

STATE COLLEGE OF WASHINGTON
AGRICULTURAL EXPERIMENT STATION
PULLMAN, WASHINGTON

Division of Farm Management and
Agricultural Economics

Wheat Exporting from the
Pacific Northwest

by

JOHN B. WATKINS

BULLETIN No. 201
May, 1926

All bulletins of this Station are sent free to citizens of the State on
application to the Director.

Printed by College Printing Department

46599

F6

BOARD OF REGENTS

W. A. Ritz, President Walla Walla, Wash.
 E. O. Holland, (President of the College, Secretary, ex-officio)
 A. D. Dunn Wapato, Wash.
 J. H. Hulbert Mount Vernon, Wash.
 A. W. Davis Spokane, Wash.
 F. J. Wilmer Rosalia, Wash.

EXPERIMENT STATION STAFF

E. O. Holland, Ph. D. President of the College
 Edward C. Johnson, M. A. Director
 L. J. Smith, B. S. Agricultural Engineering
 Howard Hackedorn, B. S. Animal Husbandry
 Jerry Sotola, M. S. Assistant Animal Husbandman
 S. C. Vandecaveye, Ph. D. Bacteriologist
 J. L. St. John, M. S. * Chemist
 J. R. Neller, Ph. D. Acting Chemist
 E. L. Green, B. S. Assistant Chemist
 C. A. Rust, B. S. Assistant Chemist
 E. V. Ellington, B. S. Dairy Husbandry
 J. C. Knott, B. S. Official Testing
 R. L. Webster, Ph. D. Entomology and Zoology
 Anthony Spuler, M. S. Assistant Entomologist
 E. G. Schafer, M. S. Farm Crops
 E. F. Gaines, D. Sc. ** Cerealist, Farm Crops
 O. E. Barbee, M. S. Assistant in Farm Crops
 H. P. Singleton, M. S. Assistant in Crops and Soils,
 Irrigation Branch Station, Prosser
 George Severance, B. S. Farm Management
 Neil W. Johnson, M. S. Assistant in Farm Management
 G. H. Fredell, M. A. Assistant Agricultural Economist
 O. M. Morris, M. S. Horticulture
 W. A. Luce, B. S. *** Assistant Horticulturist
 H. J. Jensen, B. S. Asst. Horticulturist, Prosser
 O. L. Waller, Ph. M. Irrigation Engineering
 F. D. Heald, Ph. D. Plant Pathology
 B. F. Dana, M. S. Assistant Plant Pathologist
 E. E. Honey, M. S. Assistant Plant Pathologist
 John S. Carver, B. S. Poultry Husbandry
 L. W. Cassel, B. S. Assistant in Poultry Husbandry
 F. J. Sievers, M. S. Soils
 Henry Holtz, M. S. Assistant Soil Physicist
 A. F. Heck, M. S. Assistant in Soils
 I. M. Ingham, M. S. Assistant in Crops and Soils,
 Adams Branch Station, Lind, Wash.
 C. C. Wright, B. S. ** Specialist in Irrigation Investigations,
 Irrigation Branch Station, Prosser
 J. W. Kalkus, D. V. S. Veterinary Science, Western Washington
 Experiment Station, Puyallup, Wash.
 H. M. Wanser, M. S. Act. Supt. Adams Branch Station, Lind
 C. E. Hill, B. S. ** In charge Waterville Branch Station, Waterville
 R. P. Bean, B. S. ** Supt. Irrigation Branch Station, Prosser
 D. J. Crowley, B. S. Specialist in Cranberry Investigations,
 Cranberry Investigations Laboratory, Long Beach

*On leave of absence.

**In cooperation with the United States Department of Agriculture.

***In cooperation with Chelan County.

TABLE OF CONTENTS

Summary

Introduction

The Region Included in this Study

The Marketing of Pacific Northwest Wheat and Flour 1825-1900

The Pioneer Period 1825-1868

The Period of 1868-1900, Wheat

The Period of 1868-1900, Flour

Volume of Business

The Distribution of Pacific Northwest Wheat and Flour

Distribution

The Markets Reached by Water

The Domestic Market for Wheat and Flour

Atlantic Coast Flour Shipments

Flour shipments to the United States Possessions

Hawaii

Philippine Islands

Alaska

Foreign Markets

Europe

South and Central America

British Columbia

Other Countries

Basis of Trade with the Orient and Southern States

Charts and Tables Showing Distribution of the Wheat Crop of the Pacific Northwest since 1900.

The Competitors of the Northwest

Oriental Competition

Foreign Competition in the Flour Trade

Future Trends in Pacific Northwest Wheat Marketing

Domestic Markets

California

The Cotton Belt

Foreign Markets

Europe

The Orient

SUMMARY

The region covered by this investigation includes Washington, Oregon and all of Idaho except that portion of southern Idaho from which the wheat moves east by rail through the Ogden gateway.

The first wheat grown in the Pacific Northwest was raised at Vancouver, Washington, in 1825.

The first record of an outside shipment was a few barrels of flour sent to the Russian fur posts in Alaska in 1836. Small shipments continued in a limited way to Alaska, Hawaii, and the Orient.

The gold rush of California in 1849 developed the first important external market for Pacific Northwest wheat and flour. This was shipped both by water and by pack train.

The development of mining in British Columbia, Montana and southern Idaho during the 50's produced a demand that started the agricultural development of the interior.

The first export shipment of flour was made in 1857, and was destined for Japan.

From 1868 to 1874 1,029,705 barrels of flour were shipped from the Columbia River and were distributed to British Columbia, Europe, Australia, Hawaii, China, Brazil, and San Francisco, over one-third going to San Francisco.

Up until 1868 the majority, if not all, of wheat shipments were in the form of flour.

In 1868 the first full cargo of wheat was shipped to Great Britain from the Columbia River, inaugurating the export trade on wheat from the Pacific Northwest. This wheat export trade from the Columbia River grew from five cargoes in 1870 to 136 cargoes in the year 1897-98.

In 1881 the first cargo of wheat was shipped from Puget Sound by the Balfour-Guthrie Company.

The completion of the N. P. and O. W. R. & N. railroads to the coast in 1883 and the development of their branch lines through the Walla Walla and Palouse territories during the next decade resulted in a rapid increase in the amount of wheat produced and the amount available for external shipments.

Shipments increased rapidly during the latter part of the nineteenth century until by 1900 more than 50% of the crop was shipped out and the markets were world wide. Practically all the present markets for the Pacific Northwest wheat crop had been opened up before 1900.

By 1900 all the major wheat producing areas in the Pacific Northwest had been opened up with the exception of the Twin Falls area, but there was an increase in production from an average of 47,620,000 bushels for the years 1900-1905 to an average of 90,992,000 bushels for the years 1920-1925.

The Commercial Review estimates the local consumption for all purposes during recent years to be about 20,000,000 bushels per annum, leaving an estimated average of about 70,000,000 bushels to ship out of the area.

Since 1900, 50.4 per cent of the total crop has moved out by water.

During the last twenty-five years 38.4 per cent of the total crop, or over two-thirds of the water shipments, has been exported from this region, the balance going to continental ports and the Pacific possessions of the United States.

There has been a growing tendency toward exporting wheat instead of flour, particularly to the Irish and Oriental markets, while flour leads in domestic shipments. Shipments of flour exceeded shipments of wheat for export during the war, but wheat has since regained the lead.

Domestic water shipments averaged 1,322,753 bushels of wheat and 7,699,097 bushels in form of flour during 1900-25.

Foreign exports averaged 26,821,896 bushels of wheat and 14,960,461 bushels in form of flour during 1900-25.

California has always been the Pacific Northwest's best domestic customer. Practically the entire movement is by water to San Francisco and Los Angeles. Shipments to California are stabilizing in late years to about 1,500,000 barrels annually.

Shipments through the Panama Canal, chiefly to the Atlantic ports of the southern states amounted to a little less than 190,000 barrels per annum for the years 1922-24.

These continental ports of the United States are taking about 20% of all flour and from 5 to 10% of all wheat shipped by water.

The Pacific possessions of the United States are now taking about 7% of the total flour of the Pacific Northwest. This business has shown the most steady growth of any market or group of markets with the exception of the Orient.

Foreign markets have taken 38.4% of the total crop during the last 25 years. Europe, particularly the United Kingdom, has taken about two-thirds of the wheat exported, while China and Japan have taken about two-thirds of the flour exported. However, Japan is already taking more wheat than flour and China is increasing wheat imports so that it is entirely possible that in the future China and Japan will be the best customers for both wheat and flour.

Russia was the largest soft wheat producer in direct competition with the Pacific Northwest for the European market, but has been practically out of the market during and since the war. Russian exports for 1922-23 were reported as 14,241 bushels, or only about 10% of the pre-war average.

Competition in the Orient comes from northern China, Manchuria, Siberia, Japan, Canada and Australia. Canadian competition in the Oriental business has been felt only during the past three or four years, due to the recent reduction in freight rates from the middle provinces to Vancouver, B. C. and the development of terminal facilities at Vancouver. Hence, Canada may become a stronger competitor in the future.

The most serious competition in the flour trade comes from the Japanese and Chinese native mills.

WHEAT EXPORTING FROM THE PACIFIC NORTHWEST

by
JOHN B. WATKINS*

Introduction

It has not been until recent times that the agricultural producer or the public as a whole has given much consideration to marketing problems. In no field probably has less study been made of the problems of marketing than in the field of agriculture. The purpose of this particular study is to show where the wheat and flour of the Pacific Northwest has been going in the past, and some of the underlying causes of this distribution, and to describe briefly the competition which Pacific Northwest wheat meets in the world.

In order to accomplish this purpose, first, the early marketing of wheat is described from the time it was first grown at Fort Vancouver, Washington in 1825, just a century ago, up until 1900; second, the marketing of wheat and flour from 1900 until the present is described in much greater detail; third, the competition met in the important foreign and domestic markets is discussed. In conclusion, some of the more important tendencies and factors affecting the exporting of wheat will be summarized to indicate the probable future of the export business.

The Region Included in the Study. Geographically, the Pacific Northwest includes the territory between the southern boundary of Oregon and Idaho, and the Canadian boundary, and from the Pacific Coast to the Continental Divide in Montana and Wyoming. Practically, it includes the three states of Oregon, Washington and Idaho. Owing to the rail rate structure the territory in southern Idaho from approximately Nampa eastward is a separate marketing unit from the

* Formerly Assistant Professor of Economics, State College of Washington.

rest of the area. Grain from this territory moves eastward by rail to the Ogden gateway, and from there either goes into southeastern United States or west and southwest to California, while the wheat from the rest of the area included in the above definition goes almost entirely to the north Pacific Coast to find an outlet. Since the latter region includes all of the states of Washington and Oregon, and all of northern Idaho, producing over four-fifths of the total wheat crop in the Pacific Northwest, it is this area that will be considered.

The Marketing of Pacific Northwest Wheat and Flour 1825 - 1900

The Pioneer Period—1825-1868. So far as is known, the first wheat was raised at Fort Vancouver, Washington in the year 1825, by Dr. John MacLaughlin, factor at that post for the Hudson Bay Company. From there production soon spread to the lower Willamette Valley, and to the other fur trading and mission posts in this region. Within three years enough wheat was raised at Fort Vancouver to supply the entire need of that post, and eleven years later (1836) the first record of a shipment of wheat or flour from the Pacific Northwest is found. This shipment was in the form of flour, and was made from Fort Vancouver in the steamship "Beaver", which was the first steamboat on the Pacific. This boat stopped at Fort Vancouver on its way to trade with the Russian fur posts in Alaska, and took on a few barrels of flour, presumably to be used as an article in trade. From this time on small shipments are supposed to have been made more or less regularly in trading vessels destined for Alaska, the Orient, and the Hawaiian Islands. This trade, however, was limited in extent and was soon eclipsed by the trade with California.

The California gold rush of 1849 furnished the first important external market for the Oregon country, as the Pacific Northwest was then called. California at that time could not supply the needs of its mining population for bread stuffs, so that considerable quantities of flour were shipped both by water to San Francisco from the Columbia, and by pack train over the Siskiyou and Klamath mountains to the northern California mining camps.

Up until 1850 settlement in the Oregon territory was practically confined to the intermountain valley west of the Cascades. During the 50's the discovery of gold in British Columbia and in Montana started the agricultural development of the interior, and wheat production showed a marked increase around Fort Colville, north of Spokane. The market for the product was the nearby mining camps. The development of the mining camps around Boise and in the Salmon and Clearwater River country greatly stimulated production in the Walla Walla-Pendleton territory, and also around Lewiston and Nampa, Idaho.

It should be observed that production of wheat in the interior came with the development of a nearby market. There were no railroads in those days, and the falls in the Columbia in the region of "The Dalles" hindered free river navigation, so that there was practically no shipping to tide water. The market for the Willamette country was still confined to California, and the small trade with Alaska, the Orient and the Hawaiian Islands, at the close of the pioneer period in 1868. It should also be noted that the majority of shipments, if not all, went forward in the form of flour up to this time.

The Period 1868-1900, Wheat From this point on, for the sake of clarity, it will be necessary to separate the discussion into two parts, viz. that concerning wheat and that concerning flour. The first to be dealt with is wheat shipments.

The repeal of the Corn Laws in Great Britain in 1844 had definitely placed that country on an importing basis for food products. By 1868 the English demand had become sufficiently great to warrant the export of a full cargo of wheat from the Columbia River to Great Britain. This cargo, shipped in the Helen Angier, inaugurated the export trade in wheat from the Pacific Northwest. It was thirteen years later, or in 1881, that the first cargo was shipped from Puget Sound. The shipment was made by Balfour, Guthrie and Company, who had established an office in Portland in 1877, and are still one of the leading exporters of the region.

The grain shipments were made in cargo lots from the very start, though, of course, the size of a full cargo was but a fraction

of the present size of a cargo. The growth of the export trade has been consistent and steady. Five vessels cleared from the Columbia River in 1870, eighty-one in 1877, and in 1897-98 one hundred thirty-six vessels, the record until recently, were required to handle the export business. The decrease in the number of vessels in the grain fleet after 1897-98 was due to the increase in the size of the vessels used, rather than to a decrease in business. The history of the export business from Puget Sound is similar to that of the Columbia River, except that for the most part it has been of smaller volume than the Columbia River business. Puget Sound has specialized in flour rather than wheat and has led in flour shipments from very early times, although in the last year or so the Columbia River flour shipments have been increasing rapidly.

The growth of the export business is closely linked with the development of interior transportation. Both the Oregon Railway and Navigation Company and the Northern Pacific completed their coast lines in 1883 and the following decade saw the development of the railway net through the Walla Walla and Palouse territories, with the result that far more wheat was raised in the interior than west of the Cascades. It is interesting to note that the Northern Pacific, when it opened its line, expected to haul the grain from this interior country to Duluth and made a rate of \$8.00 per ton, or 40c per hundred.¹ This did not please the Portland interests and they succeeded in getting the Oregon Railway and Navigation Company (later the O. W. R. & N.) to reverse the rate policy, the rate in 1887 being 30c per hundred from Walla Walla to Portland.² This forced the Northern Pacific to change its policy and since then the railroad rates have never been such as to encourage shipment eastward.

The Period of 1868-1900, Flour. Flour exporting from the Pacific Northwest began in 1857. The first shipment was destined for Japan, the carrier being the Herman C. Leonard. The following figures give the total flour shipments from the Columbia River from 1868 to 1874.³

¹ Annual Report of the Northern Pacific, 1888, page 66, also Annual Report of Vice President and General Manager to the President and Board of Directors of the Northern Pacific, June 30, 1886, page 66.

² Milton Evans. The Oregon Railway and Navigation Company, December 8, 1887, I. C. C. R.

³ "Economic Resources of the Pacific Northwest." Lewis and Miller. Page 363.

Destination	Barrels
British Columbia	97,475
Great Britain and Europe	91,636
Australia	1,185
Sandwich Islands (Hawaii)	8,674
China	46,050
Brazil	5,436
San Francisco	779,249
Total	1,029,705

These figures are interesting in that they show shipments in practically all directions even at this early date. The Brazilian market has not been retained, while Australia and British Columbia have become very irregular customers.

Detailed figures are very hard to get prior to 1900, particularly figures relative to the destination of shipments. The best single source, the Commercial Review of Portland, Oregon, did not start publishing detailed statistics until about the end of the century. Such data as are available show that Europe, (particularly the United Kingdom) was the largest customer for both wheat and flour during the last two decades of the nineteenth century. The wheat shipments went primarily to England, while the flour went to Ireland. The Irish flour business declined quite rapidly toward the close of the century, due to the development of mills in that country. The explanation seems to be in the desire to develop local brands for local uses in each territory as soon as the population goes over to a wheat standard of diet sufficiently to warrant the development of a local milling industry. A second reason is that wheat is somewhat easier to ship and less perishable than flour, and the by-products are important for animal foods.

The Centennial Milling Company, through the efforts of Samuel Glasgow, started a lively trade in flour with Siberia early in the nineties, which lasted until the Russo-Japanese War. The flour trade with the Orient, particularly Japan, also increased rapidly. Still the most important consumer of the Pacific Northwest wheat and flour was unquestionably the United Kingdom, and it is

interesting to note in this connection that the leading exporting firms had close English connections.

California developed rapidly as a wheat producing district during this period, but this does not appear to have retarded greatly the growth of either wheat or flour shipments from the Northwest. This was due to the earlier development of San Francisco as an exporting center, so that unquestionably much of the grain and flour shipped from the Northwest to California was reshipped to foreign markets.

Table No. 1
Wheat and Flour Exports from the Pacific Northwest, 1881-1892

WHEAT				
Years	Domestic Centals* (1)	Foreign Centals (2)	Total Centals (3)	
1881-1882	3,704,992	487,899	4,142,819	
1882-1883	1,761,754	362,709	2,124,462	
1883-1884	2,276,809	311,941	2,588,750	
1884-1885	3,147,902	521,843	3,669,736	
1885-1886	3,971,856	1,349,740	5,321,596	
1886-1887	3,042,316	711,872	3,754,188	
1887-1888	3,203,108	1,259,283	4,462,371	
1888-1889	2,689,986	559,953	3,249,939	
1889-1890	1,752,879	343,690	2,096,569	
1890-1891	2,937,653	1,208,968	4,146,641	
1891-1892	3,531,908	997,554	4,529,462	

FLOUR				
Years	Domestic (Bbls.) (4)	Foreign (Bbls.) (5)	Total (Bbls.) (6)	Grand Total Wheat and Flour Bu. (7)
1881-1882	526,008	98,956	629,991	10,569,603
1882-1883	353,829	139,471	493,300	6,186,222
1883-1884	334,534	218,846	553,380	7,323,406
1884-1885	198,208	192,316	390,523	8,563,750
1885-1886	353,869	187,768	541,632	12,372,764
1886-1887	353,773	137,903	521,661	9,356,684
1887-1888	488,456	153,015	644,471	11,231,367
1888-1889	510,875	144,184	655,059	9,014,841
1889-1890	411,751	111,681	523,432	6,269,738
1890-1891	491,185	125,300	616,485	10,515,737
1891-1892	377,711	124,870	502,581	10,718,120

* The Cental equals 112 pounds or 1,867 bushels. The bbl. of flour is equal to 4.5 bushels of grain. The Grand Total, Column 7, has been arrived at by adding columns 3 and 6 reduced to bushels.

Volume of Business. Tables 1 and 2 show the volume of business from 1881 to 1900. The source of these figures is the Commercial Review, which compiled the figures from 1881 to 1892 inclusive, on the basis of total shipments from all northwest ports, distinguishing only between foreign and domestic shipments. From 1892 to 1900 the method of compilation was changed. Shipments from Columbia River and from Puget Sound were separated, but no distinction as to destination was recorded. This is unfortunate for it destroys the continuity of the picture of the development of the foreign and domestic markets, which otherwise would be complete for over forty years.

The unit of sale at this time was different than the one now used, being the Cental of 112 pounds equal to 1.867 bushels. The figures in Table 1 show a large yearly variation, and two distinct cycles in volume of shipments. Starting at the high point in 1881-82 total shipments fell off over four million bushels in 1882-83 then after rising to a new high peak of more than twelve million bushels in 1885-86, declined again to half that amount in 1890, then started up again. It should be noted that the flour business did not increase as rapidly as the wheat business, and that both in wheat and flour, domestic shipments far exceeded foreign shipments. Most of these domestic shipments were for California since there never has been either wheat or flour shipments of any size to the Atlantic seaboard until very recently.

Table 2. Total Waterborne Shipments of Wheat and Flour (Both Domestic and Foreign) from the Pacific Northwest in 1892-1900.

Year	Total Wheat (Centals)	Total Flour (Bbls.)	Total Wheat and Flour (Bu.)
1892 - 1893	5,946,821	605,105	13,825,687
1893 - 1894	6,372,082	732,700	15,198,827
1894 - 1895	8,499,931	791,202	19,426,779
1895 - 1896	5,493,557	1,245,205	15,859,894
1896 - 1897	6,824,715	1,316,859	18,667,608
1897 - 1898	18,798,242	1,552,584	32,747,946
1898 - 1899	10,545,288	1,811,162	27,668,291
1899 - 1900	7,886,800	2,077,488	24,078,451

Table 2 shows total waterborne shipments of wheat and flour and reflects the very rapid increase in production taking place in eastern Washington and Oregon following the development of the railroads.

It may be noted from table 2 that wheat exports continue much the same rhythm as indicated in Table 1, though the average amount moving out by water continues upward. Flour, on the other hand, shows a steady and marked increase with no apparent relation to the fluctuation in wheat exports. This was due presumably to the increase in flour shipments to the Orient, a market which took little or no wheat during this period. Total shipments reflect an amazing growth, reaching a total of nearly thirty-three million bushels in 1897-98. In this period foreign exporting first became of great significance in the problem of marketing the wheat of the Pacific Northwest. From this time on the foreign export business has been of vital significance to the Pacific Northwest farmer, perhaps of greater significance than in any other section in this country. In recent years the percentage of the total exports of wheat and flour of the United States furnished by the Pacific Northwest has considerably exceeded the percentage of the total United States crop grown in this area.

The increasing importance of foreign exports in comparison with domestic consumption is due to large scale production on new rich land producing exceptionally high yields and resulting in greater output per capita and greater percentage of surplus than in most wheat producing regions. The rail rates were too high to ship the grain east, besides, as will be noted later, the type of wheat grown in this region is not the kind or quality the eastern markets of this country demand, so there was no development of that market. The California domestic market did not expand rapidly, and the export business began to be developed directly from the Northwest ports, which also tended to increase the foreign business of the region.

Thus far two periods in the development of the markets for the wheat grown in the Pacific Northwest have been briefly summarized. The early or pioneer period extended approximately from 1825-1868. During this period, while there were consistent external

shipments by water, the bulk of the crop was consumed at home. In the second period, lasting from 1868 to 1900, external shipments became increasingly large and before the end of the century more of the crop was shipped out than was consumed at home. The external markets reached, either regularly or frequently, were world wide, and it may well be said that the present markets for the distribution of the wheat crop had been developed before 1900 though the volume of shipment and the relative percents of exports and of production have changed.

**The Distribution of Pacific Northwest Wheat and Flour
July 1, 1900 to July 1, 1925**

Beginning with 1900 complete figures are available for the production of wheat and for water shipments of wheat and flour for the Pacific Northwest.

By the beginning of the century all of the major wheat producing areas in Oregon, Washington and Idaho were well developed with the exception of the southern Idaho region around Twin Falls. Production in Oregon remained practically stationary, in fact, even declined somewhat from 1900 to about 1914. Production in Washington and the Palouse area extending into northern Idaho increased steadily, but the boom period was over. The southern Idaho crop increased the most rapidly from 1910 to 1914, as the figures given below indicate. The total average crop in Oregon, Washington and Idaho by 5 year periods from 1900-1925 was as follows:

1900—1905	47,620,000 Bushels
1905—1910	56,472,000 Bushels
1910—1915	77,181,000 Bushels
1915—1920	73,866,000 Bushels
1920—1925	90,992,000 Bushels

The average for 1915 to 1920 does not reflect quite the true status of affairs. The crops of 1917, 1918 and 1919, were exceptionally short so that the apparent increase in 1920 to 1925 does not represent a post war increase in acreage, but rather a return to normal yields for the acreage planted.

Distribution. Table 3 shows the distribution of the crop by percentage on the basis of 5 year periods. These figures are for water distribution only, so that they do not reflect the total percentage of the crop which moves out of the area. As stated in the introduction, the crop from southern Idaho east of the Nampa district moves eastward by rail to the Ogden gateway rather than west to the Pacific Coast ports. There are no figures available to show the extent of this movement, but it is doubtful whether more than 25 per cent of the total crop of the Pacific Northwest is consumed within the area. The Commercial Review has of late years estimated local consumption for all purposes in the territory tributary to the Pacific Coast ports as 20,000,000 bushels which would be about the percentage indicated above. In only four years since 1900, namely, 1904-05, 1915-16, 1916-17, 1917-18, has much of the crop of Washington, Oregon and northern Idaho moved eastward by rail, shipments for these years being 17,958,000 bushels, 18,432,000, 40,431,000 bushels and 12,858,000 bushels respectively. The explanation for the first year mentioned is that there was a short crop in the winter wheat area of the Corn Belt states which normally supply the southeastern states, and the explanation of the last three years mentioned lies in the shortage of ocean tonnage on the Pacific due to the World War conditions. Figures taken from the Commercial Review for rail shipments eastward from terminal points indicate that with the exception of these four years less than 3 per cent of the crop of Oregon and Washington moves by rail eastward out of the area.

Table 3. Distribution of Water Shipments of Pacific Northwest Wheat Crop in Per Cent by 5-Year Periods, 1900—1925.

5 year average	Total crop moving out by water in %	Retained or shipped east by rail in %	Total crop shipped as flour in %	Total crop shipped as wheat in %	Total crop exported in %	Total crop moving to domestic parts in %
1905-10	54.2	45.8	21.5	32.7	35.4	18.6
1910-15	47.0	53.0	21.5	25.5	31.1	15.9
1915-20	36.6	63.4	28.0	08.6	26.2	10.4
1920-25	55.8	44.2	24.9	30.9	47.2	08.6
25-year average	50.4	49.6	24.9	26.4	38.4	12.0
20-year average omitting 1915-20	53.9	46.1	23.0	30.9	41.4	12.5

Table 3 divides the water shipments in two ways, first into wheat and flour shipments, second, into foreign exports and domestic shipments. In each of the five year periods, except the war period of 1915 to 1920, the total water shipments of wheat materially exceeded those of flour. During the war period flour was the more economical unit to ship. Export shipments of wheat and flour during the twenty-five year period were over three times as great as the domestic shipments by water. It is very doubtful if the rail shipments added to domestic shipments would reveal exports. This means that more than half of all the crop leaving the Pacific Northwest for consumption is exportable surplus. This fact emphasizes the dependence of the Pacific Northwest wheat farmer on world markets and world market conditions. He is subject to conditions over which neither he nor the dealers of the region have any control. Furthermore, during the last twenty-five years the actual exports of this region have amounted to 38.4 per cent of the total crop as compared to not more than 25 per cent of the total United States crop exported, which indicates that the wheat growers of the Northwest are more dependent upon export markets than are the wheat growers of the United States as a whole. As will be explained later, the kind of wheat grown in this area does not produce the kind of flour used in the industrial regions in the Lake States and the north Atlantic Seaboard, so that it is entirely possible that this will be the last great exporting region in the United States.

Table 7 gives in bushels the trends expressed in per cent in table 3. The average amount shipped by water increased between 1905 and 1910, and declined between 1910 and 1915. The reason for the further decline between 1915 to 1920 has already been explained as the heavy rail shipments during the war years. The last five years show the heaviest water shipment of any of the five-year periods. The most interesting trend shown in this table is toward flour shipments in the domestic market. The California wheat crop started to decline rapidly soon after 1900. For a time the California mills brought in wheat to supply the local deficiency, but soon there was a tendency apparently to mill the wheat in the Northwest and ship the flour, rather than ship the wheat. This tendency has increased very rapidly ever since 1910. The liberalizing

of the privilege granted by the railroads of this region for the milling of wheat in transit has helped to accelerate this movement. The relative per cent of wheat and flour in export shipments has been quite irregular. During the war the per cent of flour increased very markedly but since the war wheat has regained the lead.

The Markets Reached by Water. For convenience the markets which the Pacific Northwest wheat and flour enter are grouped under three headings, (1) Continental United States Markets; (2) United States Possessions, including Alaska; and (3) foreign markets. Wheat goes to the second group in such negligible quantities that it has been included under domestic shipments in Table 5. The division is on a purely political and not on a geographic basis. As usually published in the local trade papers of this region, the figures for the Philippine Islands are included under Oriental shipments while British Columbia is included as a part of domestic Pacific Coast figures. So far as trade organization is concerned this is probably more correct than the classification used here. Of late years flour shipments to Manila have been of sufficient importance to make some material difference in figures for the export business, but British Columbia has never been a large enough market to make any significant difference regardless of how it is grouped

The Domestic Market for Wheat and Flour. California has always been the Pacific Northwest's best domestic customer. Practically the entire movement is by water to San Francisco and Los Angeles, very little going by rail. The California trade demands a high gluten flour similar to that used in the territory of the upper Mississippi Valley and North Atlantic States, and this has led to the importation of considerable quantities of hard spring wheat from eastern Montana to mix with the soft wheats of the Pacific Northwest. Here again the absence of statistics relative to rail shipments makes it impossible to estimate the quantity brought in, but it is sufficient to cause the railroads to grant through rail and water rates via Puget Sound ports and Portland, with milling privilege in transit. Wheat has never moved by water to any other continental United States markets in sufficiently large quantities to assume any importance.

Flour shipments to California have shown a tendency to increase ever since 1900—though the yearly figures vary considerably. It appears highly probable that flour shipments are stabilizing for the time being at about 1,500,000 barrels annually. This would indicate that the California market has been pretty well developed, and that future increases will depend upon an increasing population in that state.

The figures for wheat shipments labeled "Other Domestic" in Table 5, are small shipments to the Hawaiian Islands and the Philippine Islands. Total domestic wheat shipments reached their peak in 1912-13. There was a slight tendency toward increasing wheat shipments in 1922-23 and in 1923-24, but it was so relatively small that it had very little real significance.

Atlantic Coast Flour Shipments. In the first year that the Panama Canal was open and since 1920, there have been some shipments of flour to the Atlantic ports, chiefly to ports of the southern states. These shipments amounted to a little less than 190,000 barrels per annum for the two years 1922-1924 and about 120,000 barrels for 1925.

Flour Shipments to the United States' Possessions

Hawaii. The gaps in the figures for flour shipments to the Hawaiian Islands and Philippine Islands, are due to the fact that uniform classification was not used by the Commercial Review. In some years the figures were given in summary form and in others by ports of destination.

From 1900 to 1913 the Hawaiian market steadily grew. In 1913-14, 1914-15, and since 1919, the Hawaiian flour market appears to be stabilizing at around 100,000 barrels annually. This indicates as in the case of California, that future growth depends upon growth in population in this territory.

Philippine Islands. The Philippine market appears to be growing. This is due to the native population changing from a rice to a wheat standard of diet as a result of the economic development of the Islands during the past twenty years. There is probably a definite limit to the annual normal capacity of this market, but so

far it has not been reached, and there is no way of gauging what the future capacity will be.

Alaska. Figures for Alaska are not available probably because until recently the buyer has come to Seattle and purchased his flour supply there, in which case the sales would be treated as domestic sales.

Foreign Markets. The foreign business when viewed from the standpoint of total volume, has been fairly constant in its growth, but when viewed in detail shows marked irregularities. This is more true than in any other group of markets.

Siberia, prominently mentioned as a user of Pacific Northwest flour from about 1891, took 165,186 barrels in 1900-01 (see table 6), and over 200,000 in 1901-02, after which exports declined for two years. On account of the Russo-Japanese war there were no exports in 1904-05, but the next year exports of flour to Siberia were the largest that have ever been recorded. Since that time the Siberian business has been of very small significance to this region.

The peak of flour exports to Japan was reached in 1903-04 when just a little over 1,400,000 barrels were shipped. For the next three years exports of flour remained practically stationary at about 1,250,000 barrels, and then dwindled rapidly. In 1922-23 the Japanese took 217,701 barrels, the most since 1913-14, but for the past two years the volume has been falling off again. Wheat exports to Japan, on the other hand, have shown a steady upward tendency down to the present time. Although wheat shipments have fluctuated greatly from year to year, recently they are far greater than before the war. Japan started to build flour mills about 1907, and the disturbed trade conditions from 1914-19 gave them an excellent opportunity to capture the local flour market, and for a time to control the eastern Asia market. The Japanese mills do not seem able, however, to retain their grip on the eastern Asia markets. While some wheat is grown in Japan as an in-between crop with rice, it is not sufficient to supply the domestic demand, so that as flour milling has grown, wheat imports have increased. It will be noted that the history of the Japanese trade closely parallels that of the Irish trade ten years earlier

There are some signs that the Chinese trade is in a similar course of development. China, particularly Hong Kong, was taking a million barrels of flour per annum during the first six years of this century. Hong Kong, of course, is a distributing point for southeastern China, Indo-China, and during the years mentioned for the Philippine Islands. Recently Shanghai, the port for middle China, is taking more of both wheat and flour than Hong Kong. From 1921-24 China took more flour than ever before, and in 1923-24, more wheat as well. In fact, the Chinese importers over-purchased in 1923-24, so that by May, 1924 shipments practically ceased, and while there have been some flour shipments since, there have been no wheat shipments, the Chinese mills being overstocked. The marked increase in the price of wheat probably also had much to do with the decreased demand for wheat.

Several native mills have been established at Shanghai and northern Chinese ports, strictly modern in construction and equipment, and it is likely that their competition will be felt from now on. In Table 6 the column labeled "Other Oriental" should be interpreted as including Japanese and Chinese shipments when the latter are not shown separately. In other years this column includes shipments to the Dutch East Indies, India, and Indo-China.

Europe. With the exception of 1923-24 Europe has been the largest customer for the wheat of the Pacific Northwest (see table 6). Prior to the war for several years shipments from the Pacific Northwest to Europe averaged about 8,000,000 bushels per annum. While Europe probably will remain an important customer for many years, it is entirely possible that relatively speaking it will not be as important as formerly, particularly if the Chinese and Japanese market increases in size.

The only period when Europe has been a large flour customer was during the World War, and shipments have again fallen off to about the pre-war level. The low point of European flour shipments was reached in 1911-12 when only 4,375 barrels were sent.

The Exports to South and Central America are exclusively to the west coast, including Peru, northern Chili, and western Mexico. Lack of direct communication facilities with the east coast and the

greater cost of transportation via Cape Horn as compared to the cost from Atlantic ports have kept the Northwest millers out of the Brazilian market even though Brazil does grant a 20 per cent preference on American flour. So far little effort has been made to get into the market even though there is now a direct line to Brazil via the Panama Canal. It appears as though the Northwest flour exporters are willing to let the eastern millers have Brazil as long as they keep out of the Orient.

British Columbia has been a small and irregular customer for for both wheat and flour, but now that Vancouver is receiving the western Canadian wheat, it seems likely that the trade will practically disappear.

Other Countries. One of the most peculiar things shown in this table is that the trade during the early years with South Africa was more important than the trade with South America. This reached its height during the Boer War, but with the increase in production of wheat in South Africa, this market has disappeared, except for occasional years.

The miscellaneous shipments include a few shipments to Australia, New Zealand and India in years of short crops in these regions. The other items are not specified so no information can be given relative to them.

Basis of Trade with the Orient and the Southern States. In several instances attention has been called to the absence of wheat shipments to the northeastern part of this country. The chief reason for the absence of such shipments is also the principal reason for the development of business with the Orient and the Southern States, and lies in the type of wheat produced in the Pacific Northwest, which is mainly high starch wheat, producing excellent pastry flour, but poor bread flour. As noted previously, local millers are importing considerable quantities of hard spring wheat from eastern Montana to use in making flour for the California trade.

The South uses large quantities of pastry flour and particularly flour for making hot biscuits. These flours are known as the "Missouri" flours in the southern trade, and have heretofore come mostly from the winter wheat belt of Missouri, Illinois, Indiana and

Ohio. Northwest flours could not compete in normal years as long as they had to move by rail. Now that the Panama Canal is open, Pacific Northwest flour is competing regularly in the southern market. To date this is the most striking effect that the Panama Canal has had on flour and wheat distribution from the Pacific Northwest.

It is the starchy character of the wheat and flour of the Pacific Northwest that keeps it out of the Northeastern States, for north of the Mason-Dixon line the demand is predominately for a high gluten flour made from hard wheats. As long as this is the character of the demand, it is improbable that the Pacific Coast millers can develop a market in the northeastern states even if they could compete with Minneapolis, Kansas City, and other eastern milling centers in the matter of freight costs.

The bulk of the Oriental population is still on a rice basis, though it is affirmed that the merchant and upper classes, as they become more familiar with Occidental ways, are going over to a wheat standard. But all the population use some wheat as a supplementary item of diet in the form of noodles and fancy pastry for fete occasions. They do not use yeast, so that the cooked product is unleavened.

For this type of cooking a high starch flour gives a flaky product that can be softened if used with soup or otherwise moistened, while a high gluten flour turns out a product which one person described as "a cross between a rock and a piece of rubber", in other words, unchewable, if not indigestible.

Since the Occidental trade seems to prefer low gluten types of wheat it would seem that the Pacific Northwest has little to fear from Canadian competition because Canadian wheat has a very high gluten content, yet the orientals seem to attach so great importance to the price that they may begin to use more largely of the high gluten wheats if they can be secured at less cost. This opinion has been expressed by some millers who were interviewed.

In one way the peculiarities of these two markets is a boon to the Pacific Northwest, for otherwise much larger quantities of hard wheat would have to be brought in, or if that were too expensive,

the Northwest wheat crop would have to move in bulk to any market which could use it, and this would almost limit the market to Northwest Europe. While Northwest Europe is a large market it could scarcely absorb at a price satisfactory to the producer the entire exportable surplus of the Pacific Northwest in normal years.

Charts and Tables Showing Distribution of the Wheat Crop of the Pacific Northwest Since 1900

In the following section six charts and four tables are presented in support of the discussion in the preceding section. Figure 1 shows first, the total crop of Washington, Oregon and Idaho; second, the distribution of this crop, so far as the facts are available. As noted before, complete figures for rail shipments cannot be procured, but shipments from the terminals have been compiled from time to time and these are indicated.

Figure 2 indicates graphically the trend of the California business toward flour imports rather than wheat imports. Figures 3 and 4 are designed to show the great importance of one regional market in the export business, Europe being the great wheat market, and the Orient, chiefly China, the great flour market. The Oriental figures for Chart IV were arrived at by adding the columns labeled China, Japan, Siberia and Other Oriental in Table 7. Figures 5 and 6 are designed to show the relative importance of wheat and flour shipments in the foreign business and in the total water borne business of the Pacific Northwest. From these two charts it would appear that on the whole, wheat shipments predominate, despite the fact that the reverse is true in the domestic business, including that with the United States Possessions, thus again giving evidence of the importance of the foreign business to this region.

Tables 4, 5, 6 and 7 have been compiled from the annual issues of the Commercial Review of Portland, Oregon. It is believed that these figures are accurate and that the facts brought out by them are substantially correct.

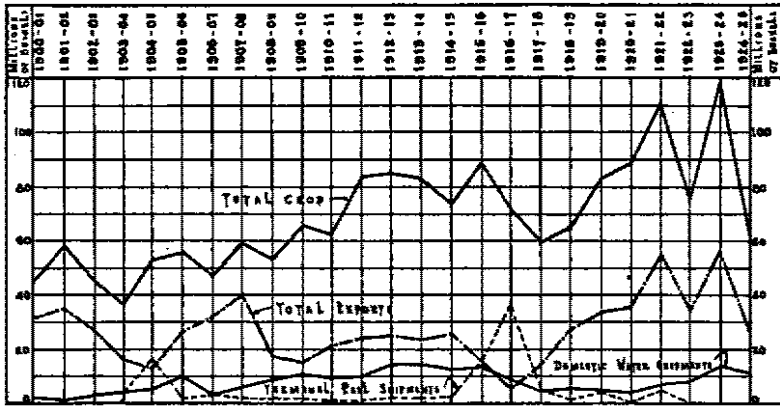


Figure 1
Production and Distribution of Wheat Crop of Washington, Oregon, and Idaho

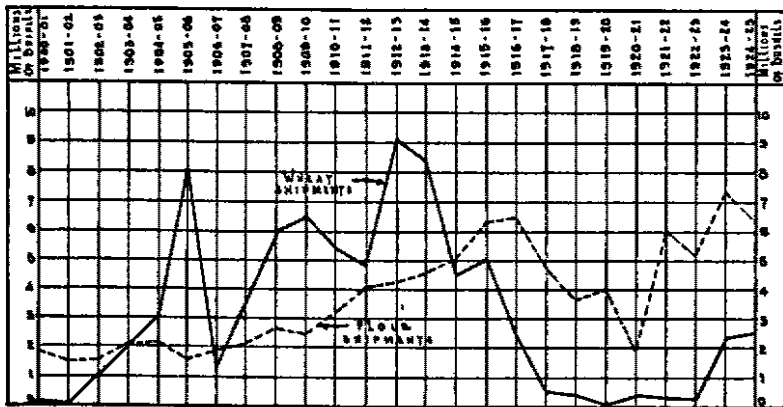


Figure 2
Shipments of Wheat and Flour (reduced to terms of wheat) to California

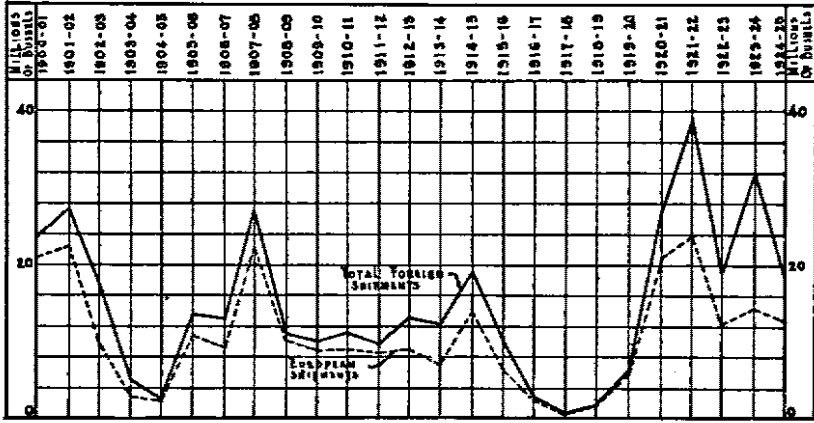


Figure 3
Total Foreign Shipments as Compared to European Shipments

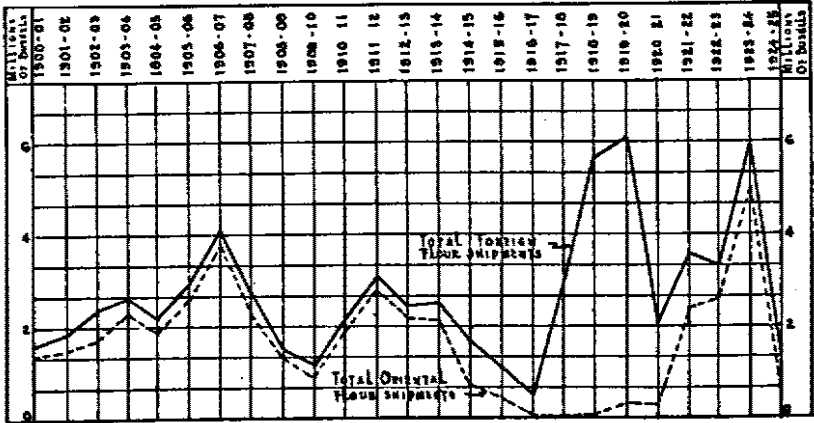


Figure 4
Total Foreign and Total Oriental Flour Shipments From Pacific Northwest, 1900-25.

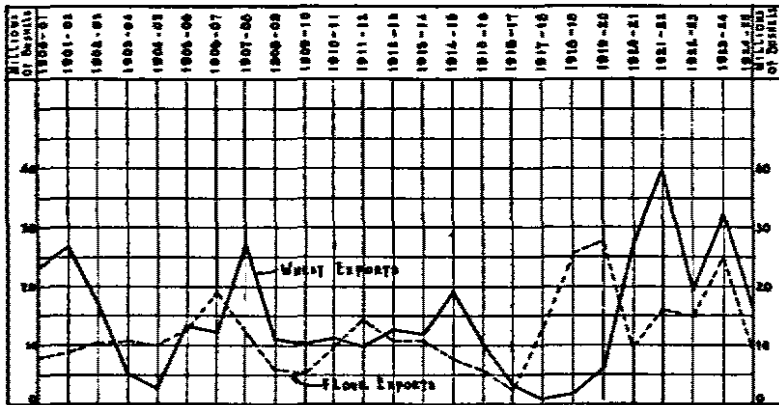


Figure 5
Foreign Exports of Wheat and Flour 1900-25

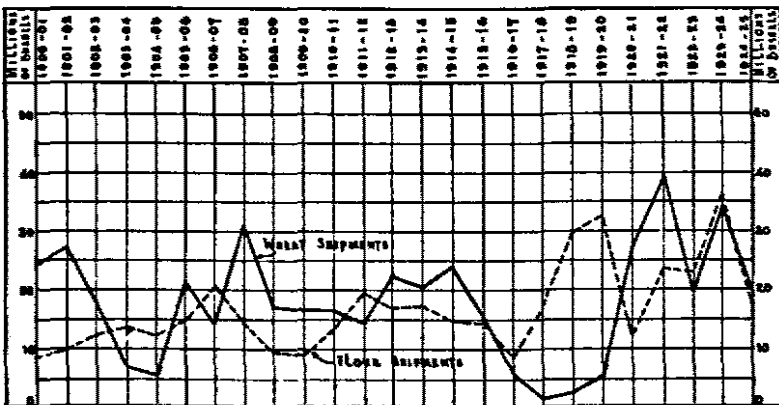


Figure 6
Total Shipments of Wheat and Flour by Water, 1900-25

Table 4. Domestic Shipments of Wheat and Flour by Water, 1900—1925

Year	Wheat (bu., 000 omitted)			Continental U. S. (bu., 000 omitted)			Flour, Bbls. U. S. Possessions					California Flour in terms of wheat
	California	Other Domestic	Total Domestic Wheat	California	Atlantic Ports	Total Cont. U. S.	Hawaiian Islands	Philippine Islands	Alaska	Total U. S. Possessions	Total Domestic	
1900-01	187		187	898,518		898,518	4,451			4,451	898,989	1,793,331
1901-02	10		10	822,828		822,828	8,759			8,759	841,587	1,497,726
1902-03	1,091		1,091	860,055		860,055	19,240			19,240	879,295	1,620,248
1903-04	1,982		1,982	455,028		455,028	21,820	5,492		27,312	482,340	2,047,626
1904-05	3,124		3,124	492,556		492,556	21,541	10,042		31,583	524,139	2,216,502
1905-06	3,172		3,172	365,479		365,479	21,181	18,675		39,856	405,335	1,644,656
1906-07	1,849		1,849	416,047		416,047	27,128	27,110		54,238	470,285	1,872,212
1907-08	3,646		3,646	468,986		468,986	37,812			37,812	468,986	2,110,212
1908-09	6,020		6,020	612,313		612,313		70,169		70,169	612,313	2,757,659
1909-10	6,595		6,595	567,576		567,576		231,308		231,308	799,884	2,554,092
1910-11	5,480		5,480	721,589		721,589		195,932		195,932	917,471	3,246,926
1911-12	4,804		4,804	912,424		912,424		260,032		260,032	1,172,456	4,105,908
1912-13	9,120		9,120	954,561		954,561		324,133		324,133	1,278,694	4,295,625
1913-14	3,479	79	3,558	1,088,384		1,033,384	100,399	195,999		296,398	1,329,782	4,660,228
1914-15	4,527	351	4,878	1,133,076	101,965	1,235,041	106,084	273,127		379,205	1,614,246	5,098,342
1915-16	5,104	158	5,262	1,405,767	32,584	1,438,251	17,515	420,473		437,988	1,876,239	6,325,952
1916-17	2,529	2	2,531	1,444,499	7,409	1,450,908	551			551	1,441,459	6,500,246
1917-18	617		617	908,527		908,527					908,527	4,083,372
1918-19	456		456	839,885		839,885	25,865			25,865	865,700	3,779,258
1919-20	28	32	60	900,410		900,410	96,075		44,150	140,225	1,040,635	4,051,845
1920-21	445	25	469	437,403	149,750	587,153	104,305		22,150	132,955	1,134,441	1,963,327
1921-22	334	53	387	1,347,904	96,232	1,443,136	93,124		21,332	114,456	1,557,642	6,065,568
1922-23	243	49	292	1,158,145	181,129	1,339,274	92,264	354,634	24,933	471,891	1,811,165	5,211,658
1923-24	2,323	331	2,704	1,650,743	133,333	1,787,586	201,443	532,072	26,776	760,291	2,597,877	7,423,366
1924-25	2,551	36	2,787	1,402,002	309,013	1,711,020	106,939	535,325	36,403	679,168	2,390,186	6,309,009

The Competitors of the Northwest

Broadly speaking, Pacific Northwest wheat and flour compete in some one or more of the markets they enter with the wheat from every great producing area of the world. Europe is, of course, the leading consumer of the wheat surplus of the world. However, this market has a quite constant and well balanced consumption, and within reasonable limits is willing to pay the price necessary to secure the proportions of various qualities of wheat that it wants. Thus, while the total amount of the world's crop will have an influence on the general price level, if there is an abundance of hard spring wheat in the European market, and a shortage of soft wheat, a premium will be paid for the soft wheat, or vice versa as the case may be.

Table 5. Foreign Wheat Shipments, 1900-1925
(In bushels, 000 omitted)

Year	Europe	South Africa	South America	Orient Other Than Japan	Japan	British Columbia	Miscellaneous	Total
1900-01	21,188	605	701		19		1,479	23,986
1901-02	22,682	850	545				3,048	27,125
1902-03	9,928	4,152	805		226		2,466	17,077
1903-04	3,432	578			1,091	22		5,103
1904-05	2,583	82	4		183	27		2,764
1905-06	11,023	430	123		2,018			13,688
1906-07	9,118	100	395	2,650	749			13,006
1907-08	22,423	503	477	730	1,822	31	1,459	27,456
1908-09	10,313		249	67			369	11,002
1909-10	8,888		405	112			795	10,150
1910-11	8,887		286		2,136			11,309
1911-12	8,786		255		733	99	189	9,962
1912-13	8,924		205		4,074	78		13,281
1913-14	7,264		22		4,665	107		12,059
1914-15	14,116	1,970	1,002		802	91	1,071	19,059
1915-16	6,453	432	1,953	8		102	1,491	10,342
1916-17	2,846		427			43		3,317
1917-18	759		112					872
1918-19	1,943							1,943
1919-20	6,059			10				6,189
1920-21	24,849	198	673		1,276	50	61	27,107
1921-22	27,709		1,452	1,346	11,945	61	1,462	39,197
1922-23	13,305			739	6,330	31	670	19,015
1923-24	14,487		7	7,557	9,938	17		32,005
1924-25	12,703		8	84	5,398	32		18,225

¹Owing to the rounding of the figures the total will not always agree with the sum of the other columns. The figures are, however, correct as far as given.

Table 6. Foreign Flour Shipments by Barrels, 1900—1925

Year	Europe	South Africa	Japan	China	Siberia	Other Orient	South and Central America	British Columbia	Miscellaneous	Total Foreign	Total Orient
1900-01	116,417	88,837	805,508	928,061	165,188		81,988		5,004	1,611,556	1,388,740
1901-02	51,838	247,049	892,724	877,738	210,031		52,138		21,776	1,858,279	1,480,488
1902-03		432,069	830,353	1,329,574	112,060		78,787	15,752	69,746	2,868,841	1,771,987
1903-04	100,507	79,881	1,428,748	800,782	101,716		52,002		42,634	2,601,265	2,328,241
1904-05	97,500	66,701	1,259,220	666,869			121,758		588	2,212,576	1,926,089
1905-06	10,849	1,148	1,261,888	860,705	451,721		810,718	750	6,288	2,989,052	2,674,809
1906-07	20,000		1,296,878	2,224,719	285,666		262,008		92,261	4,181,082	3,806,768
1907-08	124,547	18,009	567,788	1,438,494	297,608		198,752		117,579	2,762,717	2,298,880
1908-09	47,888		226,450	1,016,870	85,000		108,532		18,879	1,502,619	1,328,820
1909-10	43,696		214,459	687,588	25,000		193,088		20,888	1,184,609	927,042
1910-11	7,085		841,586	1,586,964			235,791		29,588	2,151,109	1,878,500
1911-12	4,375		867,649	1,979,568	3,800		144,788	121,958	81,546	3,153,879	2,851,017
1912-13	80,893		897,845	1,800,826			216,217	54,812	17,675	2,517,768	2,198,671
1913-14	22,338		839,001	1,178,810	132,926		326,660	48,687	21,332	2,571,292	2,150,237
1914-15	741,986	26,789	72,102	10,405	5,715	606,234	222,946	89,380		1,787,008	694,456
1915-16	529,928		87,681	87,586		817,518	491,440	16,775		1,137,566	892,795
1916-17	102,068					186,281	254,127	26,718		519,209	186,281
1917-18	2,915,794					1,816	72,375			2,989,985	1,816
1918-19	5,671,183					80,806	11,975			5,719,464	30,806
1919-20	5,785,983					822,445	57,656	8,175		6,174,269	822,445
1920-21	1,699,870	11,428				804,547	188,741	14,915		2,104,566	304,547
1921-22	983,562				8,500	2,391,833	252,504	24,917	720	3,657,086	2,395,833
1922-23	423,625		217,701	3,376,152			324,342	24,717	2,744	3,869,181	2,593,853
1923-24	188,720		198,222	4,861,935			290,765	21,050		6,011,714	5,000,157
1924-25	558,347		45,588	614,290			206,156	26,782		1,446,108	659,823

Table 7. Total Production and Distribution by Water of Pacific Northwest Wheat Crop, 1900—1925.

Year	Production of Washington Oregon and Idaho Bu.	Total Water Shipments Bu.	Domestic Shipments of Wheat Bu.	Domestic Shipments of Flour Bu. ¹	Total Domestic Shipments by Water	Export of Flour	Export of Wheat	Total Exports
1900-01	44,400,000	38,190,956	186,761	1,813,931	2,000,892	7,262,453	23,988,111	31,190,564
1901-02	57,918,000	37,012,408	10,448	1,537,142	1,547,590	8,839,766	27,135,037	35,464,813
1902-03	45,205,000	30,533,015	1,090,694	1,706,823	2,797,517	10,657,536	17,077,962	27,735,498
1903-04	37,553,000	20,959,159	1,932,132	2,170,530	4,152,662	11,705,694	5,100,303	16,806,497
1904-05	53,024,000	18,193,140	3,123,733	2,348,626	5,472,409	9,956,592	2,764,139	12,730,731
Average 1900-05	47,620,000	27,977,734	1,273,764	1,915,350	3,194,114	9,582,406	15,201,214	24,738,620
1905-06	56,240,000	33,904,606	3,171,702	1,824,009	9,995,711	13,225,737	13,683,168	26,908,895
1906-07	47,523,000	35,236,439	1,846,960	2,116,233	3,465,243	18,314,643	13,006,553	31,321,196
1907-08	56,949,000	45,634,570	3,646,408	2,110,212	5,756,615	12,432,223	27,445,727	39,377,953
1908-09	53,077,000	26,541,933	6,020,329	2,757,493	8,777,822	5,761,735	11,002,333	17,764,113
1909-10	66,622,000	25,671,556	6,595,559	3,597,223	10,192,787	5,323,715	10,150,054	15,473,769
Average 1905-10	53,472,000	34,007,821	5,156,590	2,431,045	7,337,635	11,312,622	13,057,564	26,370,186
1910-11	61,992,000	30,598,072	5,480,013	4,123,620	9,608,632	9,679,991	11,309,449	20,980,440
1911-12	32,247,000	34,233,660	4,303,603	6,276,052	10,079,660	14,191,537	9,932,443	24,154,000
1912-13	34,750,000	39,495,065	9,120,263	5,754,124	14,834,392	11,929,957	13,230,716	24,310,673
1913-14	33,111,000	33,172,363	3,553,401	3,964,020	14,542,421	11,570,315	12,059,132	23,629,947
1914-15	72,306,000	33,005,611	4,377,976	7,251,760	12,129,736	7,316,511	19,059,364	26,375,675
Average 1910-15	77,131,000	36,300,955	6,570,053	6,673,915	12,248,968	10,917,765	13,134,221	24,051,987
1915-16	39,104,000	30,350,531	5,231,519	3,443,096	13,704,615	6,303,591	10,342,375	16,645,956
1916-17	72,256,000	14,331,243	2,531,562	6,645,065	9,177,627	2,336,443	3,317,179	5,659,621
1917-18	59,376,000	19,132,031	317,531	4,133,471	4,303,002	13,454,931	371,093	14,336,029
1918-19	64,690,000	32,220,143	455,600	4,110,650	4,566,250	25,710,539	1,943,307	27,653,846
1919-20	33,402,000	33,707,470	53,530	4,331,353	4,740,433	27,734,135	3,132,337	30,866,472
Average 1915-20	73,366,000	27,043,295	1,734,953	5,014,023	7,398,936	15,117,944	4,531,335	19,649,309
1920-21	33,992,000	40,233,011	409,933	3,240,499	3,710,492	9,470,637	27,106,332	30,577,519
1921-22	110,531,000	33,463,434	337,531	7,421,950	7,809,431	16,453,632	39,197,291	55,653,953
1922-23	75,433,000	42,320,245	292,903	3,149,743	3,442,646	15,161,313	19,016,273	24,177,539
1923-24	113,365,000	70,731,722	2,703,761	11,239,363	14,003,414	24,753,114	32,005,134	56,758,303
1924-25	60,573,000	33,337,323	2,759,571	3,339,335	11,143,206	3,960,530	16,733,337	25,744,417
Average 1920-25	90,922,000	50,304,207	1,322,733	7,699,097	9,021,350	14,960,461	26,321,336	41,732,357
Average 1900-25	69,277,000	35,227,303	3,222,624	4,677,637	7,900,311	12,973,240	14,949,232	27,327,492

¹ 1 Bbl. equals 4.5 bu. of wheat.

On the other hand, the Oriental Market, as has been pointed out, prefers wheat and flour with high starch content, but owing to the low buying power of its population, will take substitutes, or if no substitutes are available, will cease buying. In other words, the European market is relatively inelastic, consuming about the same amount of breadstuffs per annum regardless of price, while the Oriental market is a very elastic market, buying most when prices are the lowest. A comparison of the past two years is a strong illustration of this fact, for Europe took more wheat this past year than it did in 1923-24, while the Oriental demand has been practically nil.

European Competition in Wheat. Russia was the largest soft wheat producer in direct competition with the Pacific Northwest for the European market. During and since the war Russia has been practically out of it. In 1922-23 Russian exports were reported as 14,241,000 bushels as compared to an average from 1908-12 of 142,095,000 bushels; in other words, only about 10 per cent of her pre-war average. It is unfortunate that more facts are not available, but to all appearances there is slight danger of the Russian crop becoming a big factor in the world wheat situation in the near future. Northwest wheat, however, is compelled to meet the competition of practically every other wheat growing region. An exporter pointed out in a personal interview that Pacific Northwest wheat as a rule enjoyed the greatest advantage in the European market at the period immediately following the harvesting season. His argument was that it was possible to ship grain from Portland and get it to Europe before the other wheat regions in the northern hemisphere could get their grain into the market, hence it was advisable to move the crop as rapidly as possible after harvesting, for the early market was the best market. There is, of course, another side to this story. A complete release of the crop in August, September, and October would not be advantageous for there would be neither land nor water transportation facilities enough to handle the grain, and as was the case this past year, later developments of a crop shortage in the southern hemisphere might materially raise the price.

Oriental Competition. Competition in the Orient comes from (1) North China, (2) Manchuria, (3) Siberia, (4) Japan, particu-

larly Northern Hansher and Hikkaido, (5) Canada, (6) Australia. The Japanese crop is raised as an "in between" crop with rice. It is a winter crop, forced along as much as possible and cut when the grain is in the milk. This does not make the best of grain, but it has a fairly high gluten content. There is enough raised to affect the import demand materially, but there is no exportable surplus.

The precise amount of the North China crop is not known, nor are the estimates given at all accurate. It is known, however, that when the crop of North China is large that it materially affects the demand for imported wheat at Shanghai, the largest milling center in China. The Manchurian crop is also an uncertain quantity, however, Manchuria and the Amur Valley of southeastern Siberia are potential producing areas that are likely to be heard from in the future.

Canadian competition in the Oriental business has only been felt during the past three or four years. With the growth in production in Saskatchewan and Alberta, there was felt a growing need for an ice free port which could be used the entire year. Montreal and Quebec are not ice free, and the long rail haul to St. John and Halifax, or south to the American ports was extremely costly. Hence the Canadian National Railways initiated a new rate structure which takes most of the crop of these two western provinces to Vancouver, British Columbia. This change was quickly followed by the Canadian Pacific. These rates are low enough so that Canadian wheat can compete with the wheat from the Pacific Northwest in any market. Owing to lower land values wheat can be produced somewhat more cheaply than it can in this territory, consequently in a pinch Canadian wheat can undersell American wheat and still leave a profit for the farmer. This is an alarming feature in the Oriental trade for, as has been pointed out, the Oriental market is extremely sensitive to the price factor. As yet this development of the Canadian wheat shipments through Vancouver is too new to definitely predict what will happen, but Canadian wheat will surely be a keen competitor in the future with wheat from the Pacific Northwest.

The Australian competition is keen at Hong Kong, the South Sea Islands, and the Dutch East Indies in normal crop years. There

are, however, periods of crop failure in Australia so that the intensity of competition varies from year to year.

Foreign Competition in the Flour Trade. The most serious competition in the flour trade comes from the Japanese and Chinese native mills. In Japan the native mills control the situation, and American exports to that area are constantly dwindling in comparison to wheat shipments. The American millers lost out during the World War when both because of a lack of tonnage to move the cargo, and the high freight rates, they were practically forced out of the Oriental trade, thus giving the Japanese millers an excellent opportunity to expand their trade. The Shanghai mills offer the most severe competition in the Chinese trade, but were unable to make as much headway as the Japanese millers during the war period.

Since the European trade is almost exclusively in wheat, it may be well said, that there is no competition in flour trade in that area.

In the domestic flour trade the Pacific Northwest must meet the eastern millers in every instance. The Pacific Northwest millers do not enjoy an exclusive market in any continental United States market, except the local market.

Future Trends in Pacific Northwest Wheat Marketing

In the way of general conclusion it may be well to point out a few of the possible trends that may take place in the distribution of wheat and flour of this area. There can be no doubt but that the Pacific Northwest will have an exportable surplus of wheat for a long time to come for the production is so far in advance of domestic demand that there is no immediate chance of home demand overtaking supply. There are four markets at the present time that are important, two domestic and two foreign. The foreign markets are Europe and the Orient, the domestic markets, California and the Cotton Belt. The domestic markets will first be briefly discussed and then the foreign markets.

Domestic Markets—California. California has been an excellent customer and probably will continue to be, but the California market

has been pretty thoroughly exploited, so that such increase as does take place will be the result of the expansion of population. If the population continues to grow as rapidly as in the past few years, there will continue to be a rapid increase in the size of the market. But such an event is by no means certain, so that it seems best to say that the California market has had its most rapid growth, and that in the future this market will increase but slowly.

The Cotton Belt. The domestic market which appears to hold forth the best hope for future development is the Southern Market. It is only since the war that the effect of the Panama Canal has been felt, as the figures in Table 5 indicate. This market for high starch flours should grow in direct proportion as two factors make themselves felt, one, the increase in population in the Southern States; two, the decline in wheat production or the greater absorption at home of the winter wheat crop of the Corn Belt. The first reason should be clear enough, but the second may need some explanation.

Prior to the war period wheat flour consumption in the industrial region east of the Mississippi tended to increase at a greater rate than wheat production east of the Rocky Mountains. Exports of wheat from the United States declined from 215,000,000 bushels in 1900 to 69,000,000 in 1911, when they began to rise slightly, and rose enormously during the war. Many of those interested in agriculture predicted at that time (1911) that the United States would cease to be an exporting nation in the near future and become an importer of wheat. The demand for breadstuffs from 1914-19, gave a great impetus to wheat raising. Corn Belt farmers began to raise wheat again in large quantities after they had practically ceased to do so under normal conditions, it being more profitable to go into other lines of agriculture. The wheat acreage has shown a steady decline since 1921, as a result of the fall in the price of wheat, and if the price of wheat continues to be low, such a decline will continue. The yield per acre in the Corn Belt is lower and land values higher than in the wheat region west of the Mississippi; consequently the Corn Belt is a high cost producer. It is logical to assume that under normal conditions the output of wheat in the Corn Belt will decline. It is also logical to assume that the popula-

tion in the Great Lakes—Atlantic Coast area will continue to increase. The result will naturally follow that all of the wheat raised east of the Rocky Mountains will be consumed and more will be needed to meet the demand for flour.

If these assumptions are true, it follows that practically all of the soft winter wheat crops will be used at home by the millers in mixing with hard wheats, thereby decreasing the amount of "Missouri" flours which have heretofore supplied the Cotton Belt Market. As a result of this decrease in supply an increase in demand for Pacific Northwest flours in the Cotton Belt may logically be expected. This area can be reached by water from Seattle and Portland so that in the matter of transportation charges the Northwest will be better able to compete than prior to 1914, when all shipments went by rail.

While these two markets (California and the Cotton Belt) and such increase of the local population in the Pacific Northwest as does take place will consume an increasing proportion of the Pacific Northwest surplus, there will still be a considerable portion left for foreign export. These two domestic markets are at present leaning heavily toward flour purchases and away from wheat. As stated in Part V there is little likelihood of developing a market in the North Atlantic States either in wheat or flour, because of the special demand for high gluten flour.

Foreign Markets

In table 3 it was pointed out that since 1900 the average portion of the total crop exported has been 38.4 per cent, while Charts III and IV, Part III indicate that Europe has taken about two-thirds of all wheat exports and the Orient the same of flour, except during the war period. The balance has gone to various foreign markets.

Europe. While western Europe has been the most important market for Pacific Northwest wheat since the very start of exporting, it seems quite likely that it will decrease perceptibly in importance in the future. Since 1900 flour has never moved to Europe from this region in important quantities, except between 1914-19. As for the future we may well quote from the concluding paragraph

of Dr. E. G. Nourse's recent study (1) in this connection. He says in part:

"We conclude that, as a prosperous Europe in the position of a heavy creditor of the United States was declining in importance as a market for our agricultural products at pre-war levels, less prosperous (not to say crippled) Europe, shorn of her credits here, and our debtor on a tremendous scale, cannot be expected to be a good market at present, and prospectively higher level of cost (of production.) Hence, agricultural exports (to Europe) may be expected to drop still further in 1924 and thereafter."

If the opening of the Panama Canal was expected to have an important effect on increasing Pacific Northwest exports of grain to Europe, such an expectation does not appear to be likely of fulfillment, although curiously enough Canada is making use of that waterway for shipping much of her crop to Europe. The events of this last year, as a result of a short crop in Canada and the Southern Hemisphere, does not invalidate in any way the general trend of this reasoning, for such periods of short crop are only of temporary duration, and while for one or two years a reversal of a general trend may appear, conditions will soon revert to normal.

The Orient. The Orient appears to be the most logical market for the Pacific Northwest grain and flour, both because of the geographic proximity of the two regions, and because the Oriental market can best use high starch flours. It is not possible to say yet whether China will follow in the footsteps of Japan and import more wheat and less flour in the future, but there is undoubtedly a permanent market for wheat and flour in the Orient. This market will be likely to broaden out quite rapidly as the standard of living in China and Japan rises. The potential market in the form of an enormous population is there, so that it becomes a question of buying power. Since the volume of business is so largely on price, it is quite possible, in fact probable, that Canadian competition will force the American exporters to change their export methods some-

¹ American agriculture and the European Market, by Edwin G. Nourse. Written under the auspices of the Institute of Economics, published by McGraw-Hill Book Co., 1924, page 226.

what to meet this new situation. It may become necessary to maintain active selling branches and warehouses abroad, a thing that is not done now. While this will increase the absolute cost of doing business somewhat, the result of carrying on a direct sales campaign may be to so increase sales as to make the relative cost lower. If individual exporters cannot do this the situation might be met by the formation of an export corporation under the Webb-Pomerene Act, as has been done in other lines of business both in this region and the east. There can be no question but that there is already a large permanent market in the Orient, and a still larger market potentially for Pacific Northwest wheat and flour, regardless of any competition that may have to be met.