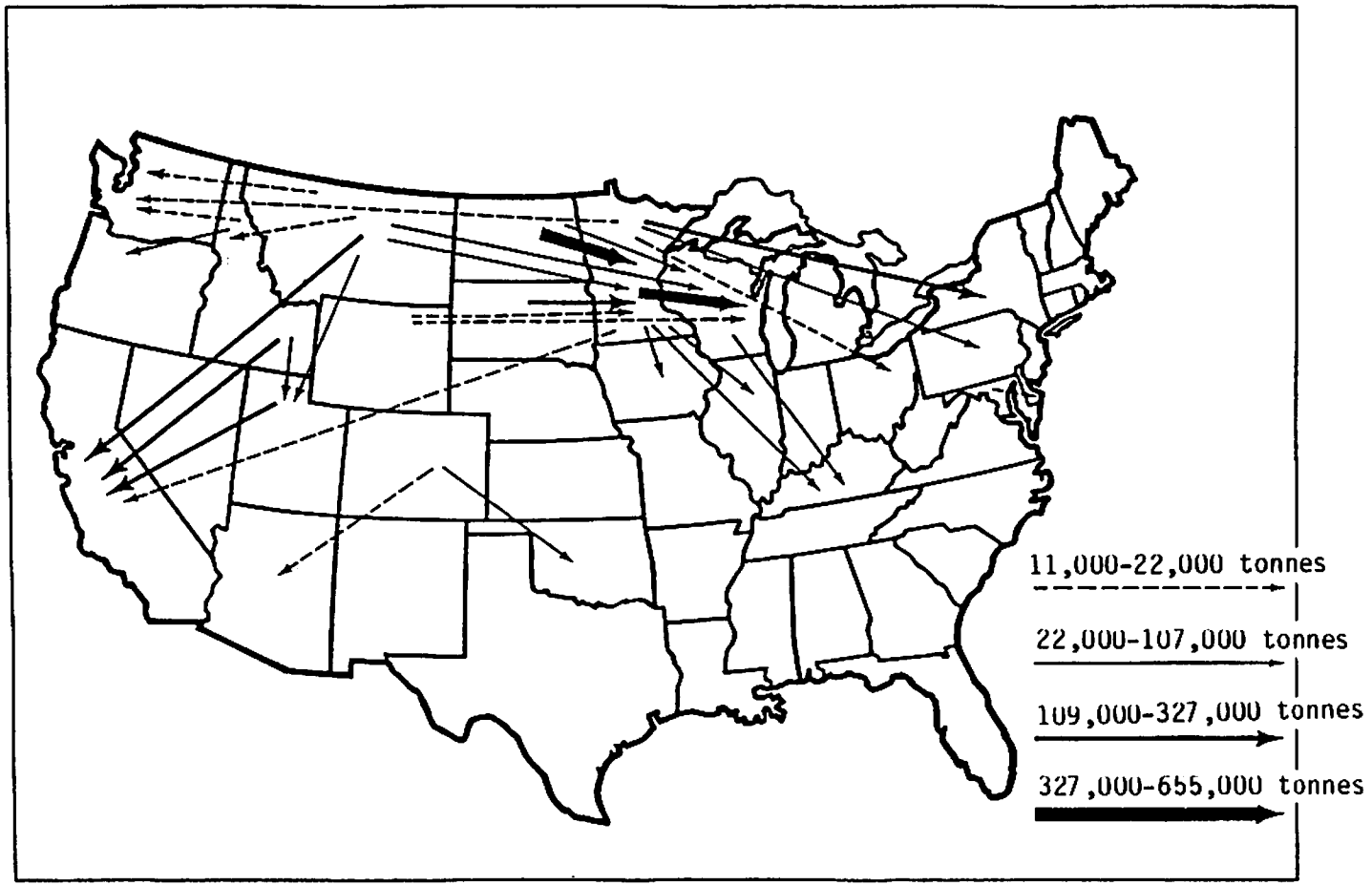

Figure 4. Patterns of Barley Flows to Domestic Destinations in 1977 [Hill, Leath, and Fuller]

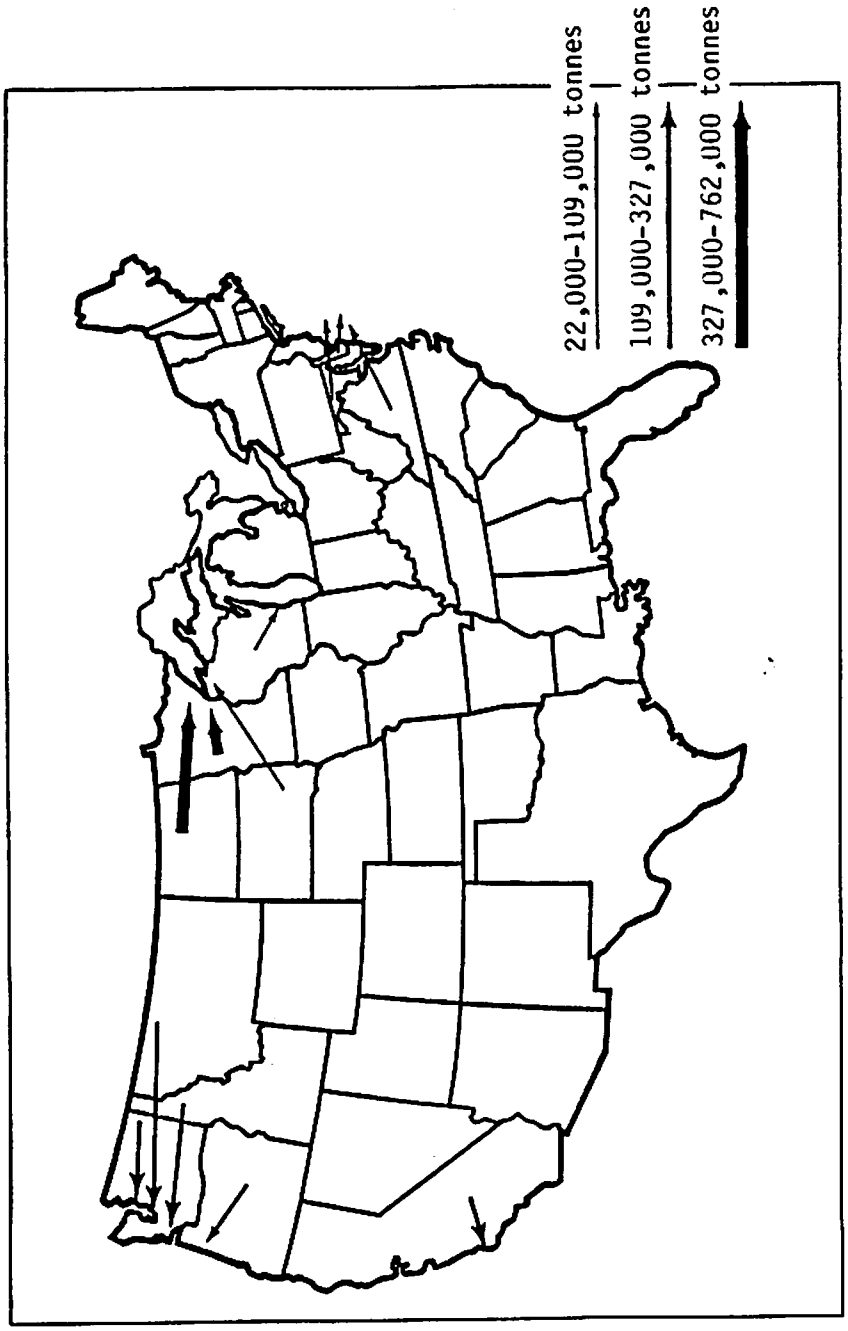

Figure 5. Patterns of Barley Flows to Port Areas in 1977 [Hill, Leath, and Fuller]

outbound shipments eligible for the lower proportional rate, regardless of the inbound mode.

Barley shipments from the producing region have traditionally been dominated by the railroads (Griffin and Casavant) for several reasons. First, the proportional rate structure as discussed above dictates that barley shipped into Minneapolis would have to move by rail if the buyer intended to ship it, or the malt, beyond by rail. Second, if barley is shipped by truck to the terminal market, it precludes an on-track resale of the barley, which is an option that buyers prefer to have available to them. Inbound rail shipments allow the flexibility to easily resell the barley which does not meet the maltsters' specification. Since barley must be dumped shortly after arrival by truck, there is little flexibility to resell or rebill it to another destination. The third and related factor that gives the railroads an advantage in barley shipments is a lack of truck unloading facilities at the malt plants in the Minneapolis area. The result of these factors is the captivity of barley to the railroads in both inbound and outbound movements. Consequently, barley rates between North Dakota and Minneapolis are at a level much greater than those for wheat (wheat and barley rail rates were originally the same).

The rate structure described above largely explains the transportation and organization of the marketing system which exists today. Nonetheless, several changes have been introduced recently that will likely affect the barley marketing system. Historically, barley and malt were charged the same rail rate. In recent rate increases, however, they were treated differently; rates for malt were greater than for barley. This is a divergence from the historical policy of rail rate regulation by the Interstate Commerce Commission. The result of this policy change is an incentive to locate malt plants near the point of consumption, assuming everything else is the same. On the contrary, everything is not the same. Prior to malting, barley is sized (thin kernels removed) and cleaned. During malting, weight losses occur due to respiration, loss of rootlets, and reduction of moisture to about 4 percent. Savings in transportation can occur by locating a malt plant in production areas and shipping malt instead of barley. These savings increase as transportation rates increase. A second recent factor affecting the barley industry is the change in the proportional rate structure as discussed above. A third major change has been the trend toward the deregulation of rail rates. Both the Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Rail Act of 1980 stimulated the trend toward at least partial deregulation of the rail industry. It is premature to elaborate on the effects of deregulation on the barley industry.[7]

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[7]Several effects seem particularly apparent. The potential for shipping barley and/or malt using a contract rate, would allow for a longer term arrangement between the shipper and carrier with respect to the movement. Another potential effect is the use of point-to-point rate making which would allow barley to bypass Minneapolis which is the rate break point. A third effect of deregulation is the increased use of multi-car rates for originating barley. Significant monetary incentives are being introduced to ship grain in greater than single carlots. This is more predominant in other grains than in barley. However, given the incentives, the barley industry will likely have to respond by changing its traditional procurement practices--or pay a transportation and handling premium relative to the alternatives.

Canada

The overall organization of the logistics and transportation system in Canada differs from that in the United States. Two major differences include the allocation of rail cars and the rate level. As discussed previously, the rail cars are allocated by the Grain Transportation Authority in consultation with the Canadian Wheat Board. Cars are allocated in response to demand and to the capacity of the transportation system.

The dominant feature affecting grain transportation in western Canada is the rail rate structure which has not changed since 1925. Freight rates which apply to most grain and grain products in western Canada are called the statutory or Crow's Nest Rates. These are the rates under which barley and malt move and are a result of an agreement between the federal government and the railways. This arrangement has provided western Canada with the lowest grain freight rates of any major competing exporting country. Grain rates in the United States are three or more times higher. Indeed, competitors recognize that this constitutes in effect an export subsidy in the grain export market. The policy enables producers to receive a higher price and/or for barley to be sold at a lower price relative to international competitors.

The government is currently in the process of analyzing alternatives for increasing the rail rate structure. Several implications are apparent. First, export prices will increase and farm prices will decrease relative to the situation prior to the change. Consequently, barley exports will become relatively less competitive. The second effect would be an expansion in processing facilities in or near the production regions.

Barley Using Industries

A brief discussion of the malting and feed industries and the export market for barley will be presented in this section.

Malting

One of the primary uses of barley is to produce malt, an important ingredient in beer. The term malt can be applied to any germinated grain, but nearly all commercial maltsters use barley.[8] The malting process includes steeping, germination, and kilning. Steeping and germination involve immersing graded barley in water to raise the moisture content from about 12 percent to 35-45 percent, which initiates growth. After a few days of germination, kilning, which is a process of drying malt until the moisture content decreases to 4-6 percent, follows. Malt specifications of breweries specify all or part of the malting process such as kiln finishing, temperature, and germination time. The resulting product is called malt, which is similar to barley in appearance and weighs 34 pounds/bushel. The by-products include mostly hulls and sprouts (2.5-6.5 percent) Sprouts are used as a protein supplement in animal feed blends.

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[8]This section is taken largely from Donchek and Sfat.

Most of the malting capacity in the United States is located in the Upper Midwest and Western regions. Malt plants in the United States have historically been located in Wisconsin. Capacity expansion later shifted into Minnesota, which was closer to the production region. Yet, in the past decade, there has been a major shift in location of expanded capacity. Recent expansion in malting capacity has been in barley production areas. At least two reasons account for this. First, one of the faster growing areas of domestic U.S. demand is the West Coast. A malt plant located in the six-rowed malting barley production region has flexibility to be competitive in either Eastern or Western United States. The second reason is that malting is a weight losing process as discussed above.

Estimated malt plant capacity in the United States in 1980 is shown in Figure 6. Wisconsin is the state with the largest malting capacity followed by Minnesota. The figure illustrates that recent and planned expansion in malting capacity has been in barley production areas as opposed to beer consumption areas. Malting plants are located generally throughout Canada with some concentration in eastern Canada. Malting capacity in Canada in 1980 was 570,000 tonnes.

Malting is a highly capital intensive process. By nature of its technology, large-sized plants are required for efficient operation. Most of the newer plants are built with about 100,000 tonnes/year capacity or greater. The newest plant located in North Dakota has an estimated capacity of 216,000 tonnes/year. The recently built plant in Idaho has a capacity of 93,000 tonnes/year and potential for expansion to 186,000 tonnes/year. Capacity of most older plants is typically smaller and may be less than 50,000 tonnes/year.

Feed Grains Industry

The most important use for barley in the United States is for feed. Demand for feed barley reached a peak in 1970 and has since decreased (Table 4). The dominant feedstuffs in the United States are corn and soybean meal. In Canada, feed is by far the most important use of barley. Normally about 40 percent of the barley crop is used as feed domestically. In recent years over 5 million tonnes were fed annually.

Feeds for each type of livestock are formulated to supply energy and protein.[9] Grains (i.e., wheat, corn, oats, milo, and barley) usually supply a large portion of the energy content in feeds. Grain normally supplies about one-half of the total protein content of many livestock rations. Supplemental protein is supplied by oilseed meals. Each type of ingredient contains different nutritional characteristics. These ingredients are blended to produce a feed of required physical form and optimal nutritional value at minimum costs. Optimal utilization of any feed ingredient depends on its nutritional composition, physical properties, and cost--relative to the alternative feed ingredients. If barley prices increase, its use in feed mixes will decrease and other grains will be substituted. If prices decrease, its use in feed mixes will increase.

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[9]Much of this section is taken from Canadian International Grain Institute.

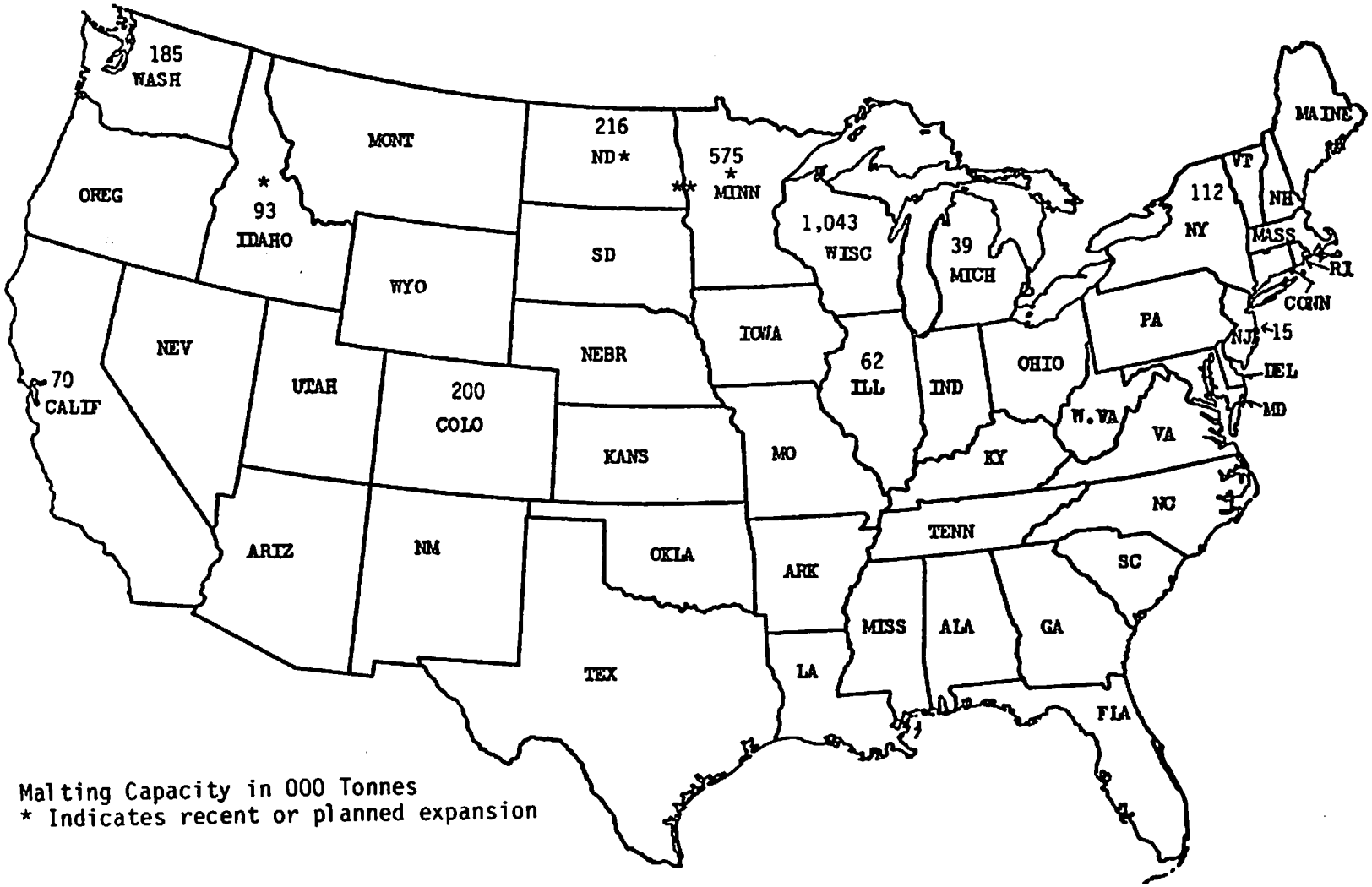

Figure 6. Location of Malting Capacity (1979-1980)

Wheat and corn tend to have higher energy values than grains with hulls such as barley and oats. The digestive process for cattle and sheep, though, is conducive to the efficient utilization of hulled grains such as barley and oats. Barley is particularly suited to meeting the energy requirements of hogs. It is also important in finishing rations for beef cattle since it contributes fiber to satisfy the roughage requirement and at the same time supplies energy necessary to provide sufficient fat tissue for meat tenderness, juiciness, and flavor.

In Canada, barley is more abundant than the other feed grains and, consequently, is the most important basic feed grain. In the United States, corn is plentiful and barley competes with corn as a feed ingredient. In 1969 barley made up 7.5 percent of the total feed grain tonnage utilized by U.S. feed manufacturers.

Exports

Although barley is relatively important as a cash crop in North America, production is small compared to that of the world (Table 23). North America typically produces only 10-13 percent of the world production that has increased steadily from 72 million tonnes in 1959 to 182 million tonnes in 1978. The largest portion of this increase was in the USSR and Europe.

Both Canada and the United States export some barley and malt. Exports are more important in Canada than in the United States, as discussed earlier. One of the more important regions of the world for barley and malt production and also for export shipments is the European Economic Community. Production in the EEC has increased rapidly in recent years largely due to higher yields, which in 1980 were 70 percent greater than in North America. The EEC normally has about 22 percent of the world barley exports and about 56 percent of the world malt exports. Within the EEC, France is the largest producer and exporter.

TABLE 23. WORLD PRODUCTION OF BARLEY BY COUNTRY AND/OR CONTINENT FOR SELECTED YEARS

Continent or Country	Production Year						
	1959	1963	1968	1973	1978	1979	1980
	(000 tonnes)						
North America	14,280	13,823	16,491	19,601	20,628	17,030	19,145
Europe	25,295	34,176	46,211	57,001	71,408	67,490	72,859
Soviet Union	8,272	16,326	24,200	55,044	62,077	47,900	48,600
Asia	17,872	17,740	19,526	16,691	18,378	18,615	18,389
World Total	71,617	88,379	113,200	155,743	181,902	160,053	167,603

SOURCE: USDA Agricultural Statistics.

The growth in exports by the EEC is at least partially due to the Common Agricultural Policy. The overall purpose of this policy is to attain self-sufficiency in food production. A complex mechanism of target, threshold, and intervention prices is used to meet this objective. When production is surplus and domestic EEC prices exceed those in the world market (due to price support), a subsidy for exports of both barley and malt is used to make the EEC price competitive. By progressive increases in the export subsidy, the EEC is able to expand exports. The subsidy, which fluctuates from week to week, has a very important impact on North American barley and malt exports. While Canada has been increasing exports in recent years, the EEC has been expanding its market share. For example, world malt exports doubled between 1968 and 1978. During that period the market share for the EEC increased from 40 to 59 percent.

Conclusion

Barley is an important cash commodity produced in North America. Production in the United States is concentrated in the region extending west from Minnesota, and Canadian production is concentrated in the prairie provinces. Primary demands for barley are feed, malting, and exports as well as some minor uses. In the United States, barley production is used about equally for feed and malting and very little is exported. Most of Canadian barley is used for feed, followed closely by exports. Only about 10 percent of Canadian barley is purchased for malting.

Producers plant barley in response to expected relative profitability, but they do not have an efficient means to protect themselves from price declines. Producers of Canadian barley also respond to profitability and are subject to certain constraints imposed by the Canadian marketing system. There is essentially a dual marketing system in Canada; one applies to barley sold for export and to domestic maltsters, and the other applies to domestic feed grains. Each has unique attributes which affect the other system. A grading system exists in each country but there are several important nongrade factors (i.e., protein, variety, etc.) that are also important in explaining price differentials. The transportation system has had an important influence on the development of the barley industry. Both countries are currently experiencing changes in transportation policy which may have a significant effect upon the industry in the future.

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