WHEAT STUDIES

OF THE

FOOD RESEARCH INSTITUTE

VOL. I, NO. 3 STANFORD UNIVERSITY, CALIFORNIA FEBRUARY 1925

DEVELOPMENTS IN THE WHEAT SITUATION AUGUST TO DECEMBER, 1924

I. CHARACTERISTICS OF THE PERIOD

The crop year 1924–25 is exhibiting marked contrasts to that of 1923–24. World crops of wheat and rye are small, instead of exceptionally large, and even more deficient in quality than in quantity, though American wheat growers were blest with excellent yields. Crops of important substitutes, except potatoes and rice, are short. The intensity of Europe's effective demand for imports is increased by improvement in her economic and financial position. Whereas last year wheat supplies were so abundant that demands were easily met, this year requirements are fulfilled from available supplies only with difficulty. This situation, which was partially realized toward the end of the last crop year, has become increasingly evident. The result has been a remarkable rise in wheat prices, amounting to more than 50 per cent from May to December, when the rise had not yet reached its culmination. The increase is the more pronounced because for several years wheat prices had been abnormally low.

A notable feature of the period has been the phenomenally rapid marketing of the large American crop. Under the pressure of farm indebtedness, much of it overdue or unfunded, even the prices of the summer and early autumn were temptingly high. Under these circumstances, farmers followed to an unusual degree their customary practice of heavy autumnal marketing. The Grain Marketing Company openly encouraged this rapid marketing, despite much discussion, in recent years, of the advantages of "orderly marketing" of wheat. In Canada, on the other hand, the wheat pool influence has apparently been in the direction of slower marketing. Largely because of insistent European demand and rapid marketing in the United States, the international movement from August to December was exceptionally heavy, amounting to nearly 50 per cent of supplies available for export for the year.

The full effects of the price increase have not yet been felt by consumers; but already, in Europe in particular, governmental investigations are the order of the day. In almost every country measures have been taken to deal with the problem, and more are seriously under discussion. If the situation is to be wisely met, it is highly important that it should be understood.

The time is ripe for a review of the developments of the first five months of the crop year and an appraisal of the position at the turn of the year, and for a consideration of

the outlook. Northern Hemisphere crops have been harvested, largely threshed, and in large measure marketed. The Southern Hemisphere crops are harvested. In the Northern Hemisphere fall sowings have been completed for the 1925 crop. Exports for the first five months of the year are known. The financial and psychological elements in the situation are fairly clear. While there are still many uncertainties in the position and outlook, these are illuminated by a survey of the recent period. Such a survey, covering supplies, importers' requirements, exports and exportable surpluses, and the movements of prices, is undertaken in the following discussion.[1]

II. THE UNFAVORABLE SUPPLY SITUATION

The principal cause of the notable increase in wheat prices is found in the supply situation. Last year, weather conditions were almost universally favorable, except in the United States. This year, they were almost as universally unfavorable, except in the United States, India, and Australia. The change has affected quality as well as quantity, and other leading crops as well as wheat. The result is a small world wheat crop, of low average quality, in a year when wheat substitutes are also deficient in supply.

Crop Developments, June to December

Throughout the last six months of 1924 there was considerable uncertainty regarding the size of the crops. Broadly speaking, however, the December world-crop estimates are fully as large as was forecast last June. The United States crop, forecast on June 1 as 693 million bushels, was officially estimated on December 1 at 873 millions, an increase of 180 millions.[2] In most other countries the changes in forecasts were downward, in the aggregate about enough to offset the increase in the United States crop. Thus the Canadian outlook became worse in June, when the American outlook brightened most, and subsequent reductions in Canadian estimates, from June 30 to December 31, amounted to 64 million bushels.[3] The Argentine crop matured under conditions less favorable than the average, and has turned out about 35 million bushels less than post-war average yields would have given. On the other hand, the Australian crop improved by about an equal amount. Early in the season Russia was expected to have a small export surplus, but later developments removed this possibility. Developments in Hungary and the Balkan States also reduced the only moderate expectations from the Danube basin. The French crop turned out somewhat larger than had been anticipated, but in many other countries of western and central Europe the harvests were smaller than forecasts had indicated. The Indian crop, though of good size, also proved inferior to early estimates by some 20 million bushels.

On the whole, therefore, the harvest season, instead of showing improvements in quantity, bore out the pessimistic forecasts of the late spring. The deterioration in quality was greater than was anticipated in June. The net result was a large volume of tail wheat and of grain which, though millable, would yield much less than the normal amount of flour.

World Wheat Supplies Small and of Poor Quality

Table 1 summarizes the world wheat supplies for the crop year 1924–25, according to the latest estimates, in comparison with figures for the four previous years and the five-year pre-war average. Statistics for Russia are excluded partly because they are unsatisfactory, partly because the Russian crops since the war have had little significance for the rest of the world. The table indicates a net reduction of some 380 mil-

[1] Frequent reference in the course of this study is made to the text and the appendix tables in Wheat Studies, No. 1, December 1924: "The World Wheat Situation 1923–24—A Review of the Crop Year," which furnishes an essential background for the survey of recent months.

[2] See Wheat Studies, No. 1, Appendix Table V.

[3] *Ibid.*, Appendix Table VI. The December 31 figure was 240 million bushels.

lion bushels below the bumper yield of 1923. Important decreases in Europe, Canada, and Argentina were partially offset by increases in the United States and Australia.[1]

The decline in production this year is due in part to a reduction of about 5 million acres in harvested area. This is largely accounted for by the decrease in United States acreage. Increases in Argentina and Australia more than offset the decline in Canada, and changes elsewhere were small.[2] Much more largely it was due to reduction in yield per acre, except in the United States, Australia, and France. The improvement in yield in the United States, however, so far offset decreases elsewhere that for the world wheat-producing areas as a whole the 1924 average yield was almost as good as the average of the first five post-war years, and was materially exceeded by no post-war year except 1923. Table 2 illustrates this point.[3] In short, so far as quantities are concerned, the comparison with bumper yields of 1923 exaggerates the inferiority of this year's crops.

Indeed, Table 1 brings out clearly the striking fact that the world wheat supplies during the present season are about the same as in 1921–22 and only a little smaller than in 1922–23, whereas wheat prices are much higher. It is important to examine the causes of this change. Except for the Canadian and Australian situation, the distribution of supplies this year, one observes, is much the same as it was two years ago. The wheat carryover is not responsible; it is never large enough to influence world prices strongly, and on the whole it was larger at the opening of this crop year than in 1921–22 or 1922–23. The following differences, however, help to explain the striking dissimilarity of prices:

(1) The quality of wheat in the present season in Europe and in Canada is much lower than it was two or three years ago. If, as is currently estimated, one-sixth of the crop of Europe and one-third of the crop of Canada are of distinctly inferior quality, the millable crop of 1924 is considerably less than the millable crop of 1922, though the quality of that crop in Europe was by no means high. This fact has contributed to the retardation of export from

TABLE 1.—WHEAT PRODUCTION IN PRINCIPAL WHEAT-PRODUCING COUNTRIES, PRE-WAR AND POST-WAR*

(Million bushels)

Year Average	World (ex-Russia)	Europe (ex-Russia)	United States	Canada	British India	North Africa	Japanese Empire	Argentina	Australia
1909–13	3,005	1,348	690	197	352	92	32	147	90
1920	2,894	948	833	263	378	63	41	156	146
1921	3,116	1,216	815	301	250	106	39	191	129
1922	3,156	1,044	868	400	367	70	38	196	109
1923	3,499	1,262	797	474	369	107	37	257	126
1924	3,120[a]	1,082	873	262	364	84	36	191	162

* Source: *Foreign Crops and Markets.*
[a] Estimated by allowing about 50 million bushels for Southern Hemisphere other than Argentina and Australia.

TABLE 2.—WHEAT YIELD PER ACRE IN PRINCIPAL WHEAT-PRODUCING AREAS, 1924, WITH COMPARISONS*

(Bushels)

Area	1909–13 average	1919–23 average	1923	1924
World (ex-Russia)	15.3	14.7[a]	15.9	14.5[b]
Northern Hemis.	16.1	14.9[a]	16.1	14.8
Southern Hemis.	10.5	12.9	14.6	12.4[b]
United States	14.7	13.3	13.4	16.1
Canada	19.8	15.2	20.9	12.1
Europe (ex-Russia)	18.5	17.5[a]	19.2	16.4
North Africa	11.7	10.7	12.6	10.2
India	12.0	11.8	12.0	11.8
Japanese Empire	18.2	18.3	17.7	16.9
Argentina	9.2	12.8	14.9	10.8
Australia	11.9	12.2	13.2	15.0

* Computed from the total production and acreage of the areas named.
[a] Average of 4 years, 1920–23.
[b] Southern Hemisphere yield is based on Argentina and Australia.

[1] There are still possibilities of revisions in estimates, and these revisions may conceivably be large enough, in this year of close adjustment between supplies and requirements, to affect the general position.
[2] See WHEAT STUDIES, No. 1, Appendix Table I (*B*). The Australian wheat area is now estimated at 10,775,000 acres.
[3] See also *Ibid.*, Appendix Table I (*C*).

Canada, to the acceleration of export from the United States, and to the somewhat panicky autumnal import into Europe.

(2) The situation in wheat is intensified by the position of rye. The world rye crop and the exportable surplus are the poorest since 1920. The rye crop of Europe, ex-Russia, is 164 million bushels less than last year; the bread-grain crop is 344 million bushels less than last year. Adding to the 164 million bushels the amount of rye received by Europe from Russia last year, the rye deficit is over 200 million bushels, to be covered by wheat or coarse grains. This obviously reinforces the influence on wheat prices exerted by the European wheat shortage of 180 million bushels compared with last year.

(3) Crops of coarse grains, which are in part substitutable for bread grains and whose prices are interrelated with those of bread grains, were poorer in 1924 than in 1922. The reported crops of corn, oats, and barley in the Northern Hemisphere are nearly 10 per cent less than last year. European crops of coarse grains, however, are only 5 per cent less than last year, and 10 per cent greater than in 1922. But the enlarged animal husbandry of the continent makes for greater requirements. Poor crops of coarse grains in Argentina tend to aggravate the situation. Feeders and industrial users of coarse grains have been bidding up the prices, thus contributing to raise prices of wheat and rye.

(4) The potato crop of Europe, though generally larger than in 1923, was much poorer in 1924 than in 1922, both in quantity and in quality. This is especially true in western and central Europe, where the potato is of the largest relative importance. A bumper crop in France is the outstanding exception, though crops in Germany and Poland are of good size.

(5) Moreover, mere increase of population calls for annual increases in wheat requirements. Furthermore, increasing economic readjustment from the abnormal war and post-war situation in Europe accelerated the increase in wheat requirements. Hence a normal requirement this year is larger than the normal requirement of two or three years ago.

CANADIAN CROP MOST SERIOUSLY AFFECTED

A late spring, combined with unfavorable weather during the critical growing season, accounts for the small size and poor quality of the Canadian crop. Planting did not become general in the Dominion until May, consequently there was a reduction of a million acres from the high figure of 1923. No official forecast of the probable size of the crop was made until the end of June; but even by that time there had been so much dry weather in important producing areas that the government put out a statement implying a yield of only about 14.5 bushels per acre, as compared with the final report of 21 bushels last year and an average of 19.8 bushels before the war.

Drought continued during the first part of July, but was broken in most sections during the latter half of that month. However, the condition report issued by the government for the end of July showed a further decrease in the anticipated yield. In August the favorable influence of rains was partially offset by damage from other causes, including frost, rust, and sawfly. The official report then showed improvement for the crop as a whole, however, and the yield per acre was estimated at 13 bushels, the total crop at 292 million bushels. From that time on there was deterioration, the October 31 report placing the total output at 272 million bushels and that of December 31 at 262 million bushels.[1]

The quality of the Canadian crop is exceptionally poor. Of the grain inspected in western Canada during the first four months of crop moving, only 60 per cent was of contract grade, i. e., No. 3 or better. If these inspections prove typical, the crop will average lower than any other post-war crop, as shown by Table 3.

However, much of the low-grade Canadian wheat, while containing damaged grain, is high in protein content. Consequently it is suitable for milling, indeed is well adapted for blending with European soft wheats, which are lower in protein content as well as light in weight. Since the flour

[1] For spring-wheat estimates, see WHEAT STUDIES, No. 1, Appendix Table VI. The December 31 estimate is 240 million bushels.

yield per bushel is abnormal, this wheat naturally sells at a discount under standard grades; but in December, Manitoba No. 4 was practically on a par in England with

TABLE 3. — GRAIN INSPECTED IN THE WESTERN INSPECTION DIVISION OF CANADA*

Crop year ending Aug. 31	Cars inspected	Ratio grading No. 3 or over
1919–20	100,014	72.7 %
1920–21	149,669	86.3
1921–22	181,623	75.2
1922–23	228,611	92.1
1923–24	294,468	86.0
1924–25 (Sept.–Dec.)	111,872	60.2

* Source: *Canadian Grain Statistics.*

No. 2 Hard Winter wheat. Europe is taking and will continue to buy this grain. Indeed, it now seems likely that most of the hard Canadian wheat grading 3 to 6 will pass into export.

EUROPEAN WEATHER VERY UNFAVORABLE TO CEREAL CROPS

In Europe also the small crop was due mainly to bad weather. In the exporting countries of the Danube basin—Hungary, Roumania, Jugo-Slavia, and Bulgaria—increases in wheat area amounted to about 1½ million acres; but elsewhere, especially in Italy, Spain, and France, there were almost counterbalancing reductions. For Europe as a whole, exclusive of Russia, the wheat acreage was increased by about 300,000 acres. The Russian wheat acreage in 1924 was considerably larger than in 1923, —43 million acres as compared with 35 million, according to unofficial estimates.[1]

Even early in the season it seemed probable that yields this year were not going to be so high as last. Broomhall reported in the *Corn Trade News* of April 1 that the severe winter had caused damage in several countries. At that time, however, the Russian and Roumanian crops were still promising. During the next two months conditions became less satisfactory. In northern Europe the spring was late and wet, while around the Mediterranean and east into southern Russia there was damaging drought. On June 11 Broomhall reported that "prospective yields have been reduced in Italy, Greece, North Africa, the Balkan countries and southern Russia," and estimated the loss to be at least 80 to 120 million bushels.[2]

During June and July the weather was better, but the damage was not offset. Broomhall increased his estimate of drought damage in southern Europe[3] and reported a serious situation in Russia arising from the combination of drought and vermin. Official Russia still forecast a larger crop for 1924 than that of 1923, though this seemed doubtful in view of weather conditions. In central Europe, also, conditions were less promising. French crops, however, seemed to be progressing satisfactorily, and the British outlook was still favorable.

By August harvesting was well advanced in southern Europe and there was no longer any doubt that crops were short. In northern Europe from that time on, the crops steadily deteriorated. The weather was excessively wet, which not only made harvesting difficult but for the time at least made quantities of damaged wheat unmarketable. On September 23, Broomhall reported that there was "no doubt about the poor quality and condition of much of the home-grown supply of the chief importers of western Europe."[4] From France it was reported that much wheat was sprouted and mouldy. The German Government, in October, issued a report describing the position of the crops still in the fields as most critical; much of the bread grain, it stated, would be quite unfit for milling, or else so poor that the flour yield was likely to be very short. The English crop was reported as badly weathered and musty. Later Broomhall stated that much of the English wheat was so poor that it could be used only for animal fodder, while, although the French crop was large in volume, much of it was of poor quality.[5] In Russia conditions were so serious that in October the government admitted that there would be no wheat for export.

[1] *Foreign Crops and Markets*, Nov. 12, 1924, p. 489.
[2] *Corn Trade News*, June 11, 1924.
[3] *Ibid.*, July 1, 1924.
[4] *Ibid.*, Sept. 23, 1924.
[5] *Ibid.*, Sept. 30, Oct. 7, 1924.

In October and November drier weather in many countries made possible the threshing of grain under favorable conditions, thus converting into millable grain of low quality much that otherwise could have been used, if at all, only for feed. Despite this improvement, there is no question that European crops have been inferior in quality even more than in amount.

Latest estimates of European production in 1924, in comparison with earlier years, are given in Table 4. It will be observed that only in France and in Jugo-Slavia were the 1924 crops larger than those of 1923. The largest proportional reductions occurred in Poland, Roumania, Italy, and Spain. On the whole, however, if present estimates are to be trusted, the European crop was the largest since the war except for 1923; and with the exception of Roumania, Bulgaria, and Poland, the crops look small only in comparison with the good crops of 1923.

TABLE 4.—WHEAT PRODUCTION OF PRINCIPAL COUNTRIES OF EUROPE, 1922–24, COMPARED WITH PRE-WAR AVERAGE

(Million bushels)

Country	1909–13 average	1922	1923	1924
Roumania	158	92	102	74
Hungary	71	55	68	50
Bulgaria	38	38	36	28
Jugo-Slavia	62	44	61	70
Total exporters	329	229	267	222
United Kingdom	60	65	58	55
France	326	243	276	282
Germany[a]	131	72	106	89
Italy	184	162	225	171
Spain	130	125	157	126
Czecho-Slovakia	38	34	36	34
Poland	64	42	50	33
Others	86	72	86	70
Total importers	1,019	815	995	860
Total Europe (ex-Russia)	1,348	1,044	1,262	1,082

[a] As explained in WHEAT STUDIES, No. 1, p. 17, the pre-war estimates are high, and the post-war ones low.

RUSSIA, NORTH AFRICA, AND INDIA

During the summer Russian official reports carried an optimistic tone, but by November it was apparent to the European trade that Russia would have little grain for export this year and might, indeed, be forced to import. Drought during the summer was widespread in southern Russia, and famine threatened again to fall on sections that had not yet recovered from the physical effects or the recollections of the famine of 1921. Since it was clear that the government would be obliged to undertake substantial transfers of grain from surplus-producing areas to deficiency areas, the prospect of export faded. The most reliable reports estimate the total grain crop to be between 45 and 47 million short tons, a decrease of 4 or 5 million short tons as compared with 1923.[1]

The autumnal marketing of grain lagged. When the government undertook to accelerate the movement, peasant resistance became manifest. Despite official optimism, the grain trade of Europe came to the view that not only would exports of wheat and rye from Russia decline to negligible figures, but imports into northern Russia might be required for the purpose of sustaining the industrial proletariat of Moscow and Leningrad, and to stabilize prices and movements. Substantial imports and import orders have since borne out this expectation. Russia has apparently a good crop of oil seeds. These may be expected to pass into export in relatively large volume, in effect to exchange feed for food. Russian imports and exports have a larger meaning in the psychological than in the physical sense.

It was known early in the season that the North African crop would be small, since the drought which injured the southern European crop also affected North Africa. According to the latest estimate, 84 million bushels were harvested in 1924, distinctly below last year's output of 107 million bushels, but not so low as the outputs of 1920 or 1922. The short crops in North Africa aggravate the shortage of durum wheat. It seems probable that Algeria, normally a wheat exporter, will be a net importer this year.

The crop of British India, harvested last spring, was reported by Broomhall in June[2] to be much superior to last year's in both

[1] *Foreign Crops and Markets*, Nov. 12, 1924, p. 493.
[2] *Corn Trade News*, June 17, 1924.

quantity and quality. The latest official estimates, however, show a slight reduction. The acreage this year was slightly larger and the yield per acre a little lower than last year. On the whole, however, there has been little variation in the Indian output of the last three years, and both crops and yields during this period have been close to the pre-war average.[1]

It is still too early to estimate the Indian crop of 1925, some of which may be available for the current crop year. According to present information, however, the planting season has been favorable, and there is reason to anticipate in 1925 a crop at least as large as that of 1924.

American Crop an Excellent One

In the United States the situation was in marked contrast to that in Canada and Europe. Here, notwithstanding a large reduction in wheat acreage as compared with last year (or any other post-war year), there was a very considerable increase in total production. Planting for winter wheat covered only 40 million acres as compared with 46 million planted for the 1923 harvest, but less acreage than usual was abandoned and the reduction in harvested winter wheat acreage was only about 3 million acres.[2] There was a reduction of over 2 million acres in spring wheat land; hence the total reduction in harvested acreage was nearly 5½ millions. Production of winter wheat was 590 million bushels, or about the same as that of 1922, when the area harvested was 6 million acres greater; while the spring wheat output was 283 million bushels as compared with 281 million in 1922, when the area was over 2 million acres larger.

Table 5 shows the acreage, production, and acre yield of winter and spring wheat this year as compared with earlier years. The impressive feature of this table is the high yield per acre for both winter and spring wheat, in each case distinctly the best since the Armistice and well above the pre-war average. The winter wheat yield per acre has been exceeded only four times (1906, 1913, 1914, 1915) and the spring wheat yield only three times (1912, 1915, 1918) in the last twenty-five years, and the aggregate yield only twice (1914, 1915) in our history. This improvement occurred in spite of poor crops in the Pacific Coast states and moderate yields of soft winter wheat.

Table 5.—American Wheat Production, Acreage, and Yield per Acre*

Year	Production (million bus.)		Acreage harvested (million acres)		Yield per acre (bushels)	
	Winter	Spring	Winter	Spring	Winter	Spring
Average 1909–13	441	249	28.4	18.7	15.6	13.3
1919	760	208	50.5	25.2	15.1	8.2
1920	611	222	40.0	21.1	15.3	10.5
1921	600	215	43.4	20.3	13.8	10.6
1922	587	281	42.4	20.0	13.8	14.1
1923	572	225	39.5	20.1	14.5	11.2
1924	590	283	36.4	17.8	16.2	15.9

* U. S. Dept. of Agriculture *Yearbook, 1923*, and *Crops and Markets, Monthly Supplements*, 1924.

Undoubtedly one cause of improved yields lies in the withdrawal in recent years of lands yielding low returns per acre. The chief cause, however, lay in favorable weather conditions in the hard winter and spring wheat belts. It is a hard wheat year.

It was not fully apparent until well on in the season that the crop was going to be so excellent. The fall-sown wheat wintered well in the hard wheat areas, but soft wheat suffered considerable damage. The abandonment of planted areas was less than the average before the war and far below that of the two preceding years.[3] In the spring-wheat states, soil and moisture conditions at the time of planting were reported the best in several years. Altogether, the crop made a good start.

The early estimates of the probable size of the crops as usual required radical revision. The April and May estimates of the Department of Agriculture forecast an output of winter wheat of 550 million bushels, which implied a final yield per acre of slightly over 15 bushels, as compared with 15.6 bushels in the five years before the war. By that time it had become apparent that Kansas was likely to harvest

[1] See above, Table 1, p. 79; Wheat Studies, *No.* 1, Appendix Table I; and below, pp. 99–100.
[2] See Wheat Studies, No. 1, Appendix Table III.
[3] See *Ibid.*

an unusually large crop, Illinois a small one, and the far western states not more than half a crop. Toward the end of May, dry weather became pronounced in Kansas and Nebraska, and the earlier reports of drought in the west were confirmed. Consequently, in its June 7 report the Department reduced its estimate of winter wheat output to 509 million bushels. In issuing its first spring-wheat report at the same time, it estimated a total of 184 million bushels. Unofficial estimates of the winter-wheat crop were some 40 million bushels higher.[1]

With the coming of rain, conditions improved rapidly and continuously in Kansas and in most sections of the country. In the hard winter wheat areas, the grains filled out remarkably in the later stages, and were harvested in an excellent condition. Hence the striking increase in the Department's estimate of 509 millions as of June 1 to 589 millions August 1. In the spring wheat area the improvement over average condition continued throughout the season, causing a net increase in the estimate from 184 millions as of June 1 to 283 millions as of December 1.[2]

The 1924 wheat crop is distributed quite differently from that of 1923. The hard winter wheat crop, produced chiefly in Kansas, Nebraska, and Oklahoma, is abundant and of high quality, whereas last year it was short and poor. The hard spring wheat crop, produced chiefly by Minnesota, the Dakotas, and Montana, is also large, far larger than last year, and of good quality as well, but in part of lower protein content than the crop of 1923. Owing to drought, crops in the Rocky Mountain states, except Montana and Colorado, were poor, and in the Pacific Coast states very poor. Soft winter wheat crops varied from state to state, but were on the whole deficient, notably so in Illinois, the largest producer, and in Missouri, and the protein content is much lower than that of the larger crop of 1923.

[1] See *Price Current-Grain Reporter*, June 18, 1924.
[2] See WHEAT STUDIES, No. 1, Appendix Tables IV and V.
[3] *Crops and Markets*, November 1924 *Supplement*, p. 386.
[4] See above, Table 1, p. 79, and WHEAT STUDIES, No. 1, Appendix Table I.

Taken as a whole, the wheat is grading high. Of that inspected by the Government in the months of July, August, and September, 88 per cent graded No. 3 or better, as compared with 80 per cent of the 1923 crop and 82 per cent of the 1922 crop. Some 28 per cent graded No. 1, also a relatively high figure.[3] The high grading of the hard wheat is paralleled by milling quality.

AUSTRALIAN CROP EXCELLENT, ARGENTINE ONLY FAIR

The Australian and Argentine harvests are now completed, and much of both crops is already sold. It is possible, therefore, to obtain fairly accurate forecasts as to final output in these two countries.[4] In both countries a somewhat larger area was planted to wheat this year than last,—in Argentina 17.7 million acres this year as compared with 17.2 million last year; in Australia 10.8 million this year and 9.5 million last year, making a total increase of almost two million acres.

In Australia weather conditions were favorable during most of the growing season. The latest official estimate is 162 million bushels, reflecting the best yield per acre since the bumper crop of 1920. This compares with an average of 90 million in the five years before the war and with 126 million last year. The Argentine crop suffered from early drought and frost and from late rains, and is consequently much poorer than last year's. The most serious damage was suffered in southern Argentina; the northern section of the country appears to have an average crop. Estimates have declined during the season. The latest figure for Argentina is 191 million bushels, small considering the acreage harvested. The condition of the wheat is fair to good.

WHEAT SUBSTITUTES ALSO SCARCE

Coarse grains and potatoes serve as substitutes for wheat on the European dining table and in the feeding yards. This year's world supply of wheat, rye, corn, oats, and barley is considerably short of the volume of last year. Taking the countries for which comparable estimates are available (which

approximate a world total) there has been a reduction of practically 10 per cent. The reduction is slight in oats and barley, heavy in corn and bread grains.

Rye. In Europe the 1924 rye crop suffered even more seriously than wheat. The three important rye districts are Russia, Germany, and Poland. Weather conditions were extremely unfavorable to the crop in all three countries. Excluding Russia, the total European output was 663 million bushels as compared with 827 million in 1923.[1] This means a reduction of about 20 per cent to augment a 14 per cent reduction in the European wheat output. The Russian crop suffered so badly that Russia has none for export, whereas last year she exported 43 million bushels. The only country outside of Europe that produces rye on a considerable scale is the United States. Here the crop, now estimated at 64 million bushels, was distinctly good, considering the acreage harvested. Upon the whole the world rye crop is the poorest since 1920, and only about 73 per cent of the pre-war average. The world exportable surplus of rye does not seem to be over 60 million bushels. The price of rye has risen relatively more than that of wheat.

Corn. The world supply of corn (maize) this year will probably be short of the 1923 total by about the same ratio as the decrease in European wheat production, i. e., 15 per cent. But instead of Europe, it is the United States which suffers in this case.[2] The Danubian countries and Italy, which produce the major portion of the European domestic supplies, have good crops. In the United States, however, where production is usually three-fourths that of the world, weather conditions this year were unfavorable. Consequently the total output is lower than in any year since 1903 and over 600 million bushels less than last year. The quality of the crop is also poor. Though a great deal of the crop is unmerchantable, that fact has reduced significance because about 80 per cent of the corn is fed in the county where it is grown. Some 17 million acres of corn, 16 per cent of the acreage, were utilized for ensilage and forage. Argentine has still some unsold old corn and a large acreage of new corn.

Potatoes. The potato crop of the United States is relatively large, the price is low. There is, however, little substitution for wheat by potatoes in the United States, and little mobility in American potatoes except for commercial grades of table potatoes. In northern Europe, where the potato is used for feed, industrial material, and alcohol production, the crop is mobile, and by substitution potatoes may be employed to cushion a shortage of cereals. This makes the potato much more important in Europe, in the event of cereal shortage, than in the United States.

At present it appears that the north European potato crop is above normal size, though smaller than two years ago,[3] but probably subnormal in quality. The British crop is small and poor, and British potato prices are very high. The German crop is reported some 12 per cent larger than last year; the crop in Poland is slightly larger than the fair crop of last year; the French crop is exceptionally large. In several countries, however, potatoes were harvested in a moist condition, and a heavy spoilage may be revealed when the stored stocks are uncovered in the spring. Nevertheless, the wastage will fall on feed uses rather than on food uses, and a notable substitution for bread grains by potatoes may be expected over northern continental Europe.

Oats and Barley. An excellent crop of oats in the United States will serve here to relieve in some measure the shortage of corn. On the other hand, the European crop is short, Germany alone reporting a fair yield. Russian export supplies are negligible, the Canadian crop is far below last year's, and the Argentine crop is below the average.[4] Since Canada and Argentina, the principal exporters, have reduced supplies, Europe will have to depend more heavily on the United States.[5]

[1] See Appendix Table I (*A*) for details and comparisons.

[2] See Appendix Table I (*B*) for details and comparisons.

[3] See Appendix Table I (*F*) for details and comparisons.

[4] See Appendix Table I (*C*) for details and comparisons.

[5] See an excellent brief statement published by Bartlett, Frazier & Co., Chicago, Dec. 12, 1924.

The world supply of feed barley is also short,[1] though the total barley crop of the Northern Hemisphere is slightly above the average for 1920–23. United States exports of oats and barley to Europe for the period July to December were more than double those of the corresponding period of last year.

Rice. So far as Asia is concerned, present information indicates a rice crop considerably larger than last year's, but smaller than that of 1922–23, except in Siam, which has apparently harvested a bumper crop.[2]

Before the season is over Europe may find the problem of feeding stuffs almost as difficult as that of bread grains. Export oats cannot make up the shortage in export corn, partly because of transportation conditions. Europe has a relatively large crop of potatoes, fodder roots, and by-products of sugar beets. It is the need for concentrates on the part of feeding-yards and dairies for urban consumption which constitutes the problem. Fortunately, there is an abundance of oil seeds, at prices relatively low compared with prices of coarse grains. The relative positions, in the world's market, of the prices of wheat, rye, corn, oats, barley, and oil seeds during the remaining months of the season, will furnish an interesting field of observation.

Contrasting 1924–25 with 1922–23, when Europe also had a short crop of wheat and rye, it seems clear that the supply and the availability of substitutes will be less now than then, particularly north of the latitude of the Alps. As against this, the high wheat prices constitute a greater incentive to substitution, particularly on the part of the rural population.

III. IMPORTERS' REQUIREMENTS

From 1920 until the present season, the world wheat market was a buyer's market. This season it is a seller's market. Under these circumstances, a scrutiny of considerations of demand is of particular importance. This is especially necessary in connection with the wheat "deficiency" countries, whose "requirements" for imports express demand in the international market.

The Nature of Importers' Requirements

Apart from the fact that importing countries are by no means a unit, the concept of importers' requirements, while seemingly definite, is susceptible of different interpretations, and these may vary from season to season. The term might be used simply to mean the imports that will actually be made. It might mean the quantity which importers will take as a minimum, while making all possible substitutions in the diet with rye, potatoes, barley, corn, oats, and other foodstuffs, at the same time restricting the use of wheat as animal feed and establishing a higher rate of extraction in milling. It might mean the amount necessary to furnish the average per capita supply of wheat or bread grains, milled at customary rates of extraction, irrespective of plenty or scarcity of other foodstuffs. It might mean the amount necessary to provide a total food supply in terms of calories, up to a normal level, offsetting deficiencies in meat, dairy products, sugar, and other foods. The variations between the minimum and maximum requirements, thus defined, would amount to several hundred million bushels.

An industrial analogy will make clearer the various meanings of "importers' requirements." A country imports copper. At a relatively high price, it will import only to cover essential uses of the metal; at a moderate price, imports will be broadened to supply copper for certain uses where other metals could be technically employed; at a low copper price, imports will be expanded to provide copper as a substitute for other metals. While the elasticity of demand for wheat is different from that of copper, similar considerations apply.

[1] See Appendix Table I (*D*) for details and comparisons.

[2] See Appendix Table I (*E*) for details and comparisons.

The factors determining importers' requirements are largely technical, but in part social and political. In a period of political and industrial instability, the level of the food supply and the state of public satisfaction with the dietary may exert a special influence on imports. Governments may even elect to import food, irrespective of price, by mortgaging the resources of a country, in order to maintain political stability and avert perversive social disorders. Under stable social conditions, however, price exerts the predominating influence in determining the effective requirements of a given year. A minimum requirement may exist independent of price influence; but beyond that, importers' requirements are different at different price levels. Estimates of quantities "required" must therefore have reference to assumed import prices of wheat, as well as to numerous factors in the economic and social situation in individual importing countries. The experience of 1923–24 strongly supports this view; and the different experience of the current year may be expected to give it further support.

Pre-War European Demand Relatively Constant

The principal wheat-importing area consists of the present Europe, exclusive of Russia. Within this area a few countries, such as Spain and Poland, are normally self-sufficing in wheat; a few others, in the lower Danube basin, are normally exporters. Practically every other country imports either wheat or rye or both. The other important wheat-importing area is the Far East, notably China and Japan; but the requirements of a large number of scattered markets, mostly tropical, make up a considerable total.

For the European area, it is illuminating to contrast the variations in per capita consumption before and since the war and their bearing upon import requirements in the current year.

It is difficult to make comparisons of the per capita wheat and rye consumption of pre-war and post-war Europe, on account of changes in boundaries, defective statistics of population, and the fact that comparable crop estimates before the war were not available for all countries. Of the net-importing countries of Europe it has been possible to obtain comparable figures for Scandinavia, Belgium, Holland, Germany, France, Switzerland, Portugal, Italy, and the United Kingdom (combined population 226 million). For the net-exporting countries, comparable figures are available for Austria, Hungary, Bulgaria, Roumania, Jugo-Slavia, and Czecho-Slovakia (combined population 62 million). In Table 6, comparing pre-war and post-war bread-grain consumption, these combined countries constitute a special "Europe" (total population 288 million). The principal countries omitted are Spain, Poland, the Baltic States, Greece, and Turkey in Europe.

Table 6.—Per Capita Bread-Grain Consumption of Special "Europe," Pre-War and Post-War*

1907–14 average	472	pounds
1907–08	446	"
1908–09	445	"
1909–10	479	"
1910–11	467	"
1911–12	473	"
1912–13	499	"
1913–14	493	"
1921–24 average	413	"
1921–22	416	"
1922–23	385	"
1923–24	437	"

* Sources: *International Yearbook of Agricultural Statistics* and *International Crop Report*. Post-war population from League of Nations, *Monthly Bulletin of Statistics*, Vol. V, No. 7. Figures are for special "Europe" of 288 million population.

Table 7 (p. 88) gives the approximate wheat supplies per capita for the net-importing countries of Europe and for the special "Europe" in the years 1907–14 and 1921–24.

Before the war the average per capita wheat supply for "Europe," as a whole, was 5.36 bushels; for the importing countries alone, 5.57 bushels. The wheat consumption of the wheat-surplus countries was less than the consumption of the wheat-deficiency countries. The lowest figure for "Europe" was 4.95 bushels, 7.6 per cent less than the average; the highest figure was 5.75 (in the abnormal year of the Balkan

wars), 7.2 per cent above the average; the largest per capita supply for any one year was 117 per cent of the smallest supply for any one pre-war year.

TABLE 7.—PER CAPITA WHEAT SUPPLIES FOR IMPORTING AND SPECIAL EUROPE, PRE-WAR AND POST-WAR*

(Bushels)

Year ending July 31	Importing Europe[a]	Special Europe[b]
1907–14 average	5.57	5.36
1907–08	5.58	5.12
1908–09	5.10	4.95
1909–10	5.67	5.37
1910–11	5.41	5.28
1911–12	5.58	5.45
1912–13	5.87	5.75
1913–14	5.81	5.61
1921–24 average	5.27	5.13
1921–22	5.50	5.22
1922–23	4.88	4.80
1923–24	5.43	5.37

* Sources: *International Yearbook of Agricultural Statistics* and *International Crop Report*. Post-war population from League of Nations, *Monthly Bulletin of Statistics*, Vol. V, No. 7.

[a] Includes countries having a total population of 226 millions.

[b] Includes countries having a total population of 288 millions.

If due allowance is made for the fact that the methods of assembling the data (neglecting carryovers) tend to increase the year-to-year variations in per capita consumption, these figures give an idea of the constancy of European wheat consumption in normal times. Post-war levels of consumption are considerably lower than pre-war.

Imports have varied more than consumption. In the seven years before the war, the highest figure for net import was 187 million bushels above the lowest.

IMPORTANCE OF RYE IN EUROPE

Wheat is only one bread grain in Europe, and though the import of wheat greatly predominates over that of rye, in the total continental supply of bread grain rye is half as important as wheat, while north of the latitude of the Alps (disregarding the United Kingdom) the two grains are practically equivalent. In effect, Europe imports wheat to complete the bread-grain supply, not merely to complete the wheat supply.

Using again the special "Europe" previously defined, the average per capita annual bread-grain supply before the war was 472 pounds, of which 322 were wheat and 150 were rye. The highest annual per capita consumption was 499 pounds, or 106 per cent of the average; the lowest was 445 pounds, or 94 per cent of the average. The highest annual per capita consumption was 112 per cent of the lowest.

The 1924 rye crop of the present Europe is given provisionally as 663 million bushels. Before the war Europe was a net importer of rye to the extent of 30 to 40 million bushels a year. Last year, with the return of Russia to export, Europe imported from Russia some 43 million bushels of rye and from overseas in addition 40 million bushels. This season Russia has little rye to offer. Rye is in the "tightest" international position of any grain. German bakers find it necessary, or advantageous, to add American rye to domestic rye flour for urban use. The year's exportable surplus from North America, including old grain, is not over 60 million bushels. Accordingly Europe cannot make good the shortage in rye by importing more than this amount, and must rely rather upon imported wheat and substitution of domestic coarse grains and potatoes.

During the past three years the average per capita bread-grain supply of the special "Europe" was 413 pounds; the lowest, 385 pounds in 1922–23; the highest, 437 pounds in 1923–24. With the present estimations of the bread-grain crops, the present Europe would this year need to import 36 billion pounds in order to afford a bread-grain ration of 385 pounds, the lowest of the last three years; she would need to import 46 billion pounds of bread grains to supply a ration equal to the average of the last three years; and she would need to import 54 billion pounds of bread grains to secure a supply equal to the largest of the last three years. Assuming that 60 million bushels of rye represents the maximum possible import of rye, the amounts of wheat necessary to be imported to secure the bread-grain ration on the three levels of consump-

tion would be as shown in Table 8. Comparable figures for importing Europe would be, respectively, 528, 695, 799.

TABLE 8.—WHEAT IMPORTS REQUIRED IN 1924–25 TO BRING EUROPEAN BREAD-GRAIN CONSUMPTION TO VARIOUS LEVELS

Consumption level	Per capita consumption	Gross imports required
Post-war, 1921–24	*(pounds)*	*(million bushels)*
Lowest	385	540
Average	413	707
Highest	437	851

These figures for wheat imports necessary to provide a bread-grain supply on the three stated levels, may be compared with the estimates of importers' requirements made by various authorities, official and otherwise. The other estimates, cited below, were apparently based on considerations of wheat alone, and are thus not altogether comparable with figures reached by the foregoing methods.

VARIOUS ESTIMATES OF NET WHEAT IMPORT REQUIREMENTS COMPARED

Sir James Wilson in November forecast the import of 608 million bushels, more than sufficient to provide the lowest per capita bread-grain consumption of the past three years. The Department of Agriculture in November suggested a range of from 496 to 593 millions, the maximum figure being below the amount required to yield the lowest annual supplies per capita in the seven years before the war, and not much above the amount required to yield the lowest per capita supplies since the war. Broomhall's figure of 624 millions, while seemingly higher, should be compared not with net import figures, but with his own figures of shipments to Europe, which are considerably higher. On the whole, these authorities agree, in effect, that Europe's import requirements in 1924–25 will not be such as to bring the per capita consumption up to the average for the past three years, which is well below the pre-war average. It is clear that if 630 million bushels of wheat, the approximation we suggest, are imported, the European bread-grain supply for the season would be notably below the supply of last season, and considerably below the average of the past three years.

SPECIAL FACTORS AFFECTING IMPORT REQUIREMENTS

Such calculations as the foregoing suggest a wide range within which the actual requirements of Europe in the present crop year may lie. It is insufficient to consider the bare statistics. Before attempting to narrow the range, or to arrive at a specific estimate, it is necessary to consider several factors which affect the requirements of the current year. Six deserve special consideration, namely: (1) the lateness of the 1924 harvest; (2) the quality of the 1924 crops; (3) the availability of substitutes; (4) restrictions of consumption; (5) the price of wheat; (6) Europe's ability to finance imports.

(1) Late Harvests of 1924. As the result of the cold, wet summer, the 1924 harvests of wheat and rye were quite generally delayed in western and northern Europe. In view of this fact, stocks in the hands of importers and millers were scant; and with the postponement of harvests, scarcity was anticipated. This led to such rapid buying that for a time the volume of import somewhat exceeded the current needs of the continent, as was evidenced later by considerable reselling of wheat in the principal ports. Viewing the year as a whole, the late harvest means that if the 1925 harvest is neither late nor early, the 1924 crops will be used for somewhat less than a full year, whereas both the 1923 harvest and 1923–24 imports contributed something to the crop year 1924–25. This factor, while it has increased early imports, may make for no corresponding increase over the year as a whole.

(2) Quality Below Normal. The 1924 crop of bread grains of Europe was distinctly below normal in quality, as has already been noted. An unusual fraction of the grain is soft, wet, and unmillable, and the grain that is termed millable is below the average. The condition of the soft pale wheats of the western countries is poorer than the semi-hard red wheat of the Danubian and Balkan areas. In some years in Europe wheat is dry enough to go from threshing to milling directly. This year it was not fit to go to the mills for weeks.

It seems certain, however, that for many parts of Europe lowness of yield and inferiority in quality have been somewhat exaggerated. October weather was favorable for the maturing, threshing, and drying of bread grain. Consequently, the yields were slightly improved in quantity and the millability of otherwise moist wheat and rye improved to an indeterminable extent. The stated crop, as of January 1, is larger and more merchandisable and millable than was expected on October 1. Viewed as a unit, however, both weight and protein content of the crop are below normal. Possibly as much as one-sixth of the European crop of this year would last year have been called tail wheat.

The low quality of the European crop not merely increases the tail wheat for feeding; it also lowers the yield of normal flour; or, ground like normal wheat, the grain produces an abnormal flour. This upsets the blending formulas and disturbs the import programs of large mills. If Europe had the choice among imports, she would select quality to supplement her poor wheat; but since supplies are short, she is likely to utilize all types, including North American inferior grades. More than ever, Europe this year seeks high protein wheat. The net effect of the poor quality is definitely to raise import requirements above the statistical position, and to increase the amount of tail wheat available for animal feed.

(3) Substitutes for Bread Grains. The position of substitutes for bread grains has been discussed above (pp. 84–86). On the whole, the European corn crop is good, crops of oats and barley are only mediocre, the potato crop is large but of generally inferior quality, supplies of oil seeds are fairly abundant, and the sugar-beet crop is exceptionally large.

The large supplies of domestic sugar will not greatly affect cereal requirements, except as they increase the ability of sugar beet-growing countries to finance imports. Sugar-beet residues increase fodder, but not the kind that replaces cereals. The larger potato crops, however, despite the poor quality, are likely to reduce considerably the cereal requirements for food, as compared with last year. The availability of oil seeds will offset in some degree the deficiencies in grain crops.

It might relieve conditions in western Europe if the inhabitants of Hungary and the Balkan States were to increase consumption of corn and release wheat for western Europe. There are, however, a number of difficulties in the way—inertia of peasants, transportation difficulties, currency fluctuations, export taxes, and the recently stimulated taste for wheat. The drawing out of more corn there may possibly result in drawing out less wheat. The short crop in America, and the stagnation in the Balkans, throw Europe back on long-haul corn of the Southern Hemisphere.

Western European demand for fodder grains varies with the supply of oil seeds. Last year Russia furnished a considerable volume of oil seeds, and expectations are high again this season, as Russia has good oil-seed crops and is in dire need of foreign credits. To make up for scarcity and high price of corn in the foreign market, western Europe may further increase her importations of oil seeds, freely available from the large cotton-seed crop of the United States and in various tropical countries. If Europe is able, through freer importation of oil seeds during the winter, at comparable price levels, to divert a considerable amount of domestic coarse grains, directly and indirectly, for the relief of the wheat situation, a good deal may be accomplished toward lowering what otherwise would be the wheat-import requirements.

(4) Restriction of Consumption. Higher extraction in milling of bread grains represents a practicable adaptation to a short crop. France requires 78 per cent extraction in the milling of wheat. Higher extraction is being proposed and undertaken in other countries and may become quite general before spring. This means more flour and less grain offal, more bread and less milk. Within feasible limits of higher extraction, possibly 10 per cent may be added to the volume of flour secured from the crop sent to the mills. A questionnaire sent out over Europe during the past summer has elicited the fact that except in France the percentage of extraction in milling had declined practically to the pre-war

level. Hence, under the stringency of the present year, there is room for considerable reduction of requirements through general raising of the percentage of extraction.

Another method of stretching bread-grain supply is by the compulsory addition of potato or coarse grain to wheat and rye flour. This exists in France, has been proposed in other countries, and may become widespread by regulation (or adulteration) before the close of the crop year.

Peasants and city workers may be expected, however, to resist the return to gray or to adulterated flour, each group for its own reasons; and it is impossible to estimate how far these measures will be carried into practice.

Another possibility lies in restriction of the feeding of wheat and rye to domestic animals. Before the war, according to official government estimates prepared for the food administrations of the different countries, 10 per cent of the crop in the United Kingdom, 2 per cent in France, 3 per cent in Italy, and 10 per cent in Germany and Austria-Hungary, after subtraction of the seed, went to animals and industries. The figure for rye was considerably larger; in Germany 25 per cent of the crop of rye, after subtraction of the seed, went to animals and industries. The practice of using bread grains for animals and industries was prohibited or curtailed during the war, but since the war these restrictions on feeding bread grains to animals have been generally abolished. Up to date we have no information that such restrictions have been reimposed, except in France. Peasants are, therefore, at liberty to sell their low-quality wheat and rye or to feed them.

The price of grain will have much to do with the peasant's decision. In some parts of Europe, wheat that is barely millable is bringing a higher gold price than was secured last year for standard wheat. No. 6 Canadian spring wheat has latterly been sold in Liverpool for 145 cents per bushel, illustrating the comparable price of low-grade domestic wheat in Europe. The reactions of peasants will vary from section to section, depending on prices and availability of coarse grains, oil seeds, potatoes, sugar-beet residues, and other fodders, all evaluated locally in accordance with the particular position of animal husbandry. Probably the cumulative influence of the high price will be in the direction of a maximum marketing of wheat and rye, so far as they are millable. At present prices of wheat, the cost of grain offal in imported wheat is very high, and some parts of Europe will find it better to import wheat flour and oil cake rather than wheat.[1]

(5) High Wheat Prices. Without presuming to forecast the price of wheat through the remainder of the crop year, it can be taken for granted that wheat will remain very much higher than in 1922–24, and that it will be accounted distinctly high in price. This has a threefold tendency—to restrict food consumption, to keep to a minimum the use of millable wheat for feed, and to increase the plantings for next year's crop.

In continental Europe the price of flour follows the price of wheat and the price of bread follows the price of flour more closely than in this country, since European bread contains little more than flour, salt, and yeast, and costs of manufacture and distribution are small. Bread prices have not been fully decontrolled in Europe since the war. In several countries, particularly in municipalities more or less under the control of socialists, the price of bread has been under restraint, or at least subject to efforts at restraint. Although regulation of bread prices and loaf weights was abolished in Germany in October, these efforts at restraint of the price of bread have in general been intensified and extended by the higher prices of the recent months. Inquiries into bread prices are now quite the order of the day in European parliaments.

Agitations against a rise in the retail price of bread and enactments for the control of these prices influence importers' requirements, by interfering with the substitution of other foodstuffs for bread. They accelerate the trend in the directions of

[1] This tends to raise the price of "clear" flours from the United States, and these have been out of line upwards. The indications are that this year, as last, will see a heavy international trade in flour, though shipments in the Pacific and from Italy promise to be much smaller than last year.

higher extraction and use of stretching materials. They increase the hazards of bakers and millers. They introduce uncertainties into the statistical programs of importation. Importers who have been trying to get away from hand-to-mouth buying are likely to return to this opportunistic form of trading, rather than undertake long-term commitments and purchases for future delivery, at the risk of having the mills find the c. i. f. price[1] too high for the controlled price of bread. Government control of bread grain is reappearing under the stress of high prices. Prohibitions of export have been established in several countries, and even measures for government purchase and sale are being attempted. The extension of such control might have considerable influence on European demand for the year.

Certain of these activities clearly tend to counteract each other. The purpose of price control and of product specification is to reduce imports. On the other hand, artificial restriction of price tends to increase consumption by defeating the depressing effect of high prices on consumption, consequently favoring imports. This conflict between the domestic account and the international account may present a difficult problem for several countries in Europe. To attempt to hold down the price of domestic grain by control and at the same time to keep out imported wheat by tariff or other restriction at the frontier, is to aim at a reduced bread supply at a reduced price! And yet this is practically what has been attempted in France.

(6) Ability to Finance Imports. According to present indications, Europe's imports of bread grains, at the higher prices ruling in the current year, will cost perhaps 300 million dollars more than last year. This is no small item in the European balance of trade. Under conditions such as have prevailed in several years past, Europe's ability to finance food imports at such additional cost would have imposed narrower limits upon her actual imports, regardless of her statistical requirements.

[1] Trade abbreviation for "price plus cost, insurance, and freight."

Undoubtedly the cost of these imports is a limiting factor, and impels European countries to buy low-grade Canadian and American wheat at a discount under prices for standard quality grain. Nevertheless, it is clear that in financial resources Europe is distinctly better off than in any previous post-war year. Production and trade have recovered from much of the disorganization caused by the war and the subsequent financial crises. The bulk of Europe now has stable or fairly stable currency. The flow of capital and credit is much freer than it was. To a considerable extent business confidence has been restored. While conditions are by no means normal, in most countries, great gains have been registered in the past two years. The increased cost of grain imports will be partially offset by decreased cost of sugar and cotton imports, but in large measure will be covered by increased exports and by foreign credits often directly given to assist purchases of raw materials and finished goods. In some measure these imports will compete with imports of industrial materials, and hence will tend to retard industrial recovery. The ability to finance imports, however, seems unlikely to be important as an independent factor restricting European demand.

It is significant that in recent months sterling and certain other depreciated European exchanges which are not yet stabilized have risen in the face of exceptionally heavy grain imports, and that no country with stabilized exchange has found that stability jeopardized. Europe is fortunate in having the crop shortage occur at a time when her financial status has materially improved.

European Wheat Import Requirements Estimated at 600–660 Million Bushels

The foregoing discussion brings out the extraordinary difficulty of estimating European import requirements in the present year. The number of indeterminable factors is unusually large. The several influences of crop quality, of efforts to restrict consumption, of radical increases in prices, of possible changes in stocks, of Europe's ability to finance imports, are peculiarly difficult to gauge. The prospects next spring

for the coming harvest will have unusual weight. On this basis one can make but a reasoned guess, in the light of all these factors and of past experience.

A rational method of checking one's guesses is to consider, country by country, the reported crops and probable imports in the light of data for apparent consumption in previous years, supplemented by known facts concerning the present season.

Appendix Table II summarizes the quantities available for domestic use, disregarding carryovers, for leading importing countries in post-war years compared with a pre-war average, with rough estimates for the current year, on the basis of official data for wheat crops and reported imports. The estimates for 1924–25, with comparisons, are summarized in Table 9.[1]

TABLE 9.—AVERAGE WHEAT SUPPLIES AVAILABLE FOR DOMESTIC USE (DISREGARDING CARRYOVERS) AND NET IMPORTS IN LEADING EUROPEAN IMPORTING COUNTRIES, 1920–24, WITH ESTIMATES FOR 1924–25.

(Million bushels)

Country	Apparent domestic use		Net imports	
	Average 1920–24	Estimates 1924–25	Average 1920–24	Estimates 1924–25
Great Britain and Ireland	277.8	285– 295	214.2	230–240
Italy	276.8	261– 271	96.4	90–100
Germany	141.6	153– 163	49.4	60– 70
France	315.8	322– 332	46.0	40– 50
Belgium	50.3	49– 52	38.1	37– 39
Netherlands	29.1	29– 32	22.3	25– 27
Scandinavia	39.2	43– 46	18.4	28– 30
Switzerland	18.2	18– 19	15.0	15– 16
Austria	23.4	23– 25	16.3	14– 16
Czecho-Slovakia	49.1	46– 49	15.4	12– 14
Poland	44.8[a]	49– 51	1.6[a]	16– 18
Baltic States	11.4	14– 18	6.6	8– 11
Spain and Portugal	156.3[b]	139– 145	9.2[b]	5– 10
Greece	26.4	26– 29	15.1	17– 19
Total	1460.2	1457–1527	564.0	597–660

[a] 1921–24 average.
[b] Spain, 1920–23 average.

This summary leads to the conclusion that European net imports of wheat for the current crop year are likely to amount to between 600 and 660 million bushels, with 630 million as the probable figure. This would be considerably higher than the post-war average of net imports. It would, however, provide Europe with a total wheat supply little above the post-war average, and a per capita bread-grain supply decidedly below the average post-war amount, though higher than the lowest post-war figure, as shown by Table 8. We are disposed to accept this conclusion as reasonable, but it must be repeated that such estimates, always subject to a large margin of error, are this year especially difficult to make with confidence.

[1] The figures differ somewhat from those of Sir James Wilson as reported in *The World's Wheat, November 1924.*

EX-EUROPEAN WHEAT IMPORTS

Imports of wheat and flour into the Orient have been much lower than during the same period last year. In the months of August, September, and October, the net imports of Japan proper were only about a million bushels, as compared with 9 million in these months of 1923. To a certain extent, consumption of import wheat in Japan, China, and eastern Asia generally, is rather a luxury practice, outside of the Caucasian population, and this despite the fact that there is a large domestic wheat consumption in China. Shortage of fuel, or fuel poorly adapted to a sustained fire, makes for the use of cooked cereals instead of baked cereals. Rice and millet lend themselves to cooking better than does wheat. The chief uses of wheat in the Orient are in the form of paste and also as a steamed bread. Under these general circumstances, the use of imported wheat is a somewhat artificial practice that was for several reasons expanded during the war, and has since then been promoted by low prices of wheat. One will not go far astray in assuming that when the price of wheat rises relative to the prices of competing cereals in the Orient, the use of imported wheats may be expected to retreat toward the pre-war dimensions.

The particular reasons for the heavy import of wheat and flour into the Orient last season were discussed in our *Review of the Crop Year 1923–24.* At the opening of the present season, the Oriental markets were

well stocked.[1] The disorganization in China and hard times in Japan, consequent on the earthquake, together with the behavior of the yen, tend to discourage importation of wheat. The unusually heavy adverse balance of trade of Japan for 1924 will tend to restrict her imports in 1925. China needs cereals badly, but one does not see how she is to pay for or distribute large amounts of imported wheat. An increase of 50 per cent in the price of wheat tends emphatically to discourage imports. The crop conditions in general have not been markedly good or bad in Asia, apart from floods in northern China. The preliminary estimate of the Japanese wheat crop of 1924 was some 36 million bushels of mediocre quality. Other things being equal, the import requirements would be estimated at 20–25 million bushels. The price of rice is relatively high, but to the Oriental we may be sure the present price of wheat appears still higher. Before the war the average imports of wheat into Japan were only some 4 million bushels. Purchases for Japan and China to date, mostly in Australia, but to some extent in North America, suggest that the imports for the current year may not be much larger than the pre-war figure. Domestic wheat is cheaper than foreign wheat.

Wheat imports of ex-European countries, outside of Asia, are less influenced by price than is the case in Japan and China. The wheat demand in countries like the West Indies and the East Indies, Brazil, and South Africa is relatively stable, owing to characteristics of the climate and the habits of the importing population. While the imports of last season may not be maintained, the pre-war level of imports may easily be exceeded, despite the present high prices. Provisionally, we see no present reason for expecting the ex-European wheat imports (excluding North America) to exceed 90 million bushels, and they are more likely to be as low as 80 million.

IV. EXPORTS AND EXPORTABLE SURPLUSES

With this view of importers' requirements, we may turn to the position of exporters, and consider, for the crop year as a whole, the supplies potentially available for export and the outlook for actual exports, in the light of the movement that has already occurred.

It must be emphasized at the outset that the actual exports in the remainder of the crop year will depend somewhat upon the price, and to a considerable extent upon the reported condition, especially late in the crop year, of the new crops. The present wheat price level will tend to call forth from exporting countries quantities of wheat which at lower price levels would be variously consumed or carried over. This is especially true of the United States and of India. In Canada, Argentina, and Australia, domestic consumption calls for a smaller proportion of the crop, and the exportable surplus is calculable within narrower limits. If next year's crops in India, the United States, and Canada do not promise well, reserves will not be allowed to fall so low as if the outlook were good, and smaller exports will be forthcoming only at still higher prices. Assuming, for the time, the continuance of distinctly high prices for several months, we may inquire what quantities, in the different export areas, are likely to be available for export.

1924–25 World Exports Estimated

An examination of the supply situation in each of the important exporting countries leads to the tentative conclusion that on the basis of present crop estimates and in view of the present outlook, something like 725 million bushels of wheat could be exported this year without reducing domestic reserves to an apprehensively low level.

We have come to this conclusion after a detailed study of the supplies available in each of the important exporting countries and a comparison of the rate of export during the first five months of this crop year with the rate during similar periods of other recent years. Before attempting to

[1] See Wheat Studies, No. 1, p. 19.

build up the world exportable surplus country by country, it is advisable to discover what is the customary rate of export during the portion of the crop year that has elapsed, and how this year's performance compares with the usual.

Estimate Based on Actual Exports, August to December

During the first five months of the crop year 1924–25, the five leading exporters—United States, Canada, Argentina, Australia, and British India—shipped out 345 million bushels of wheat and flour, the largest exportation in this period for any post-war year. As is indicated in Table 10, and more fully in Table 20 (p. 102), the international movement from these countries in the autumn of 1922 was almost as large, but the trade of other years since the war, even that of last year when the Canadian crop was so heavy, fell considerably short of these proportions. Broomhall's figures for shipments, summarized in Table 19 (p. 101), lend support to this conclusion.

In ratio to annual exportation the movement in these months has ranged between 40 and 49 per cent. The highest figure represents the experience of 1922–23, the year most nearly comparable to the present one; the lower figure, that of 1920–21. In attempting to arrive at an estimate for total exportation this year, clearly the experience of 1922–23 is of more value than that of the other years considered. As already pointed out, the distribution of supplies in the two years is very similar. The pressure on the market was considerably greater this year, however, than it was two years ago. It seems safe to assume, therefore, that at least 49 per cent of this year's exports had been made by January 1. Estimated on that basis, total exportation from these countries in 1924–25 would be about 700 million bushels.

Table 10.—Wheat and Flour Exports of Principal Countries, August to December, 1920–24, in Comparison with the Crop Year as a Whole

(Million bushels)

Crop year ending July 31	Exports August to December	Exports August to July	Percentage in first 5 months
1920–21	259	654	39.6
1921–22	311	657	47.3
1922–23	342	699	48.9
1923–24	325	753	43.2
1924–25	345	704[a]	49.0[b]

[a] Derived figure.
[b] Estimated.

This estimate applies only to the five leading exporting countries. The situation in Russia and the Danube countries has been so unsettled during the period that no reliance could be placed upon an estimate for this year based upon the performance of the past five years. The indications are, however, that not much more will be obtained this year from these sources than was obtained in 1922–23, when 11 million bushels were exported.

This leads to the conclusion that total exports for the year might be expected to be about 715 million bushels. For comparison, Broomhall's recent estimates, with corresponding figures for shipments in three preceding years, are given in Table 11.

Table 11.—Broomhall's Estimates of World Shipments of Wheat and Flour, Compared with Reported Shipments 1921–24*

(Million bushels)

Export area	Shipments 1921–22	Shipments 1922–23	Shipments 1923–24	Probable shipments 1924–25
United States	404	455	454	264
Canada				168
Argentina and Uruguay	118	138	174	144
Australia	111	48	78	92
British India	—	26	17	40
Russia and Danube Basin	6	7	36	12
Other countries	8	2	15	
Total	647	676	775	720

* Source: Broomhall's *Corn Trade News*. Estimates for 1924–25 revised to January 13, 1925.

Maximum Probable Net Exports Estimated at 725 Million Bushels

Studying the problem by exporting countries individually, we come to approximately the same conclusion.

Our results are summarized in Table 12 (p. 96), in comparison with reported exports of the preceding years and the November estimates of Sir James Wilson and

the United States Department of Agriculture.

We conclude that the maximum probable net exports in the crop year 1924–25 will be about 725 million bushels, and that actual exports will fall not far short of this figure. This estimate is distinctly higher than the earlier estimate of the United States Department of Agriculture, but considerably below Sir James Wilson's November estimate of world exportable surplus.

TABLE 12.—ESTIMATED NET EXPORTS OF WHEAT AND FLOUR, 1924–25, COMPARED WITH ACTUAL EXPORTS 1921–24*

(Million bushels)

Export area	Reported exports 1921–22	1922–23	1923–24	Estimated exports, 1924–25: Food Research Institute	U. S. Dept. of Agriculture	Sir James Wilson
United States	262	202	128	250	200–225	224
Canada	194	280	343	175	170–190	200
Argentina	118	139	172	135	130–150	168
Australia	115	50	86	110	75– 85	108
India	(14) [a]	29	20	40	25– 35	72 [b]
Russia and Danube Basin	21	8 [c]	48 [c]	15	10– 20	16
Algiers and Tunis	6	3	10			12 [d]
Total	702	711	807	725	610–705	800

* Sources: *International Crop Report and Agricultural Statistics* for reported exports; Sir James Wilson, *The World's Wheat, November 1924*, and *Foreign Crops and Markets*, November 26, 1924, for estimated exports. Sir James Wilson's estimates are for exportable surplus. United States figures are for net exports, July through June; Canadian figures for exports, September through August; other figures for crop years, August through July. See also NOTE below.

a Net imports. *c* Excluding Bulgaria.

b Includes probable surplus from harvest to be gathered May 1925. *d* "Other countries."

NOTE.—The dates at which these estimates were made is a matter of considerable importance, since the situation is constantly changing. Sir James Wilson's was probably made up early in November. That of the Department of Agriculture was published in November. Broomhall's[1] and our own were made up in January.

There are also certain fundamental differences in the meaning of the estimates. Sir James Wilson's is an estimate of the world "exportable surplus," and represents the maximum amount of wheat statistically available for export from this year's supply. It may be far above the actual exports of the year. Broomhall's estimate presented here represents his notion of the shipments likely to be made, during the year, but he puts the world exportable surplus at 812 million bushels, or some 92 million greater than his estimate of probable exports.[2] Our estimate and that of the U. S. Department of Agriculture are of probable exports, not exportable surpluses, though our own figure is better termed "maximum probable exports." The Department has given a range in the case of each country; and these when aggregated reach a total for the world considerably under ours or Broomhall's. In arriving at our final estimate, we have not used a range, although the final estimate is merely the mean of a range.

Certain other peculiarities in the tables must be pointed out. In Table 13 the reported and estimated exports of the United States are for the American crop year ending June 30, those of Canada are for her crop year ending August 31, while the others are for the international crop year ending July 31. The totals, therefore, are only approximations of the exports for the international crop year. This seemingly inconsistent policy has been followed because of the difficulty of estimating how much the United States will export next July, when a new and unknown crop will be on the market. Broomhall's figures are for the international crop year throughout.

Sir James Wilson believes (with Broomhall) that the American official trade statistics include much Canadian wheat in transit. This probably accounts in part for his relatively low estimate of the exportable surplus from this country. His very high estimate for India implies that he expects her to export very heavily—much more heavily than most observers think likely—in the months immediately following her 1925 harvest.

ESTIMATES COUNTRY BY COUNTRY

United States. If the American crop is not underestimated at 873 million bushels, it seems probable that wheat reserves will have to be pretty well drawn down by the end of the year to permit an export of 250 million bushels, the round figure we have used. In view of the price situation this

[1] See Appendix Table III for a summary of Broomhall's estimates since August 1.

[2] His total for the world exportable surplus agrees roughly with Sir James Wilson's, but his estimates country by country do not.

export does not seem improbable. In Table 13 our estimates of the disposition of this year's American crop are put down in detail.

TABLE 13.—UNITED STATES WHEAT SUPPLIES AND THEIR DISPOSITION*

(Million bushels)

	Approximations 1921–22	1922–23	1923–24	Estimate 1924–25
Stocks, July 1	94	81	102	103
New crop	815	868	797	873
Supplies	909	949	899	976
Seed use	93	89	78	85
Feed and waste	471	555	94	45–55
Domestic milling			496	525
Stocks, June 30	81	102	103	60–75
Net exports, wheat and flour	262	202	128	235–260
Exports, July 1 to Dec. 31	190	134	84	178
Available for export, Jan. 1	72	68	44	57–82

* Based on official data for 1921–22, 1922–23, and 1923–24. Estimates for 1924–25 based so far as possible on official returns.

We have accepted the official estimate of the crop and carryover, and on that basis have a supply figure of 976 million bushels. Of this, 85 millions must be allowed for seed. By January 1, 178 million bushels of wheat and flour had left the country. The principal unknown elements of the problem are domestic consumption during the year and the reserve at the end. It is assumed that the remainder will be exported. Since domestic grinding has been at a high rate during the early months of the crop year, we have increased last year's estimate for milling by about 30 million bushels. On the other hand, we have decreased last year's feeding estimate (which was possibly too high) by a large percentage on the theory that, in spite of the poor corn crop, high wheat prices will greatly restrict wheat feeding this year. On this basis we still had for export, on January 1, 75 million bushels, more or less. If we export more than this, reserves will be extremely low at the end of the year. Of this total, at least half, in our opinion, may be exported in the form of flour.

NOTE.—The figure of 525 million bushels of wheat for estimated grindings for domestic consumption requires an explanation. It is of course a guess, but in the present condition of milling nothing else is possible. The monthly census of flour milling began July 1, 1923, and the data for the single year are not sufficient to afford the basis for estimating seasonal variation. The estimated grindings of that year, for exports and domestic consumption, were 574 million bushels, regarding the reporting mills as 82 per cent of the total. Of this, 36.4 per cent was ground in July–October. In July–October, inclusive, 1924, the grindings were 217 million bushels, regarding as accurate the census estimate that the reporting mills constitute 82 per cent of the total. If we estimate this 217 million bushels as 36.4 per cent of the total figure-to-be, as was the case last year, we suggest 1924–25 total grindings of 596 million bushels. Estimating the wheat exported in the state of flour as 70 million bushels, 526 million bushels would measure the grinding for domestic purposes. This is nearly 30 million bushels higher than last year's estimated consumption, a not abnormal increase. If mill operations for this year show less than the seasonal variation of last year, the final figure for grindings will be over 596 million bushels.

It is possible that under the conditions of rising wheat prices, high freight rates, and relative scarcity of wheat east of the Mississippi and west of the Rocky Mountains, the grindings of the reporting mills are more than 82 per cent of the total. This would mean that the census figure for total grindings would be higher, by an indeterminable amount, than the real figure.

Flour stocks on July 1 were regarded as low to moderate. There is evidence that some of the large baking concerns not only have contracted ahead for flour, but have accumulated certain stocks in advance of rising prices, and this receives some confirmation in the lag in the price of bread. There are no obvious indications that small bakers or households have stocked up on flour in anticipation of rise in price. Flour stocks are believed to be light in the distributing trade and light in the hands of millers, a hand-to-mouth relationship persisting between these two groups.

Nevertheless, there is the possibility that stocks have accumulated to some extent during the autumn months. With rising prices and the general public convinced of the persistence of the trend, some retailers and households may have laid by a few bags or barrels of flour. There are supposed to be something like 250,000 retailers of flour in the United States. Home baking is still supposed to use practically half the flour that goes into bread. A small accumulation, scarcely perceptible to mills and wholesalers, may have occurred during the first five months of the year, the effect to appear in reduction of demand at some time during the spring.

The effect of these two factors would both be in the direction of lowering the estimate. On

the other hand, there seems to be a general feeling that consumption of flour during this year has been on a distinctly higher level than last year. There is a general conviction in the milling trade that weekly flour grindings are passing directly into consumption, and that the business is on a hand-to-mouth basis which is expected to continue through the year. We have attempted to evaluate these guesses, and in a purely tentative manner have set down 525 million bushels as the wheat ground for domestic consumption; and in the exportable surplus of 250 million bushels are included some 70 million bushels exported in the state of flour.

The rate of marketing thus far this year has been far more rapid than in any of the war or post-war years. Receipts at primary markets (which constitute by no means the total marketing), from July to December, amounted to about 45 per cent of the year's crop, whereas the largest comparable figure for earlier post-war years was 34.[1]

Canada. Our estimate of the Canadian export is based primarily on an official estimate published November 19 by the Dominion Statistician. At that time there was considerable divergence of opinion as to the size of the crop and consequently of the exportable surplus; and since then the government has lowered its estimate of the crop by 10 million bushels. Nevertheless, in our opinion the distribution estimate of November 19 still appears substantially correct. We have decreased probable exports from 180 million to 175 million and have lowered the estimates of feed use and carryover at the end of the year. Otherwise the estimates in Table 14 below agree with those published by the Dominion Government last November.

On the basis of a supply of 290 million bushels (of which 28 was carryover), an export of 175 million bushels seems reasonable. The exportation in the early months of the year was somewhat behind this rate, but exports in December were heavy. Between September 1 and January 1, 99 million bushels of wheat and flour had been exported. Allowing for reserves of only 10 million bushels at the end of the crop year, this will permit a further exportation of 76 million bushels between January 1 and September 1, 1925.

The Canadian crop was late to be harvested, and consequently the marketing movement was delayed. By January 1, 111 million bushels, or 42 per cent of the crop, had been received at the head of the lakes. This compares with a marketing of 46 per cent of the crop in the same period of 1923, 48 per cent in 1922, and 40 per cent in 1920 (when the crop was more nearly comparable in size with this year's).[2]

TABLE 14.—CANADIAN WHEAT SUPPLIES AND THEIR DISPOSITION*

(Million bushels)

	Approximations 1921–22	1922–23	1923–24	Estimate 1924–25
Stocks, Sept. 1	8	16	12	28
New crop	301	400	474	262
Supplies	309	416	486	290
Seed use	39	40	38	38[a]
Feed and waste	23	44	34	25
Domestic milling	37	41	42	42[a]
Stocks, Aug. 31	16	12	28	10
Exports, wheat and flour	194	280	343	175
Exports, Sept. 1 to Dec. 31	94	162	176	99[b]
Available for export, Jan. 1	100	118	167	76

* Approximations by Dominion Bureau of Statistics for 1921–24, and their official estimate of November 19, 1924, for 1924–25.

a Domestic milling and seed use estimated together as 80 million by Dominion Statistician. The separation is ours. We regard both figures as slightly low.

b As reported officially September through December.

The midwinter exports are likely to be relatively light because grain dealers, fearful of the policies of the wheat pool, did not build up the usual stocks at the eastern lake and seaboard terminals. Therefore, except for Canadian wheat in transit in the United States, Canadian exports may be low until lake navigation reopens.

Argentina. The estimates for Argentina are more tentative than those for North America, partly because all estimates are less dependable, partly because there is no official estimate of stocks as of August 1. We have used figures for past stocks obtained chiefly from Sir James Wilson's es-

[1] See Appendix Table V for details.

[2] See Appendix Table IV for weekly receipts of wheat at the head of the lakes.

timates, with certain adjustments. The 1924 crop figure is the current official estimate. It is fair to say that there is a notable divergence between the government estimate, the estimates of Le Count, an American expert on the ground, and those of Broomhall. We have raised somewhat the estimate for domestic use, to compensate for shortage in the crops of corn, oats, and flaxseed. The figure for exports from August 1 to January 1 is official. British buyers have made heavy advance purchases of Argentine wheat for February delivery.

TABLE 15.—ARGENTINE WHEAT SUPPLIES AND THEIR DISPOSITION*

(Million bushels)

	Approximations 1922–23	Approximations 1923–24	Estimate 1924–25
Stocks, Aug. 1	51	42	54
New crop	196	247[a]	191
Available supplies	247	289	245
Domestic use	66	63	70
Stocks, July 31	42	54	40
Exports	139	172	130–140
Exports, Aug. 1 to Dec. 31	33	34	30
Available for export, Jan. 1	106	138	105

* Official statements of crops and exports. Stocks obtained by adding to Sir James Wilson's estimates of exportable surplus for August 1, 1922 and 1923 (respectively, 32 and 24 million bushels), and to Broomhall's estimate for August 1, 1924 (36 millions), 5½ of estimated annual use less allowance for seed.

[a] The revised figure of 257 millions was received too late to be used in this table.

On the whole, an export of 130 to 140 million bushels for the year ending July 31 seems probable. Of this about 105 would seem to be available for export after January 1.

Australia. The Australian crop is now estimated at 162 million bushels, and the crop is of excellent quality. Feed conditions are such as to permit a maximum export, and the stocks as of August 1 are reasonably known. With stocks of 27 million bushels and the new crop of 162 million, domestic use of 49 million, and outgoing stocks of 30 million, Australia has 110 million bushels to export for the year ending July 31. Exports to January 1 are estimated at 16 million bushels, leaving 94 million bushels to go out in the next seven months, an easy operation when one considers the numerous harbors of Australia and their loading facilities. Charters for movement of Australian wheat have been contracted for on a heavy scale, indicating prompt and large movement after the first of January.

TABLE 16.—AUSTRALIAN WHEAT SUPPLIES AND THEIR DISPOSITION*

(Million bushels)

	1922–23	1923–24	Estimate 1924–25
Stocks, Aug. 1	23	33	27
New crop	109	126	162
Supplies	132	159	189
Domestic use	49	46	49
Stocks, July 31	33	27	30
Exports, wheat and flour	50	86	110
Exports, Aug. 1 to Dec. 31	9	22	16
Available for export, Jan. 1	41	64	94

* Official statement of crops and exports. Stocks obtained by adding to Sir James Wilson's estimates of exportable surplus (respectively 8, 16, and 12 million bushels), 5½ of estimated annual domestic use less allowance for seed.

India. Exports from India are especially problematical. Sir James Wilson in November estimated net exports of 72 million bushels, Broomhall estimates shipments of 40 million bushels for the crop year, the Department of Agriculture 25–35 millions. Basic data for consideration are shown in Tables 17 and 18 (p. 100).

Before the war India exports averaged 50 million bushels from an average crop of 352 million. During the war, however, wheat consumption increased, and consumption since has averaged higher than before the war. In the past two years prosperity in India and low prices for wheat have continued to stimulate domestic consumption. At the average consumption for the past two years, India's export surplus would be only about 20 million bushels. This year, while prosperity continues, high wheat prices make for reduced consumption and heavier exports. Provided next year's crop promises reasonable yields, the

level of domestic consumption may permit export of as much as 45 million bushels, and is likely to permit export of at least 30 million; but this is contingent upon the new crop outlook. According to Sir James Wilson, on August 1 the exportable surplus from the 1924 crop was 48 million bushels.

TABLE 17.—INDIA'S WHEAT CROP, EXPORTS, AND AVAILABLE SUPPLIES*

(Million bushels)

Year	Crop	Net export	Available supplies
1909–14 average	352	50	302
1919–24 average	329	10½	318
1919–20	280	2	278
1920–21	378	15	363
1921–22	250	(14) [a]	264
1922–23	367	29	338
1923–24	369	20	349
1924–25	364	40 [b]	324 [b]

*Source: See WHEAT STUDIES, No. 1, Appendix Tables I and X.
[a] Net import.
[b] Estimated.

TABLE 18.—INDIA'S NET EXPORTS OF WHEAT AND FLOUR, APRIL–OCTOBER, CROPS OF 1921, 1923, 1924*

(Thousand bushels)

Period	1921	1923	1924
April 1–July 31			
Wheat	2,566	18,267	12,013
Flour	1,726	825	1,158
Total	4,292	19,092	13,191
Aug. 1–Oct. 31			
Wheat	(581) [a]	3,429	8,779
Flour	798	726	692
Total	217	4,155	9,471
Grand total	4,509	23,247	22,662

*Source: *International Crop Report and Agricultural Statistics.*
[a] Net import.

Recent export figures tend to confirm expectations of the heaviest post-war export. Beginning with July, India's net exports have run higher than in 1921 or 1923, both years of good crops, evidently in response to high export prices. For the first seven months of India's crop year, the 1924–25 exports of wheat and flour were 22½ million bushels, as compared with 26 millions of net export in the entire crop year ending March 31, 1924, when prices were much lower. A net export of 40 million bushels for the year would leave domestic supplies above the average of the first five post-war years, but lower than those of the past two years.

Other Exporting Countries. Of the four Danubian countries normally classed as exporters—Roumania, Bulgaria, Hungary, and Jugo-Slavia, only Jugo-Slavia had a favorable crop last summer. Hungary, however, in spite of her small crop, has shipped a good deal of wheat and flour to Czecho-Slovakia and some to Poland and other countries; while Jugo-Slavia, in order to improve her trade balance, has exported to the limit. She has abolished her export duty on flour and has reduced it for wheat. The Bulgarian government on October 31 prohibited export, and is now importing wheat. Roumania, by doubling the tariff, has practically prohibited export. Russia, instead of exporting wheat, in accordance with predictions early in the season, is importing it. The net export movement from these countries up to November 1 was about 11.5 million bushels, according to official trade reports. Broomhall in his reports of shipments disagrees with these figures and estimates that only about 4.5 million bushels had been shipped from this region by January 1. Obviously an estimate for the year as a whole is difficult to make in view of the conflicting reports.

Those countries that were exporting fairly heavily early in the year had about ceased by January 1. It was even predicted that they would all be importing before the season is over. Russia may have import requirements of appreciable dimensions. In view of the uncertainties of the situation, we have allowed 15 million as the net export for the entire group of countries, considering this, however, a maximum figure. If Russia is forced to import for seeding, as was recently reported to be probable, this figure might have to be considerably reduced.

We have made no allowance for export from Northern Africa. French Morocco has exported only very small amounts thus far, while Algeria and Tunis are likely to be net importers rather than net exporters.

Heavy North American Shipments Feature the Period

As already indicated, there has been an extraordinarily heavy international trade in wheat during the first five months of the crop year. According to Broomhall, total shipments from all exporting countries were 12 million bushels heavier between August and December of this year than in the same months last year, and the movement then was considerably heavier than in earlier years. From October 11 to November 15, six weeks, the average weekly shipments to Europe were over 18.4 million bushels per week, a record in history. This rapid movement is to be accounted for by the pressure of continental countries for foreign wheat to compensate for the real or anticipated deficiencies in their own crops and in Canada. Table 19 shows the volume of shipments from leading exporting areas during the first five months of the crop year and their general destinations, as reported by Broomhall in *Corn Trade News*.

Table 19.—Broomhall's Estimates of International Shipments of Wheat, Pre-War and Post-War, for the Period August 1 to December 31*

(Million bushels)

Export area	5-yr. ave. 1909–13	1920	1921	1922	1923	1924
North America	98.5	199.9	216.2	239.1	206.8	241.6
Argentina and Uruguay	14.9	9.8	9.8	32.6	34.8	32.8
Australia	12.3	8.2	35.2	7.8	17.4	14.8
Russia, Danube and Black Sea	121.4	.1	2.5	2.6	25.8	4.8
British India	17.2	1.7	.2	3.8	5.4	15.6
Other countries	4.5	—	5.2	—	7.8	—
Total	268.8	219.7	269.1	285.9	298.0	309.6
Destination						
Europe	235.4	205.4	225.9	248.9	238.4	276.8
Ex-Europe	33.4	14.3	43.2	37.0	59.6	32.8
Percentage of year's total						
Total	43.2	37.2	41.6	42.3	38.5	43.0[a]
Europe	37.8	34.8	34.9	36.8	30.8	38.4[a]
Ex-Europe	5.4	2.4	6.7	5.5	7.7	4.6[a]

* Source: Broomhall's *Corn Trade News* The figures are totals of weekly shipments for the 22 weeks most closely approximating the period August 1 to December 31 in each year.

[a] Percentage of Broomhall's estimate of 720 million bushels.

As the table shows, North American shipments account for four-fifths of the trade of the period, and those from the United States probably for one-half. The American crop was harvested early, while the Canadian was not only poor but late in reaching the market. As a result, the early shipments from North America were mostly of United States origin. By November and December, however, Canadian exports had increased almost to the United States figures.

The official United States and Canadian trade returns agree only roughly with Broomhall's reports of shipments from North America. Canada, for instance, reports as exported at the time it crosses the border, wheat leaving her territory for Europe via United States ports; but this same wheat may not appear in Broomhall's reports of shipments until some weeks later when it leaves the Atlantic port.[1] Other differences, obscure and difficult to segregate, make it impossible to harmonize the two sets of figures. In Table 20 (p. 102) the official trade returns of the leading exporting countries for the first five months of this year are compared with those of other post-war years.

Large Visible Supplies as of January 1

In connection with the export outlook, it is pertinent to consider the size of wheat and flour stocks on January 1. Unfortunately statistics of stocks are too imperfect to permit close comparison or analysis.

World visible supplies ordinarily reach their peak about the turn of the year. This year the December 1 figures were of record size, disregarding figures swollen by war stocks. Indeed, for the past two years, world visible supplies have tended upward, each month recording a higher figure than the same month of the year before. Broomhall's figures for December 1, with comparisons, are given in Appendix Table III. This year's increase is largely in the United States, east of the Rocky Mountains, and in

[1] Cf. Wheat Studies, No. 1, p. 35.

some degree in Great Britain and afloat for orders. Canadian stocks, and United States west of the Rockies are relatively low.

Recently the tendency to increase stocks has been reversed. Weekly data show that the maximum this year was reached late in November, and that in December a considerable decline took place, contrary to the usual seasonal tendency. Bradstreet's figures for North American, British, and floating stocks, given below, in million bushels, illustrate quite clearly the recent movement in contrast with changes in corresponding periods of the previous three years:

	1921–22	1922–23	1923–24	1924–25
Nov.—last week	191.4	197.0	247.2	261.6
Jan.—last week	178.3	190.6	252.8	233.8
Percentage change	−6.8%	−3.2%	+2.3%	−10.6%

The recent reduction occurred both in the United States and in the "U. K. and afloat" stocks, and the increase in Canadian stocks was too small to offset the decreases elsewhere. Although visible supplies remain large, the decline is significant, and it is undoubtedly related to the pronounced upswing of prices in December.

The present large visible supplies facilitate the handling of milling and export contracts, but their existence in no way contradicts the evidence of a stringency in wheat supplies for the year as a whole. Broadly speaking, stocks are low in Russia, Spain, Italy, and the Balkans, and moderate in the rest of continental Europe. Farm reserves are quite low in the United States, considering the size of the crop and the time of the year. Invisible supplies of flour are considered moderate. High figures for visible supplies have a very different meaning when farm reserves are low instead of high. One must always consider the visible wheat with reference to what is behind it. There is, therefore, reason to expect a

TABLE 20.—NET EXPORTS OF WHEAT AND FLOUR FROM PRINCIPAL EXPORTING COUNTRIES, AUGUST TO DECEMBER, PRE-WAR AND POST-WAR*

(Million bushels)

Year	Total	United States	Canada	Argentina	Australia	British India
1909–13 average	158.8	57.7	52.3	17.4	12.6	18.8
1920	259.0	136.5	97.4	11.0	11.1	3.0
1921	311.1	160.4	109.8	9.0	38.7	(6.8) [a]
1922	341.8	118.7	176.1	33.1	9.2	4.7
1923	324.8	72.8	189.9	34.1	21.9	6.1
1924	344.8	172.1	109.7	30.5	15.6	16.9
Months, 1924						
August	49.0	21.0	11.0	8.4	5.6	3.0
September	63.7	38.9	14.6	5.2	3.4	1.6
October	85.3	53.1	19.4	5.9	2.0	4.9
November	77.9	34.8	31.1	3.8	2.8	5.4
December	68.8	24.3	33.6	7.0	1.9	2.0

* Sources: U S., *Monthly Summary of Foreign Commerce of the United States* and figures from the Dept. of Commerce; Canada, pre-war, *International Yearbook of Agricultural Statistics*, and post-war, *Report on the Grain Trade of Canada* and *Canadian Grain Statistics;* Argentina, Australia, and British India, *International Crop Report* supplemented by *Crops and Markets* for latest figures.

[a] Net imports.

TABLE 21.—PROBABLE EXPORTS, JANUARY TO JULY, 1925*

(Million bushels)

Export area	Estimated exports 1924–25	Exported Aug.–Dec. 1924	Probable exports Jan.–July 1925
United States	250	172	78
Canada	175	110	65
Argentina	135	30	105
Australia	110	16	94
British India	40	17	23
Other countries	15	12[a]	3
Total	725	357	368

* Based on data in Tables 12 and 20. Figures for the United States and Canada are not entirely comparable with the others, since exports for the year are estimated for crop years ending June 30 and September 30, respectively.

[a] Estimated.

marked decline in visible supplies in the next few months, by far more than the usual seasonal amount.

Estimated Exportable Surplus, January 1, 1925

If it is accepted that 725 million bushels is a fair estimate of the maximum probable exports for the year, it may be concluded that on January 1 there were still available for export out of the 1924–25 crops some 368 million bushels. If our estimate is high, the latter figure must be reduced. It is highly improbable, however, that the exportable surplus was less than 350 million bushels on that date. Table 21 (p. 102) summarizes our conclusions.

V. THE UPWARD COURSE OF PRICES

The discussion of import requirements and exportable surpluses makes abundantly clear the causes of the striking increase in wheat prices between June and December, 1924. In part the increase represents a reaction from the abnormally low wheat prices of 1923–24, which were occasioned by bumper crops harvested in the face of a fairly weak European demand. For this reason, rising prices in 1924–25 would have accompanied a crop of normal size. The exceptional strength of the rise was due to the harvest of a crop below normal in size, and even more deficient in quality, occurring simultaneously with poor crops of leading wheat substitutes and with improvement in Europe's financial position and power to command wheat imports. A year of excessive supplies has been followed by a year in which the supplies can be stretched to meet requirements only at a price which attracts to market almost the maximum amounts available and restricts European requirements to a relatively low figure. The rise in prices is the more impressive because it has occurred in the months when usually, in North America and in Europe, wheat prices sink to the lowest level for the year.

For so pronounced a shift in position there are practically no precedents. Accordingly, there has been no safe basis for judging the level which wheat prices would reach,—either the relative strength of the price factors or their net effect. Hence the price increase has been interrupted by frequent recessions, in which the strength of the bullish forces has been repeatedly tested. At the price bulges, longs have sold for profits; at the price breaks, Europe has bought for import. The adjustment between the year's available supplies and requirements has been so close that prices have been exceedingly sensitive to new developments even of small dimensions. The higher the price, the wider have been the fluctuations and the more sensitive the market.

In this section we undertake to measure the extent of the rise in leading markets, to account for the short time fluctuations that have interrupted the general upward trend, to interpret the variation from one market to another, to touch upon the peculiarities in continental prices, and to appraise the outlook for prices in coming months.

Price Increases of 50 to 75 Per Cent

The upward movement of prices began well before the crop year opened, generally in May; and the rise was continuous through the ensuing months of the year. The following average monthly values of exported wheat, in cents per bushel, as reported by the Bureau of Foreign and Domestic Commerce, give a smoothed-out curve of the price increase in the United States:

June	July	Aug.	Sept.	Oct.	Nov.	Dec.
116	125	135	136	151	157	161

Table 22 (p. 104) summarizes the net change over this period, for leading grades in the chief exporting markets and in Liverpool, while weekly data are given in Appendix Table VII.

In the last week of May, prices in the leading exporting countries were not much

above a dollar a bushel, except for American spring wheat. In the seven months following, they advanced to about $1.76 a bushel or roughly 65 per cent. The rise has been greatest in those types of wheat that have been relatively scarcest,—namely, American red winter and high grade Canadian spring. It has been least in American spring wheat, which shifted from a "protected" to a competitive basis in the course of the period. In Liverpool, the increase was of comparable dimensions. An average of the prices of Canadian, American, Argentine, and Australian wheat quotations in that market for the last week of May comes to $1.26 a bushel, while a similar average for the last week of December is $1.99, indicating an increase in prices there of 58 per cent.

TABLE 22.—INCREASE IN WHEAT PRICES IN LEADING MARKETS, MAY TO DECEMBER, 1924

(Dollars per bushel)

Markets and grade	Last week in May	Last week in Dec.	Net increase
United States			
Farm price[a]	$ .97	$1.41	45%
No. 2 Hard, Kansas City	1.08	1.71	58
No. 2 Red, Chicago	1.09	1.86	71
No. 1 Dark Northern, Minneapolis	1.32	1.79	36
Canada			
No. 1 Manitoba, Winnipeg	1.05	1.86	77
Argentina			
Barletta, Buenos Aires	1.04	1.59[b]	53
Great Britain			
No. 1 Manitoba, Liverpool	1.23	2.07	68
Argentine Rosafé, Liverpool	1.21	1.96	62
Australian, Liverpool	1.28	1.96	53
Pacific White, Liverpool	1.31	1.95	49

[a] For 15th of the month.
[b] For second week in December.

While these and monthly prices show the extent of the rise and make possible a comparison of the prices of specific types of wheat in exporting and importing markets, more frequent quotations are necessary to follow the price trends in detail. For this purpose, Chart I has been prepared from daily quotations for wheat of the "nearest" future delivery in Chicago, Winnipeg, Buenos Aires, and Liverpool. In general, the future contract calls for the delivery of wheat of at least No. 3 grade, with adjustable premiums or discounts.

PRICE SWINGS EXPLAINED

Although the rate of increase in prices has differed somewhat from center to center, the up-swings and down-swings have usually been coincident in the principal wheat markets. Throughout this period conditions in the Northern Hemisphere have been of predominant importance. In the period immediately following the turn of the year, the Southern Hemisphere supplies are likely to dominate the market.

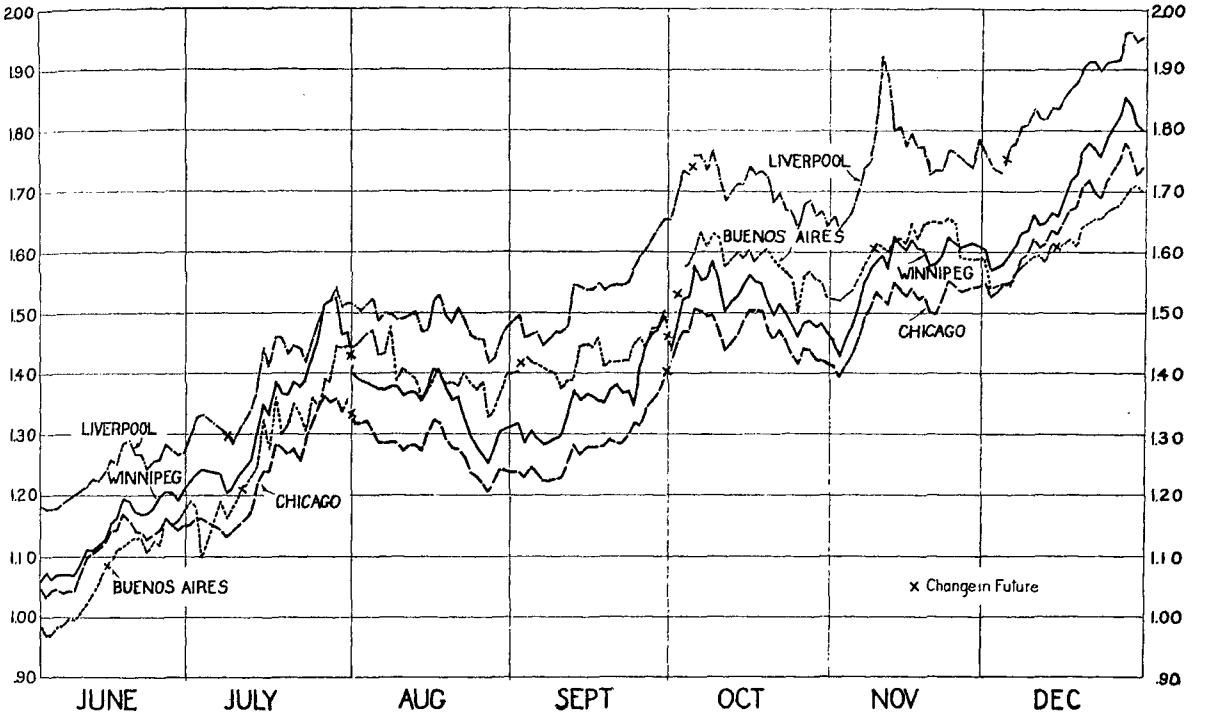
As the chart shows, the advance in prices was pretty consistent in all markets from the second week in June until the last week in July. During August there was a slump (most severe in Winnipeg and Chicago), followed in September and early October by a much more than compensating advance. The second week in October witnessed a definite "break," succeeded by a declining market until early November, when after the American election the market advanced strongly for a number of days. About November 10, another break occurred in the Liverpool price, but exporting markets were largely unaffected. The Chicago future quotation closed the month 19 cents higher than it was at the beginning. During December prices advanced fairly steadily in all markets, although less in Argentina than in the other three.

The rise in June and July was mainly the result of poor crop prospects. The June forecast of the United States Department of Agriculture, predicting a crop about 100 millions of bushels smaller than last year's, gave the market its first impetus. In the course of the next few weeks it became apparent that American conditions were much better, but developments elsewhere much less satisfactory. In Canada, early conditions were unpromising because of the late spring and consequent reduction in planted acreage, and in July drought developed on a serious scale. In southern Europe and Russia, as early as May, drought caused serious damage, while in the northern portion of the continent the weather later was too cloudy and rainy for the good of the crops. Large stocks from

the preceding crop were insufficient to meet the prospective deficit. It was because of these facts that prices, instead of "breaking" when American conditions were found to be better than anticipated, rose fairly steadily until the end of July.

CHART 1.—FUTURE PRICES OF WHEAT IN PRINCIPAL MARKETS, DAILY, JUNE–DECEMBER, 1924*

(U. S. dollars per bushel)



* Sources: Winnipeg and Chicago prices from *Chicago Journal of Commerce;* Buenos Aires and Liverpool prices from *Journal of Commerce,* New York. Quotations for the nearest future.

In August, the American crop came on the market in huge volume. It was then clear that the winter wheat crop, especially that of hard wheat, was not only large but of good quality. In that one month 93 million bushels were delivered at primary markets, the largest monthly movement on record.[1] Although there was active buying on the part of foreign and domestic interests, prices slumped under the burden of supplies.

The strong upward movement in September was the outcome of frantic European buying, which set in when it was found that the quality of practically all the European crops was poor, that the grain was too wet for immediate use, and that the total world supply, because of the poor Canadian crop, was going to be less than had been anticipated. This upward movement was halted by the continued marketing of immense quantities of American wheat—82 millions were delivered at primary markets in September and 88 millions in October—combined with the fact that European crop conditions showed some improvement. The German Government reported the crops there as not so damaged as had been anticipated, while in France two unofficial crop estimates were issued which placed national output well above the official figure. By this time, the Canadian marketing movement was also under way and added further to the volume of current supplies,[2] and imported grain was abundant in European ports. Under

[1] See Appendix Table V for monthly receipts of wheat at American primary markets.

[2] New crop Canadian wheat began to be marketed in the last week of September. Appendix Table IV shows the rate of the movement.

these conditions European millers hesitated to buy foreign wheat at current prices; some European importers were forced to resell at lower prices much they had already bought, and their buying for immediate and future delivery declined. August exports from the United States and Canada amounted to 32 million bushels. In September this was increased to 54 millions, while the October exportation was 72 million bushels.

Between October and November, there was no important change in the statistical position, except that it became evident that the Argentine crop had suffered seriously from drought. The American election, however, was the signal to enter the market for many domestic buyers who had refrained from committing themselves. Europeans also renewed their earlier buying. In response to these influences and increased speculation in other lines, which unquestionably had a psychological effect on the wheat market, the American price was advanced 14 cents a bushel in 5 days, the other markets following. As a month earlier, a serious break followed in the Liverpool price when it was apparent that more supplies might be available than would be required. In the exporting markets, however, and especially in Argentina and Canada, prices rallied quickly because of the scarcity of their wheats. Receipts at American primary markets in November amounted to 60 million, at Fort William and Port Arthur to 43 million. American exports during the month were not so large as in October, but nevertheless totaled 35 million bushels. Canadian exports were 31 million bushels.

With the closing of lake navigation and bad weather throughout much of the wheat belt, the North American marketing movement declined greatly in December. At the same time shipments from the Southern Hemisphere had not got under way on an appreciable scale, and European demand, though less active in certain directions than it had been earlier in the season, was increased by buying on the part of Russia, Bulgaria, and other countries, which are normally classed among wheat exporters. These factors, combined with no improvement in the underlying statistical position which had not already been discounted in the market, pushed prices to the highest point of the season. The December crop estimate of the United States Department of Agriculture increased the last previous estimate by 17 million bushels, making a total output of 873 million bushels; but as the trade had anticipated a revision by at least this amount, its publication had practically no effect on the price. Nor did the announcement of an increase of 6½ per cent in the acreage planted to winter wheat in the United States. Toward the end of the month, however, there was a fairly pronounced break, probably attributable to profit-taking by speculators.

American Prices Below Canadian and Argentine Parity until December

In marked contrast with the situation last year, when American prices were pretty consistently above those of her competitors, during the first four months of this crop year they were lower than Canadian or Argentine prices.[1] The premium in favor of American spring wheat, as compared with Canadian, which resulted from shortage and tariff protection last year, was wiped out by August this year. Between that time and December, No. 1 Manitoba was consistently quoted at Winnipeg several cents a bushel above No. 1 Dark Northern at Minneapolis. Similarly, No. 2 Hard Winter at Kansas City was consistently cheaper than Argentine wheat at Buenos Aires.

In December, however, certain new influences came into play. The Argentine cash price declined to within a cent or two of the Kansas City quotation for Hard Winter, and the contract quotation at Buenos Aires, which is probably quite as significant in this connection, fell below the similar Chicago quotation. Late in the month, Rosafé sold as low as Hard Winter in England, despite the fact that it is esteemed a superior wheat. The spread between Minneapolis and Winnipeg prices also became

[1] By reference to the chart on p. 105 it will be seen that after July 4 the American quotation for future delivery was lower than the Argentine or Canadian.

somewhat narrower than in preceding months. The relatively low level of our prices for winter wheat during this period is explicable on the basis of quantity available,[1] but the difference in favor of Canadian spring wheat as compared with ours is more difficult to explain.

In view of the relative scarcity of the best grade of spring wheat, it is entirely natural that it should bring a higher price than other more abundant or less desirable grades. The extent of the Canadian premium, however, can only be explained by speculative operation and intrinsically higher quality. In October Winnipeg quotations were sometimes higher than the Liverpool figure for Manitoba, owing largely to the wide spread between No. 1 and No. 3, the latter being accepted on the Liverpool contract.

Table 23 summarizes the difference between the Kansas City and Buenos Aires average cash quotations and between the Minneapolis and Winnipeg average cash quotations in each of the past six months.

Comparable price relationships have existed in the Liverpool market, where late in the autumn, when Canadian wheat was available in large quantities. These relationships are graphically presented in Chart 2, showing the price of Duluth No. 1 Northern in comparison with that of No. 1 Manitoba, and No. 2 Hard Winter in comparison with Rosafé, all at Liverpool.

TABLE 23.—AVERAGE MONTHLY PREMIUM OF ARGENTINE AND CANADIAN CASH WHEAT OVER AMERICAN, JUNE TO DECEMBER, 1924*

(Dollars per bushel)

Month 1924	Argentine over American Winter	Canadian over American Spring
June	$ .04	($ .24) [a]
July	.10	(.11) [a]
August	.23	.02
September	.23	.08
October	.22	.06
November	.17	.10
December	.02 [b]	.02

*Quotations: Argentine, Tuesday average for Barletta at Buenos Aires; Canadian, Friday average for No. 1 at Manitoba; American Winter, average of daily quotations for No. 2 Hard at Kansas City; American Spring, similar average for No. 1 Dark Northern at Minneapolis.

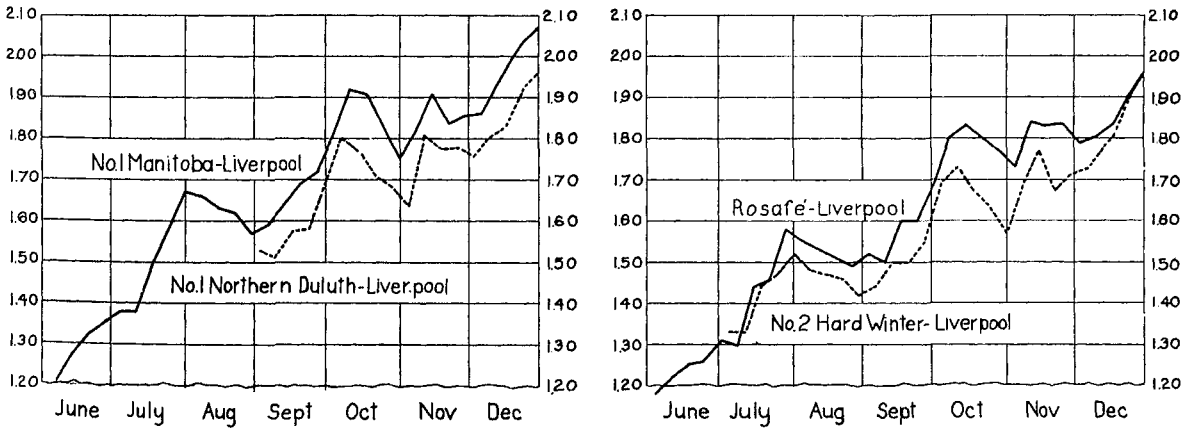
[a] Premium in favor of Minneapolis.

[b] Average difference in first two weeks in December.

In comparing the levels of the different imported wheats in Liverpool during the autumn, it is clear that little importing was being done from the exporting countries whose wheats were quoted at the highest figure. The wheats were drawn instead from the countries whose wheats were American wheat (except Pacific) has consistently sold at lower prices than wheat from other countries. This was true even

CHART 2.—COMPARISON OF CANADIAN AND ARGENTINE CASH PRICES OF WHEAT WITH AMERICAN, WEEKLY, JUNE–DECEMBER, 1924*

(U. S. dollars per bushel)



* Sources: Broomhall's *Corn Trade News* and *International Crop Report and Agricultural Statistics.*

[1] See WHEAT STUDIES, No. 1, pp. 42, 47, for discussion of usual relation of quantity marketed to price.

quoted lowest; for example, at one time Buenos Aires was 10 cents above New York, but New York was doing the exporting instead of Buenos Aires.

During the active period of American exporting in the fall, when the flow of Canadian wheat was delayed and Argentine exports represented the old crop, the c. i. f. prices of American wheat were lower than the corresponding prices of Canadian and Argentine wheats, though these continued to be exported. With the decline in the movement of American wheat in December, the increasing volume of Canadian export, and the approach of the movement of the new Argentine crop, the c. i. f. price of American wheat rose relative to the others and the three wheats reached parity in December for grades equal in British milling value, with occasional days when American wheat was higher than that of Canada and Argentina. One expects the c. i. f. price of North American wheat to shade that of the wheat of the Southern Hemisphere during the autumnal months, when the flow of export wheat of the Northern Hemisphere is heavy and that of the Southern Hemisphere light, the position to be reversed after the first of the year when the export movement from Argentina and Australia becomes heavy.

Variable Increases on the Continent

On the continent of Europe, prices of import wheats have advanced roughly *pari passu* with prices in the Liverpool market, if exchange rates are taken into account, subject to variations caused by overbuying and reselling of cargoes. Prices of domestic wheat, however, have varied not a little from prices of import wheat. Appendix Table VI indicates roughly the monthly movements in European domestic wheat prices, but more detailed figures alone bring out the peculiarities of the advance.

In France, for example, domestic wheat was relatively higher than import wheat in April, May, and June; but in succeeding months it rose less rapidly than foreign wheat, and since July has been consistently lower than most grades of import wheat. Late in May, domestic wheat was selling, f. o. b. provincial stations, around 95 francs a quintal, several francs above even the best grades of import wheats c. i. f. French ports. In the last week in November, with not very different values of the franc, domestic wheat was selling similarly around 120 francs a quintal, while import wheats commanded several francs premium.[1] Domestic wheat had therefore risen by about 26 per cent, while import wheat had risen about 44 per cent.[2] This variation is attributable partly to the relative exhaustion of domestic wheats late in the previous crop year, when import wheats were abundant, and partly to the fact that the new crop was fully available in November,—in short, to seasonal factors intensified by the small French crop of 1923 and the larger crop of 1924; but in part it must be attributed to the low quality of French wheat this year.[3]

The French market, and particularly the mills, have been much disturbed by changes in and uncertainties regarding government policies. The Paris *Bourse de Commerce* was closed from February 18 to August 4, and reopened under new regulations. The duty on wheat was re-established at 14 francs per quintal August 1, but in December a law was passed authorizing refunds of duties paid on foreign wheat used in flour for domestic purposes, and the turnover tax on breadstuffs was abolished. The government has attempted to fix not only rates of extraction, but flour prices as well. The government gave up the attempt to impose the extraction regulation on imported flour. Bread prices remain subject to local regulation, and are kept low in relation to flour and wheat prices. Reduced consumption is sought through restricting bakery hours. Latterly the War Ministry was voted 150 million francs for creating a breadstuffs reserve. These and other measures have aroused great opposition, and may yet be modified, in practice if not in law.

[1] Quotations in *La Meunerie Française.*

[2] The margin increased slightly in December, judging by the January *Bulletin d'Information* of the Association Générale des Producteurs du Blé.

[3] Similar reasons account for the relatively low Gazette price of British wheat, which sold in December at considerable discount under import prices, and rose much less between May and December.

German prices of bread grains and flour have fluctuated greatly throughout 1924. Table 24 shows successive high points and low points in weekly quotations on the Berlin market. In April, May, and June, prices sank, owing to low domestic consumption in the face of considerable stocks of domestic and imported grain and flour. During the summer, with poor prospects for domestic crops and with rising world prices, a tremendous rise took place, much greater in rye than in wheat. From the low point of June 24 to the high point of October 7, wheat prices increased 80 per cent, and rye prices 110 per cent. This was followed by a decline in October as prospects of tariff duties weakened, as threshing improved the outlook for domestic supplies, and as heavy reselling of import grain and flour took place. In November and December the market recovered. On the whole, throughout this period, German prices of bread grains and flour have been relatively low, in terms of dollars, and have risen less above the 1913 average than prices in foreign markets have risen, or than c. i. f. prices of imports.[1]

In Germany also, uncertainties regarding government policies have affected the market. In July the permission to export helped prices to recover, and the renewed prohibition of export on October 1 may have had some adverse influence. Fear of the imposition of import duties on grain and flour, proposed by the government in July, led to speculative buying, heavy imports, and higher prices in succeeding months. By October, when high prices had weakened the agitation for protective duties, the market was so overstocked that local banks were unable to finance millers, causing reduced demand and heavy resales by importers at a loss. Future trading, prohibited since July 1914, was permitted from December 1, 1924. Restrictions on bread prices and loaf weights were abolished early in November, and resulting price increases bid fair to restrict consumption and lessen demand for wheat.

In Italy, seasonal factors operated to cause a fall in domestic wheat prices in June and July,[2] but they have since risen sharply, as the shortage of the domestic crop was felt. An especially sharp rise in October was attributed to the apparently unexpected failure of Russia to deliver on grain contracts. On the whole, domestic wheats have risen as much as import wheats. Between June and December, the net increase was something like 45 per cent, and December prices were some 75 per cent higher than in December.[3]

TABLE 24.—BERLIN WHOLESALE PRICES OF WHEAT, RYE, AND FLOUR AT SELECTED DATES, 1924*

(Marks per quintal)

Date	Wheat	Rye	Wheat flour	Rye flour
1913 Average	19.52	16.25	26.90	20.85
1924 Jan. 29	14.85	12.80	23.75	21.29
Apr. 1	17.55	13.95	26.25	22.50
June 24	13.55	11.85	21.50	18.88
Oct. 7	24.50	24.90	35.38	35.38
Nov. 5	19.70	19.65	29.13	29.00

*Source: *Wirtschaft und Statistik.* Comparable later data not yet available.

These discussions are sufficient to indicate that while increases in wheat prices have been general, prices in individual countries have been so greatly influenced by domestic crops, by government policies, and by marked conditions that price movements have been far from uniform both in character and degree. They reveal important limitations upon the concept of a "world price" for wheat.

THE UNCERTAIN PRICE OUTLOOK

In considering the price outlook, it must be assumed that the current price represents a rough consensus as to the figure at which available supplies will meet requirements during the next few months, with unknown factors weighted according to the best information available. It cannot be assumed that this opinion is correct or will prove correct: the factors may change, or they may prove to have been incorrectly gauged. This year errors of judgment and

[1] See Table in *Wirtschaft und Statistik*, Nov. 12, 1924, p. 667. The same situation is shown by German indexes of commodity prices in general.

[2] The extension, July 1, of the suspension of the wheat import duty may also have had some influence.

[3] See Appendix Table VI, continuing Appendix Table XVIII, in WHEAT STUDIES, No. 1.

real changes in the situation, unless they offset one another, seem likely to influence prices in unusual degree, because of the close adjustment between supplies and requirements.

In the American speculative market there have been some decided differences of opinion, the Grain Marketing Company avowedly anticipating declining world prices with the marketing of crops of the Southern Hemisphere, and other groups as emphatically expecting a further pronounced rise culminating perhaps in May. Apparently the autumnal policy of the Canadian wheat pool was to hold for better prices. European importing interests are clearly nervous about the outlook, hoping without confidence that factors may develop to check or reverse the upward trend. There is abundant reason for uncertainty, and considerable fluctuations in prices may be expected, regardless of the trend over the period.

So far as the next few months are concerned, it must be noted that the seasonal tendency is upward. The average rise from December to May is something like 7 per cent in the United States and 3 per cent in Liverpool. In years of shortage of supplies, the seasonal tendency has frequently been intensified: witness the spring of 1898 and that of 1909. This has occurred even when the subsequent crops have been of good size, and when June and July prices receded sharply from the May levels. On the other hand, the price increase that has already occurred is much larger than has heretofore preceded pronounced upward movements between December and May.

With reference to future price developments in the world market, the measurement of world supplies is evidently clearer than the measurement of European effective demand. If Europe, during the spring, finds that it has been unable to make effective substitutions for the short bread-grain crop, a distressed import program might develop comparable to that of last September, when the acute stringency in the European supplies was first realized. A difference of 20 to 30 million bushels, in itself a relatively small part of Europe's annual requirements, added to or subtracted from the expected imports between April 1 and August 1, might exert a notable price influence upwards or downwards.

The experience of 1923–24 affords recent evidence of the fact that American prices are not invariably determined by the international price.[1] It is conceivable, as some observers believe, that American grain has been "overmarketed," and exported so heavily that domestic requirements in coming months will force prices here above the export level, as they were for spring wheat in much of 1923–24. American exports to January 1 were heavy enough to lend support to this theory.

The possibility of such a rise here is associated with scarcity of desired milling wheats after heavy exports have reduced the country practically to the domestic basis. It seems probable that April will find us reduced practically to the domestic basis, except for flour and for incidental grain exports. Cash premiums on desired milling grades of both hard and soft wheats indicate conditions of scarcity confronting buyers for the large mills. Up to January 1, Canada exported nearly 100 million bushels, mostly No. 3 and lower grades, leaving her probably 76 million bushels, containing much of the best wheat of the crop. Faced with consumers' demands for flour having little reference to price, American mills may have to import Canadian wheat duty-paid, comb the country for odd lots of good domestic wheat, or modify the blending formulas of trade-mark brands of flour. Under such circumstances, import of wheat into this country in the spring is possible, independent of the position of the foreign price except as the basis for the Canadian price plus duty, with transportation equalized.[1] Under present conditions severe milling competition is natural, irrespective of the export situation; but this may be intensified as the result of our heavy exports, which may restrict the buying facilities of the mills.

[1] See WHEAT STUDIES, No. 1, pp. 27, 28, 42.

[2] It is pertinent to remark that the tariff was raised from 30 to 40 cents a bushel on evidence of relative costs of production in 1923, when Canadian costs were exceptionally low. Relative costs of production for the 1924 crops justify no such rates of duty during the present crop year.

Our visible wheat supply is large, but the wheat behind visible positions is not large, if official reports of the size of the crop are to be trusted. American mills now do a great deal of buying in the country, and when these supplies fail, only the grain in terminal market remains. If the time should come when we are literally on a domestic basis and all salable supplies are in terminal markets, prices could hardly fail to rise above the world level.

In June and July, 1925, the price of wheat, and exports and imports during those months, will depend greatly upon the outlook for new crops. If good crops in the United States and Canada are in prospect, reserves may be safely allowed to fall to low levels, whereas if small or late crops are in prospect, the reserves will be maintained at a higher level even though prices are high. If Europe's crops promise well, importers' requirements will slacken and European reserves will be allowed to fall: whereas if crops promise to be poor, late, or both, imports will be normally heavier.

While it is much too early to speak confidently about the situation next June, it is clear that the higher prices of the present year have favored increased plantings of winter wheat. Furthermore, there is every reason to expect that prices in the spring will be sufficiently above the levels of recent springs to stimulate large plantings of spring wheat, also corresponding increases in the Southern Hemisphere. Average yields from enlarged acreage would produce a crop distinctly higher than that of 1924, though probably smaller than that of 1923. Allowing for an upward trend in wheat consumption, a world crop of 3,300 million bushels, excluding Russia, may well constitute a normal crop in 1925.

In any event, the present indications are that, with increased acreage and potentially average yields per acre next summer, the acute stringency in the wheat market will be relieved when the new crops are harvested, and that prices next year will be lower than the present level. The market's judgment on this point is reflected in the wide spread, in December, between May and July futures, as shown in Table 25. But it is much too early to appraise with confidence the outlook for next year's acreage, crop, or prices.

TABLE 25.—DISCOUNT OF JULY FUTURES UNDER MAY FUTURES IN DECEMBER QUOTATIONS IN CHICAGO, 1901–13, 1921–24*

Year	Per cent	Year	Per cent	Year	Per cent
1901	0.06	1907	6.0	1913	3.3
1902	3.7	1908	7.0		
1903	6.0	1909	8.7	1921	9.0
1904	11.3	1910	2.9	1922	7.7
1905	5.0	1912	3.2	1924	12.9
1906	0.9	1912	3.2	1924	12.9

* Source: *Daily Trade Bulletin*, Chicago, weekly averages, here averaged for the month.

There is no present prospect that next year's prices will fall to the low level of 1923–24. Even if the crop outlook proves favorable, carryovers will probably be very small. The chances are against the early repetition of such high yields per acre in 1925 as occurred in 1923. The trend of wheat requirements is clearly upward, and even as large a world crop as that of 1923 would be smaller in relation to requirements. A world price below the present level, but well above the average of 1923–24, is the present prospect for the year 1925–26.[1]

THE INFLUENCE OF SPECULATION

While the conditions here discussed thoroughly warrant a high level of wheat prices for the rest of the crop year, no one can say confidently what particular price level is warranted by the whole situation. The question turns chiefly upon the degree of intensity of Europe's demand,—upon what price will be necessary to restrict European imports to the limits imposed by availability of supplies. So far as the United States is concerned, there is the additional question how far, if at all, we have overmarketed, and may be pinched for domestic supplies in the later months of the crop year. No basis exists for determining these facts in advance of experience.

[1] If the present upward movement of the general price level should continue, and establish a level for 1925–26 distinctly higher than for 1923–24, the price of wheat may be expected to be affected by the monetary factors influencing the general price level as well as by the supply and demand factors peculiar to wheat.

Accordingly, the situation furnishes an attractive field for speculative activity, which has increased tremendously in recent months. In such periods as the present, the movement of market prices is therefore greatly influenced by purely speculative purchases and sales.

Grain exchange traders belong to four classes:

(1) Millers, merchants, and exporters who are hedging their business transactions,—selling future contracts as they buy for cash, and subsequently buying futures as they sell their grain or flour.

(2) Professional speculators who deal exclusively, or principally, in grain futures, who study supply and demand carefully and have a background of experience.

(3) Professional speculators who operate on grain exchanges only at intervals, dealing in sugar, cotton, lard, industrial stocks, wheat, and other cereals, passing from one exchange to the other to take advantage of unusual opportunities. These men have the psychology of the trading pit, but usually lack the technical knowledge of class (2), though having access to it.

(4) Amateur speculators, who appear on the grain exchanges only under unusual or abnormal circumstances. These have little knowledge of conditions. They are greatly influenced by the press, attempt to judge a movement by the behavior of professional speculators, and try to get on board with them.

Hedging operations have little influence on the trend of prices, except on a narrow market. Professional speculators base their operations on existing market conditions as they evaluate them. They do not create, but take advantage of the basal market conditions. Such speculation may influence price movements growing out of basal conditions of supply and demand. Since large operations occur mostly on a rising market, the effect of heavy professional trading is often to intensify a tendency,—to make the price rise somewhat faster or to drive it somewhat higher.

The influence of amateur trading is usually in the direction of price increase, since amateur speculators nearly always buy for a rise and rarely sell for a fall. Several times in recent months there have been indications, on the Chicago and Winnipeg exchanges, that amateur speculators, so to speak, took the market out of the hands of the professional dealers and drove prices up.

Price increases which take place under the influence of amateur and in-and-out professional speculators are frequently short-lived. Hence marked fluctuations in prices, with high profits and losses for individual speculators, usually accompany their presence in the wheat market. At such times prices are frequently above and again below the positions justified by underlying conditions of demand and supply. The markets this season afford ample illustration of these facts.

VI. CONCLUDING OBSERVATIONS

The main points of the foregoing discussion may now be briefly summarized.

(1) The world wheat crop (ex-Russia) available for the current crop year is a little over 3,100 million bushels, only slightly less than the crops for 1921 and 1922, but some 380 million bushels short of the 1923 crop. It is 400 million bushels below last year's crop plus Russia's net exports, of which none are expected this year. The wheat crop is of lower average quality than usual, so that a larger proportion, particularly in Europe, is unmillable or will yield less than the normal amount of flour per bushel. The world crop of rye, the other principal bread grain, is relatively shorter than the wheat crop.

(2) Crops of coarse grains are also below normal, as a whole, but crops of oil seeds are good. The rice and potato crops are of fair size, though European potato crops are generally of mediocre quality. Notable substitutions of potatoes for bread grains, and of oil seeds for feed grains, are taking place in Europe. Wheat substitutes, however, are not sufficiently abundant to offset the shortage of wheat and rye.

(3) The moderate improvement in Eu-

rope's financial position and economic outlook increases her ability to purchase import grain, but prevailing high prices are stimulating efforts to keep imports as low as possible. Europe's requirements for wheat imports, however, seem unlikely to be much less than 630 million bushels, which would give her a per capita breadgrain supply well below the post-war average. The wheat requirements of ex-European countries, which are much more responsive to price, may be expected not to exceed 80 or 90 million bushels,—far below last year's record imports and somewhat below common figures of other years. World import requirements are therefore likely to be around 710 million bushels, and will probably be higher rather than lower.

(4) The world exportable surplus of wheat for the year, allowing for reduced carryovers and smaller feeding use, is apparently not over 725 million bushels, and actual exports seem likely to approach this figure. Nearly 50 per cent of the estimated exports for the year had been shipped out by January 1, reflecting an unusually rapid rate of export. This is attributable partly to the fact that the largest surplus existed in the United States, where the harvest is earlier than in other large export areas, and partly to rapid marketing here. There is, therefore, only a narrow margin between maximum probable exports and minimum probable imports, even though Europe is taking large quantities of low grades of Canadian wheat.

(5) Wheat prices rose by upward of 50 per cent between May and December, in response to increasing recognition of the close adjustment between supplies and requirements. Because of this close adjustment and the high price level, prices are especially sensitive to changes of small dimensions in estimates of crops, importers' requirements, feed uses, and the like, and to temporary variations in importers' demands. In European countries, prices of domestic wheats have varied considerably from wheat prices in leading markets, owing chiefly to considerations of quality and to changes or prospective changes in government regulations.

(6) Though there are many uncertainties in the outlook, it is reasonable to expect that next year's crop will be larger than this year's, and that the acute stringency will be relieved by the next harvests. On the basis of present expectations, wheat prices in 1925–26 will be below the level now prevailing, but they are quite unlikely to fall to anything like the abnormally low level characteristic of 1923–24. Prices in June and July 1925 will be materially influenced by prospects for the 1925 crops.

The Outlook for 1925 Crops

Though no accurate forecast of the 1925 crops is possible for several months, a few words concerning the outlook are justified.

In the United States, winter wheat seedings are reported at 42.3 million acres, as compared with a revised figure of 39.7 million acres last year, an increase of 2½ millions, but a lower planted acreage than in any other post-war year except last year.

On the average some 11 per cent of the acreage planted is abandoned, but the percentage varies greatly from year to year. This year the condition was reported December 1 as 81 per cent of normal, considerably below the average figure of 88 plus, but higher than for the 1922 and 1923 crops, which suffered excessive abandonment. Though the December condition figure is by no means an index of spring abandonment, which is also greatly affected by winter developments and spring prices, low December condition figures tend to be followed by abandonment above average. Even the average percentage abandonment, however, would reduce next year's harvest area of winter wheat to 37.2 million acres, less than a million acres above last year's harvested area.

Since last year's yields per acre harvested were exceptionally good, there is no present reason to expect next year's winter wheat harvest to exceed last year's, if indeed it be as large. On the basis of 15 bushels to the acre, a harvested acreage of 37.2 million acres would give 538 million bushels, about 50 millions short of the 1924 crop.

For Europe, data on fall sowings are still too scanty to have much significance, but no pronounced change in acreage is indi-

cated by available information. In British India a 5 per cent increase is reported.

Marked increases in acreage, if they take place at all, must take place in spring wheat areas, notably in Canada and our own Northwest, or in the Southern Hemisphere. In view of prices and the price outlook, such an increase can be expected if the weather is ordinarily favorable for seeding.

The yield per acre will be the dominant factor in next year's crops, as always, and as to this no safe basis for forecast exists.

Consequences to Producers and Consumers

American wheat farmers have profited largely, this year, from a favorable combination of circumstances,—high yields per acre (produced therefore at low costs per bushel), of good quality wheat, salable at high prices because of crop shortages elsewhere. The great bulk of the crop was marketed by December 31, at distinctly profitable prices, though at an average price much below those now prevailing.

The result is a marked improvement in the wheat farmer's financial position and credit, shown in reduced indebtedness and increased purchasing power. In the outlook for next year, there is nothing to threaten a return of the depressing conditions of the past three seasons. The wheat farmer's emergency is ended. In a larger view, however, it must be emphasized that the process of agricultural readjustment, in the world at large, is by no means complete. Neither last year nor this year can be regarded as typical wheat years, in the United States or the rest of the world. In high production-cost areas particularly, continued readjustment must be undertaken.

In Canada, the increase in prices has been even greater than in the United States and, because of the later marketing, Canadian farmers have profited more largely from the rising prices. The average farm price per bushel in Canada is estimated at $1.20, as compared with 67 cents last year and 60–62 cents in 1912 and 1913. Canada's smaller crop has therefore brought the growers a slightly larger sum than last year's bumper yield, and probably a net profit instead of a small net loss.

In certain European countries the same is true. In others, however, decreases in quantity, quality, or both have apparently made the situation less favorable for grain growers than in the low-price year, 1923–24. High prices of wheat have temporarily checkmated agrarian agitation for higher tariffs on wheat and flour, and have led to reductions or suspensions of existing duties.

The full effect of the increase in wheat prices has not yet been felt by consumers, for bread prices are under control in several countries, and in general tend to lag more or less behind rising prices of wheat. Further advances seem inevitable, for bread of equivalent quality. Already the changes have led to numerous governmental investigations and to efforts to reduce the quality of bread. European bread is poorer as well as dearer than in recent years.

The root cause of the present situation, as impartial investigation shows, is the temporary ill-adjustment between wheat supplies and requirements. The same was true last year, when the other shoe pinched, —the consumer benefiting at the expense of the farmer. The basic difficulties are not properly chargeable to popular bogies such as the speculator or the middleman. Nor can they be prevented by legislative acts, administrative measures, or new forms of business procedure, though emergencies usually call attention to persisting opportunities for desirable improvements in many directions. In time such maladjustments tend to bring their own remedies, but the weather exerts an influence upon agricultural conditions from year to year far outweighing human decisions. Such a pronounced change as occurred this year is exceedingly rare.

Exceptional conditions such as those of 1923–24 and 1924–25 properly call for efforts to palliate the difficulties experienced by farmers or consumers, and there is ample room for considering whether abnormalities and instability in wheat prices cannot be reduced. But it is important that proposed measures be considered in the light of the underlying conditions, or they may prove ineffective or actually injurious to the community at large.

APPENDIX

TABLE I.—PRODUCTION OF LEADING CEREALS (EXCEPT WHEAT) AND POTATOES IN PRINCIPAL PRODUCING AREAS, PRE-WAR AND POST-WAR*

(A) RYE *(million bushels)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
Northern Hemisphere[b]	1,014	[c]	603	840	848	913	740
United States	36	76	61	62	103	63	64
Europe (ex-Russia)	976	[c]	532	757	713	827	663
France	53 [d]	31	34	44	38	37	40
Spain	28	23	28	28	26	28	30
Germany	368 [d]	240	194	268	206	263	226
Czecho-Slovakia	64 [d]	33	33	54	51	53	46
Hungary	31 [d]	[c]	21	23	25	31	23
Poland	219 [d]	[c]	74	168	197	235	151

(B) CORN *(million bushels)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
World	3,904	3,962	4,437	4,076	3,972	4,300	[c]
United States	2,712	2,811	3,209	3,069	2,906	3,054	2,437
Italy	103 [d]	86	89	92	77	89	98
Hungary	61 [d]	[c]	50	32	49	49	80
Jugo-Slavia	112 [d]	[c]	101	74	89	81	106
Bulgaria	26 [d]	[c]	21	16	16	27	27
Roumania	193 [d]	141	182	111	111	151	157
Argentina	192	224	259	230	176	277	[c]

(C) OATS *(million bushels)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
World (ex-Russia)	3,551	[c]	3,606	3,111	3,375	3,854	[c]
Northern Hemisphere (ex-Russia)	3,447	[c]	3,517	3,046	3,285	3,742	3,640
United States	1,143	1,184	1,496	1,078	1,216	1,306	1,542
Canada	352	394	531	426	291	564	412
Europe (ex-Russia)	1,927	[c]	1,478	1,509	1,551	1,834	1,658
United Kingdom	207	249	220	201	199	194	207
France	368 [d]	180 [e]	291	244	288	337	296
Germany	527 [d]	310 [e]	332	345	277	421	390
Poland	196 [d]	[c]	129	150	176	243	177
Argentina	54	57	48	31	56	81	51
Australia	18	16	23	15	19	18	[c]

(D) BARLEY *(million bushels)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
World (ex-Russia)	1,315	[c]	1,157	1,149	1,203	1,331	[c]
Northern Hemisphere (ex-Russia)	1,301	[c]	1,138	1,130	1,178	1,299	1,200
United States	185	148	189	155	182	198	188
Canada	45	56	63	60	72	77	91
Europe (ex-Russia)	701	[c]	551	566	603	671	582
United Kingdom	65	60	68	56	56	53	59
Spain	75	82	90	89	78	112	60
Germany	134 [d]	88 [e]	82	89	74	108	110
Poland	69 [d]	[c]	39	56	60	76	57
North Africa	98	70	57	109	57	106	84
India	145	130	150	117	146	145	145
Japanese Empire	124	128	124	121	116	100	111

* For sources and notes, see next page.

TABLE I.—PRODUCTION OF LEADING CEREALS (EXCEPT WHEAT) AND POTATOES IN PRINCIPAL PRODUCING AREAS, PRE-WAR AND POST-WAR* *(Concluded)*

(*E*) RICE *(thousand short tons of cleaned rice)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
World [h]	55,300	64,000	59,000	64,000	66,500	60,000	[c]
United States	330	583	723	522	575	468	472
Spain	150	206	197	178	187	165	150
Italy	323	331	307	321	316	354	374
India	32,072	35,821	30,981	37,139	37,762	31,694	[c]
Japan	7,894	9,553	9,925	8,668	9,533	8,713	9,132
Formosa	706	773	761	782	855	764	750
French Indo-China	3,666	3,266	3,142	3,966	3,947	3,606	3,850
Siam	2,724	3,430	3,329	2,903	2,977	3,013	[c]
Ceylon	238	244	240	247	261	148	173
Philippine Islands	583	1,044	1,124	1,282	1,340	1,351	1,342
Java and Madura	3,590	4,899	4,174	3,680	4,494	4,764	5,200

(*F*) POTATOES *(million bushels)*

Area	Average 1909–13	1919	1920	1921	1922	1923	1924 [a]
United States	358	323	403	362	453	416	455
Canada	78	126	134	107	93	92	97
England and Wales	100	102	119	110	150	103	99
Netherlands	104	127	122	107	162	90	99
Belgium	108	104	83	72	145	104	87
France	489 [e]	313	428	305	465	364	559
Spain	113 [f]	101	108	102	109	95	89
Germany	1,374 [d]	761	1,024	961	1,494	1,197	1,338
Czecho-Slovakia	[c]	84	184	159	333	229	228
Poland	449 [g]	386	665	617	1,240	974	1,004

* Sources: U. S. Dept. of Agric., *Yearbooks*, chiefly 1923; and *Foreign Crops and Markets*. Data derived largely from official estimates reported to International Institute of Agriculture, supplemented or modified in certain instances by Department of Agriculture estimates or adjustments.

a Data for 1924 are preliminary, hence especially subject to change.

b This total includes every country in the Northern Hemisphere whose production is of any size, except Russia, for which the pre-war estimated output for present territory is 776,198,000 bushels. The Southern Hemisphere production is of minor importance, the pre-war average being about 2½ million bushels and 1923–24 probably less than 5 million bushels.

c Data lacking or incomplete. *d* U. S. Dept. of Agric. estimate for present territory. *e* Pre-war boundaries.

f Two-year average. *g* Preliminary estimate for former Russian territory within 1923 boundaries.

h Exclusive of China, where a normal crop is around 30 million short tons. A prominent Chinese authority has estimated the 1923 crop at 25 million tons.

TABLE II.—APPARENT DOMESTIC UTILIZATION OF WHEAT (DISREGARDING CARRYOVERS) IN VARIOUS COUNTRIES, PRE-WAR AND POST-WAR*

(Million bushels)

(*A*) PRINCIPAL EXPORTING COUNTRIES

Year ending July 31	United States	Canada	Argentina	Australia	British India	Roumania	Hungary	Bulgaria	Jugo-Slavia	Algeria and Tunis	Morocco [a]
1909–14 ave.	579.9	101.1	62.4	22.3	302.0	[b]	[b]	[b]	[b]	36.9	16.7
1920–21	514.6	95.3	92.5	57.0	362.8	59.9	38.3	28.2	39.2	20.6	17.9
1921–22	563.7	114.2	72.9	14.5	264.2	75.1	43.3	24.7	47.9	40.0	22.5
1922–23	668.0	118.8	56.4	59.0	338.4	90.4	49.5	[d]	43.5	17.6	14.0
1923–24	670.6	126.0	74.8	39.9	349.1	99.8	50.9	[d]	55.8	36.0	19.8
1920–24 ave.	604.2	113.6	74.2	42.6	328.6	81.3	45.5	—	46.6	28.6	18.5

* Sources: Production figures, U. S. Dept. of Agric. *Foreign Crops and Markets;* trade figures, *International Yearbook of Agricultural Statistics* and *International Crop Report.*

a Net imports estimated. *b* Trade figures comparable with post-war years not available.

d Trade figures not available.

TABLE II.—APPARENT DOMESTIC UTILIZATION OF WHEAT (DISREGARDING CARRYOVERS) IN VARIOUS COUNTRIES, PRE-WAR AND POST-WAR* *(Concluded)*

(Million bushels)

(B) PRINCIPAL IMPORTING COUNTRIES

Year ending July 31	United Kingdom	France	Germany	Italy	Belgium	Netherlands	Switzerland	Spain	Portugal [a]	Denmark
1909–14 ave.	277.3	361.2 [c]	219.9 [c]	236.3 [c]	65.4	27.5	20.2	136.6	12.0	11.8 [c]
1920–21	256.9	305.2	142.4 [e]	240.7	42.5	24.9	16.5	158.4	10.4	7.8
1921–22	282.0	340.6	177.3 [e]	294.6	55.0	28.4	16.8	153.2	9.5	15.2
1922–23	277.1	288.9	109.4 [e]	277.3	50.1	30.1	18.9	125.3	9.8	15.5
1923–24	295.2	328.6	137.3 [e]	294.6	53.7	32.9	20.7	[d]	13.0	18.0
1920–24 ave.	277.8	315.8	141.6 [e]	276.8	50.3	29.1	18.2	145.6 [f]	10.7	14.1

Year ending July 31	Sweden	Norway	Austria	Czecho-Slovakia	Poland	Latvia, Esthonia, [a] and Lithuania	Finland	Greece	Egypt	Japan
1909–14 ave.	15.2	4.1	71.6 [c]	[b]	[b]	[b]	[b]	[b]	33.7	29.2
1920–21	16.9	4.8	20.0	44.7	[d]	4.6	2.7	21.8	42.9	36.0
1921–22	16.2	6.1	25.5	50.3	38.6	6.1	3.8	24.9	43.8	53.5
1922–23	18.2	7.5	20.8	43.9	45.0	8.0	5.8	26.9	44.3	42.1
1923–24	24.0	6.7	27.1	57.4	50.7	8.9	5.6	32.2	49.2	108.7
1920–24 ave.	18.8	6.3	23.4	49.1	44.8 [g]	6.9	4.5	26.4	45.0	60.1

* Sources: Production figures, U. S. Dept. of Agric. *Foreign Crops and Markets;* trade figures, *International Yearbook of Agricultural Statistics* and *International Crop Report.*

a Net imports estimated. *b* Trade figures comparable with post-war years not available.

c Pre-war boundaries. *d* Trade figures not available.

e These figures are too low, as the official crop figures for post-war years are known to be underestimated and net imports are incomplete because of territories occupied by foreign armies.

f 1920–23 average. *g* 1921–24 average.

TABLE III.—BROOMHALL'S ESTIMATES OF VISIBLE WHEAT SUPPLIES ON DECEMBER 1, 1919–24, COMPARED WITH PRE-WAR AND POST-WAR AVERAGES*

(Million bushels)

	1919	1920	1921	1922	1923	1924	1910–14 5-yr. ave.	1919–23 5-yr. ave.
United States—wheat								
East of Rockies	136.5	78.1	96.2	112.0	119.9	154.2	95.8	112.7
West of Rockies	5.5	3.6		3.7	8.2	4.5	6.3	
Canada—wheat	41.4	51.2	76.3	89.0	110.2	76.8	34.4	73.6
U. S.—flour as wheat	10.9	10.4	11.7	9.7	11.2	10.0	9.6	10.8
Canada—flour as wheat	.3	.7	.3	.3	.3	.3	.7	.4
Total	194.6	144.0	184.5	214.7	249.8	245.8	146.8	197.5
Argentina	3.3	.2	3.1	3.0	3.0	4.4	0.5	2.5
Australia	79.2 [a]	6.5	6.8	[b]	1.0	[b]	[b]	[b]
Total	82.5 [a]	6.7	9.9	[b]	4.0	[b]	[b]	[b]
United Kingdom—wheat	5.4	28.2	8.1	3.5	6.3	13.0	14.9	10.3
United Kingdom—flour as wheat	5.4	3.4	3.0	1.0	1.4	1.3	3.6	2.8
Afloat for United Kingdom	11.2	6.8	10.3	16.0	15.9	13.6	13.0	12.0
Afloat for Continent	34.9	27.3	20.7	34.6	28.4	28.3	16.1	29.2
Afloat for orders	21.1	2.6	11.5	5.7	7.5	17.3	6.9	9.7
Total	78.0	68.3	53.6	60.8	59.5	73.5	54.5	64.0
Grand total	355.1 [a]	219.0	248.0	[b]	313.3	[b]	[b]	[b]
Excluding Australia	275.9	212.5	241.2	278.5	312.3	323.7	201.8	264.1

* Source: Broomhall's *Corn Trade News.* *a* Exceptional figures due to Australian war stocks. *b* Data incomplete.

TABLE IV.—WHEAT RECEIPTS AT PRIMARY MARKETS IN THE UNITED STATES, AND AT FORT WILLIAM AND PORT ARTHUR, CANADA, WEEKLY, AUGUST TO DECEMBER, 1924*

(Thousand bushels)

Week ending	United States primary markets	Week ending	Fort William and Port Arthur	Week ending	United States primary markets	Week ending	Fort William and Port Arthur
Aug. 2	17,522	Aug. 1	1,920	Oct. 18	20,109	Oct. 17	9,575
Aug. 9	22,861	Aug. 8	1,008	Oct. 25	19,851	Oct. 24	8,926
Aug. 16	22,319	Aug. 15	508	Nov. 1	19,092	Oct. 31	9,731
Aug. 23	21,889	Aug. 22	188	Nov. 8	17,052	Nov. 7	10,762
Aug. 30	20,078	Aug. 29	425	Nov. 15	13,612	Nov. 14	10,237
Sept. 6	19,450	Sept. 5	437	Nov. 22	13,366	Nov. 21	10,270
Sept. 13	20,371	Sept. 12	571	Nov. 29	13,291	Nov. 28	10,695
Sept. 20	18,880	Sept. 19	858	Dec. 6	14,180	Dec. 5	11,291
Sept. 27	17,536	Sept. 26	2,007	Dec. 13	9,227	Dec. 12	7,080
Oct. 4	17,515	Oct. 3	6,618	Dec. 20	6,736	Dec. 19	4,310
Oct. 11	20,475	Oct. 10	11,005	Dec. 27	4,789	Dec. 26	2,306

* Sources: U. S.—*Price Current-Grain Reporter;* Fort William and Port Arthur—*Canadian Grain Statistics.*

TABLE V.—WHEAT RECEIPTS AT PRIMARY MARKETS IN THE UNITED STATES, AND AT FORT WILLIAM AND PORT ARTHUR, CANADA, MONTHLY, CROP YEARS, 1920–25*

(Million bushels)

Month	United States primary markets					Fort William and Port Arthur					Month
	1920–21	1921–22	1922–23	1923–24	1924–25	1920–21	1921–22	1922–23	1923–24	1924–25	
Aug.	39.6	68.6	60.6	65.3	93.0	—	3.2	3.7	2.0	1.3	Aug.
Sept.	42.7	61.4	57.7	45.3	82.1	12.6	27.5	37.0	28.3	7.1	Sept.
Oct.	44.6	41.6	48.3	40.5	88.0	32.0	46.2	65.1	67.0	40.9	Oct.
Nov.	37.2	25.6	42.5	37.2	60.5	33.4	40.8	56.8	72.5	42.7	Nov.
Dec.	31.6	24.0	45.3	28.4	[c]	27.9	23.0	32.0	51.9	20.3	Dec.
Total 5 mos.	195.7	221.2	254.4	216.7	323.6 [a]	105.9 [a]	140.7	194.6	221.7	112.3	Total 5 mos.
Jan.	29.0	17.5	37.6	15.9	—	7.8	7.7	11.6	12.7	—	Jan.
Feb.	21.2	22.7	21.6	19.8	—	4.5	4.2	3.2	3.9	—	Feb.
Mar.	22.6	20.2	21.7	18.0	—	4.4	9.0	6.0	2.5	—	Mar.
April	23.3	15.6	21.9	10.1	—	3.7	6.1	7.6	6.4	—	April
May	27.0	29.1	16.7	15.4	—	4.4	11.7	10.6	15.8	—	May
June	30.2	21.0	18.2	16.4	—	3.6	5.6	6.9	21.2	—	June
July	62.0	39.5	33.8	35.1	—	4.2	5.4	6.0	13.1	—	July
Total 7 mos.	215.3	165.6	171.5	130.7	—	32.6	49.7	51.9	75.6	—	Total 7 mos.
Grand total	411.0	386.8	425.9	347.4	—	138.5 [b]	190.4	246.5	297.3	—	Grand total

* Sources: U. S. Department of Commerce, *Survey of Current Business;* Fort William and Port Arthur, *Canadian Grain Statistics.* *a* Four months. *b* Eleven months. *c* Not available.

TABLE VI.—AVERAGE PRICES OF DOMESTIC WHEATS IN EUROPEAN MARKETS, MONTHLY, 1923–24*

Month	Great Britain	France (Chartres)	Italy (Milan)	Germany (Berlin)	Great Britain	France (Chartres)	Italy (Milan)	Germany (Berlin)	Month
	s. d. per quarter	*francs per quintal*	*lire per quintal*	*gold mks per quintal*	*U. S. dollars per bushel* [a]				
1924 Apr.	45–3	92.25	112.88	17.36	1.23	1.55	1.36	1.12	Apr. 1924
May	46–11	92.50	112.90	16.20	1.28	1.46	1.36	1.05	May
June	48–5	97.65	111.62	14.49	1.31	1.40	1.32	.94	June
July	51–11	97.25	106.88	16.51	1.42	1.36	1.25	1.07	July
Aug.	54–9	101.00	116.00	19.88	1.54	1.50	1.40	1.29	Aug.
Sept.	51–10	106.70	125.25	22.51	1.45	1.54	1.49	1.46	Sept.
Oct.	54–0	113.45	149.20	22.65	1.52	1.62	1.77	1.47	Oct.
Nov.	54–3	119.05	155.50	21.19	1.56	1.71	1.83	1.37	Nov.
Dec.	52–6	120.31	162.75 [b]	[c]	1.54	1.77	1.92 [b]	[c]	Dec.

* Sources: Great Britain, London *Economist;* France, U. S. Federal Reserve Board; Italy, *International Crop Report and Agricultural Statistics;* Germany, *Wirtschaft und Statistik.*
a Conversions made at average exchange rates for the month. *b* Average for first 2 weeks of December. *c* Not available.

TABLE VII.—WEEKLY CASH PRICES OF REPRESENTATIVE WHEATS IN LEADING EXPORTING AND IMPORTING MARKETS, JUNE TO DECEMBER, 1924*

(U. S. dollars per bushel)

Month	United States			Canada	Argentina	Liverpool					Month
	No. 2 Red Winter (Chicago)	No. 2 Hard Winter (Kansas City)	No. 1 Dark Northern (Minneapolis)	No. 1 Manitoba (Winnipeg)	Barletta (Buenos Aires)	No. 1 Manitoba	Argentine Rosafe	Australian	Pacific White	No. 2 Winter	
June	[a]	1.03	1.29	1.06	1.03	1.21	1.18	1.28	1.31	[a]	June
	1.09	1.05	1.31	1.09	1.08	1.27	1.22	1.30	1.32	[a]	
	1.17	1.13	1.42	1.16	1.17	1.32	1.25	1.33	1.39	[a]	
	1.15	1.13	1.43	1.18	1.18	1.35	1.26	1.33	1.42	[a]	
July	1.16	1.14	1.45	1.21	1.20	1.38	1.31	1.35	1.45	1.33	July
	1.16	1.10	1.42	1.24	1.21	1.38	1.30	1.37	1.36	1.33	
	1.29	1.18	1.48	1.47	1.32	1.49	1.44	1.47	1.53	1.44	
	1.33	1.21	1.49	1.47	1.34	1.58	1.46	1.52	1.57	1.47	
	—	—	—	—	—	—	1.58	—	—	—	
Aug.	1.34	1.24	1.52	1.49	1.46	1.67	1.55	1.57	1.61	1.52	Aug.
	1.32	1.22	1.50	1.49	1.45	1.66	1.53	1.61	1.63	1.48	
	1.31	1.20	1.42	1.47	1.38	1.63	1.51	1.55	1.59	1.47	
	1.33	1.20	1.40	1.37	1.41	1.62	1.49	1.55	1.58	1.46	
	1.28	1.14	1.35	1.39	1.40	1.57	—	1.53	1.57	1.42	
Sept.	1.29	1.16	1.32	1.36	1.42	1.59	1.52	1.57	1.57	1.44	Sept.
	1.28	1.16	1.32	1.43	1.42	1.64	1.50	1.64	1.61	1.50	
	1.35	1.21	1.37	1.44	1.44	1.69	1.60	1.66	1.64	1.50	
	1.39	1.24	1.39	1.52	1.46	1.72	1.60	1.68	1.68	1.55	
	—	—	—	—	—	—	1.68	—	—	—	
Oct.	1.52	1.34	1.46	1.57	1.57	1.81	1.80	1.74	1.74	1.69	Oct.
	1.56	1.40	1.54	1.62	1.57	1.92	1.83	1.82	[a]	1.73	
	1.56	1.38	1.51	1.66	1.63	1.91	1.80	1.78	1.81	1.67	
	1.53	1.37	1.53	1.55	1.60	1.83	1.77	1.77	1.78	1.63	
	1.49	1.33	1.47	1.51	1.56	1.75	—	1.79	1.74	1.57	
Nov.	1.48	1.33	1.44	1.67	1.59	1.82	1.73	1.79	1.74	1.68	Nov.
	1.51	1.46	1.59	1.67	1.65	1.91	1.84	1.87	[a]	1.77	
	1.59	1.46	1.59	1.64	1.61	1.84	1.83	1.86	1.77	1.67	
	1.66	1.49	1.60	1.65	1.60	1.85	1.84	1.85	1.83	1.71	
Dec.	1.66	1.51	1.62	1.64	1.54	1.86	1.79	1.87	1.83	1.73	Dec.
	1.73	1.57	1.67	1.69	1.59	1.93	1.80	1.89	1.85	1.78	
	1.80	1.64	1.74	1.80	[c]	1.97 [b]	1.83	1.91 [b]	1.88 [b]	1.80 [b]	
	1.86	1.71	1.79	1.86	[c]	2.04 [b]	1.90	1.94 [b]	1.90 [b]	1.90 [b]	
	—	—	—	—	—	2.07 [b]	1.96	1.96 [b]	1.95 [b]	1.96 [b]	

* Sources: U. S. prices from U. S. Dept. of Agriculture, *Crops and Markets;* foreign prices from *International Crop Report and Agricultural Statistics*, except Rosafé, which is from Broomhall's *Corn Trade News*. U. S. prices are weekly averages of daily weighted prices for weeks ending Friday. Foreign prices are for Friday of each week, except Rosafé, which is for Tuesday.

[a] No quotation. [b] Tuesday prices from *Corn Trade News*. [c] Not available.

This issue has been prepared by Joseph S. Davis, Katharine Snodgrass, and Alonzo E. Taylor, with substantial assistance from E. Gail Benjamin.

For information on technical points, the Institute is indebted to various members of the grain trade and milling industry, and for data on the French situation, to M. Michel Augé-Laribé of Paris.

WHEAT STUDIES

OF THE

FOOD RESEARCH INSTITUTE

STANFORD UNIVERSITY, CALIFORNIA

The series is designed to give a sound, impartial review of the world wheat position and outlook, based upon careful analysis of the various elements in the situation, with due recognition of economic conditions in exporting and importing countries. The material is presented in a form easily read and understood, and convenient for reference. Surveys of brief periods will appear at intervals. Intensive studies of particular elements in the wheat situation will be included from time to time. Selected statistical data will be printed in appendices to the various issues.

Numbers will appear monthly. Of Volume I, running from December 1924 to September 1925, the following issues have appeared:

No. 1. *The World Wheat Situation, 1923–24: A Review of the Crop Year.* [Single issue, price $2.00.]

No. 2. *Current Sources Concerning Wheat Supplies, Movements, and Prices: A Select List, with Comments.* [Single issue, price $1.00.]

No. 3. *Developments in the Wheat Situation, August to December, 1924.* [Single issue, price $2.00.]

Subsequent issues will include:

The Dispensability of a Wheat Surplus in the United States
Canada as Wheat Producer and Exporter
The World Wheat Situation, January to March, 1925

WHEAT STUDIES is published by Stanford University, California, for the Food Research Institute, at a subscription price of $10.00 for Volume I, beginning December 1924. A binder for use with current issues will be furnished to each regular subscriber. Single issues are separately priced. Application for entry as second-class matter at the post office at Stanford University, California, pending.

Address:

FOOD RESEARCH INSTITUTE
STANFORD UNIVERSITY P. O., CALIFORNIA

The Food Research Institute was established at Stanford University in 1921, jointly by the University Trustees and the Carnegie Corporation of New York, for research in the production, distribution, and consumption of food.

Directors:

CARL LUCAS ALSBERG JOSEPH STANCLIFFE DAVIS
ALONZO ENGLEBERT TAYLOR

STANFORD UNIVERSITY PRESS