WHEAT STUDIES

of the FOOD RESEARCH INSTITUTE

VOL. XX, NO. 1 (Price $1.00) SEPTEMBER 1943

WHEAT OUTLOOK AND POLICIES

Joseph S. Davis

Impressive gains by the United Nations on the Atlantic, Mediterranean, and Russian war fronts have inaugurated a period of enlarging wheat and flour shipments to Europe and Soviet Russia. Their needs, great though often exaggerated, are less by reason of good grain crops, on expanded acreage, in most of Europe except embattled Russian soil and the Iberian Peninsula.

World wheat supplies for 1943–44 are about equal to the unprecedented total of last year. Overseas exporting countries can readily spare far more than shipping yet permits to move. Flour production, stimulated by orders for armed forces and eventual relief use, is at near-capacity levels in Canada and is expanding in Australia and the United States.

Government measures, old and new, keep forcing wheat prices abnormally higher in the United States, with far-reaching consequences. Canadian wheat prices have been sharply raised, following increased demands for export southward and overseas, and export prices in Argentina and Australia are rising.

In the four chief exporting countries combined, as much wheat may this year be used for nonfood purposes as for food and seed. In the United States, where such diversion is heaviest, wheat imports for feed use seem likely to exceed wheat and flour exports. Shortages of coal and maize are driving Argentina to burn wheat. Re-expansion of wheat acreage in these two countries has begun, and Canada and Australia will follow suit in 1944 if absorption of their surpluses proceeds far enough. Judicious restraints on use of wheat for feed, alcohol, and fuel are needed if ample reserves are to be held for prospective food relief and other purposes.

The crucial problems ahead call for vital policy decisions and farsighted management, national and international.

STANFORD UNIVERSITY, CALIFORNIA

WHEAT STUDIES

OF THE

FOOD RESEARCH INSTITUTE

Entered as second-class matter February 11, 1925, at the Post Office at Palo Alto, Stanford University Branch, California, under the Act of August 24, 1912.

Published six times a year by Stanford University for the Food Research Institute.

WHEAT OUTLOOK AND POLICIES

Joseph S. Davis

The progress of the war in recent months has been entirely to the disadvantage of the Axis powers. With the growing preponderance of Allied air power, destruction by bombing in Nazi-dominated western Europe has been increasingly severe and advances on various fronts have been facilitated. The expected German offensive in Russia started late and quickly failed. In turn, Russian armies have regained huge stretches of important territory, in some sections extending to the Dnieper River. British - American forces overwhelmed Sicily in July–August. Mussolini was ousted on July 25. On September 8 the new Badoglio government's unconditional surrender was announced, and most of the Italian navy soon came safely into United Nations ports. In the ensuing four weeks Sardinia and then Corsica fell to the Allies. Despite Marshal Badoglio's statement to Hitler, destruction in Italy prior to the surrender was moderate rather than devastating, but more is likely to occur before the country is completely liberated from German forces.

The Battle of the Atlantic has gone strongly in favor of the United Nations. In the six months ending with May 1943, enemy submarines were sunk at an increasing rate, and Allied shipping losses were more than offset by new United States construction. In June–September such outstanding gains were achieved through reduced losses and increasing output that the tightness of shipping has been significantly eased. Lend-lease food deliveries in July for shipment to Allied fighting fronts set a new record. Competition of cargoes for shipping space has at times been accompanied by some competition of shipping space for cargoes. Many other symptoms of easier shipping conditions have appeared. These include admitted enlargements of imports of coffee, cocoa, sugar, molasses, tea, and bananas into the United States, and larger shipping arrivals in Argentina. Full freedom of the Mediterranean, and the prospective availability of some Italian merchant vessels, will presumably add substantially to the effectiveness of United Nations shipping. But the possibility of recurrence of heavy losses by enemy action cannot yet be ignored.

Progress has also been made in the Pacific. In the Aleutians, United States forces retook Attu in late May, and with Canadian forces occupied Kiska in mid-August after the Japanese had stolen away. In the Solomon Islands–New Guinea area, the important enemy-held strongholds of Munda, Salamaua, and Lae fell in August and September.

Without venturing to predict the pace of warfare on the various fronts, we have already to reckon with relief and rehabilitation in newly liberated areas, and possibilities of more fairly soon. Shipments for eventual relief disposition under Allied Military Government are under way. The feeding of prisoners of war also adds to tonnage requirements. Heavier demands on shipping will doubtless be made for further invasion activities in Continental Europe, as well as for stepping up offensives in the Pacific theaters.

The factors already mentioned introduce significant alterations in the outlook for disposition of wheat supplies in 1943–44. Meanwhile, important developments have occurred in wheat policies, production, and utilization, especially in the overseas exporting countries. Much in the world wheat picture is inevitably blurred, and no one can safely predict the further changes that will occur in the coming months. Yet the time is ripe for reconsideration of the world wheat outlook in the light of new facts available through September, with special reference to policies some of which are still in the making.

CONTENTS

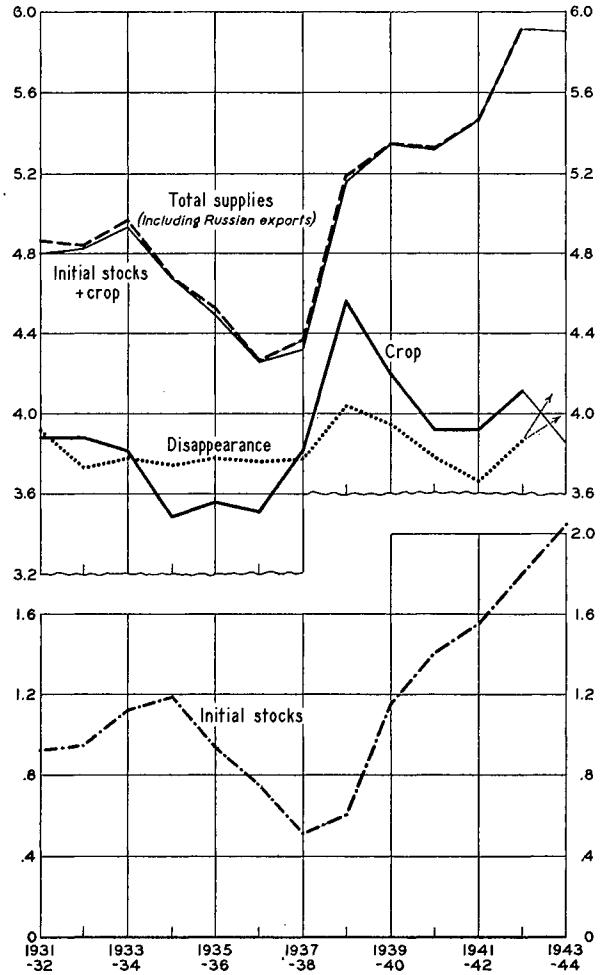
	PAGE
Summary of the Outlook...	2
United States	7
Other Overseas Exporters..	12
Other United Nations.....	16
Continental Europe	19
Nutritional Developments ..	21
Relief and Related Policies.	22
Appendix Tables	30

Summary of the Outlook

Chart 1 epitomizes the supply position in historical perspective. In what we term the world ex-Russia (also excluding China, Iran, and a few small producers), aggregate wheat supplies for 1943–44 will differ little from the unprecedented volume of 1942–43, something like 5.9 billion bushels. As nearly as we can judge now, a net increase in stocks of old wheat will approximately offset a net decrease in 1943 production to a level by no means low. On the whole, this year's yield per acre is well above average on the smallest acreage since the middle 1920's. Disappearance of wheat increased in 1942–43 and will be much larger in 1943–44. By the end of the current crop year, world wheat stocks will surely be reduced from the recent extraordinary peak, but there is no prospect that they will fall as low as the prewar peak.

Chart 1.—Wheat Supplies and Disappearance, World ex-Russia, Annually from 1931–32*

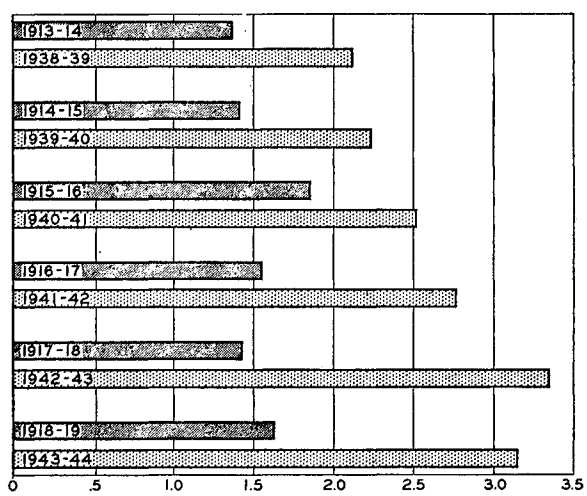
(*Billion bushels*)



* Food Research Institute estimates, utilizing available official data, as in Table II. The stocks series is not quite as comprehensive as the others. The latest figures plotted are preliminary.

Chart 2.—Wheat Supplies in Four Chief Exporting Countries, World Wars I and II*

(*Billion bushels*)



* Food Research Institute estimates, based in large part on official data.

By contrast with 1917–18 and 1918–19, wheat has been and is extremely abundant[1] (see also Chart 2). World wheat stocks as of August 1, 1943 were about 1,500 million bushels above prewar normals. This is nearly equal to Continental Europe's prewar average wheat crop, and more than twice as large as the annual average movement in international trade in the interwar period.

Abundance, however, is relative. If wheat supplies were reserved solely for seed and food use, the priority claimants, there is no doubt that the aggregate would be ample to provide for maximum potential requirements in 1943–44 and leave large carryovers including big reserves against the possible conjuncture of shorter crops and larger food needs in 1944–45. Indeed, there is enough wheat to permit continuation of larger feed and industrial use of wheat than is customary in peacetime, and even some fuel use where

[1] Cf. M. K. Bennett, "Wheat and War, 1914–18 and Now," Wheat Studies, November 1939, XVI, 67–112.

coal is scarce. These nonfood channels, however, are capable of absorbing such huge quantities that unrestrained diversion to them would soon exhaust the surplus. Already important questions of policy concern the degree to which such diversion shall be encouraged or permitted where wheat supplies are heaviest. The crucial problems of the current year are not those of supplies, but of management in the broadest sense of this elastic term.

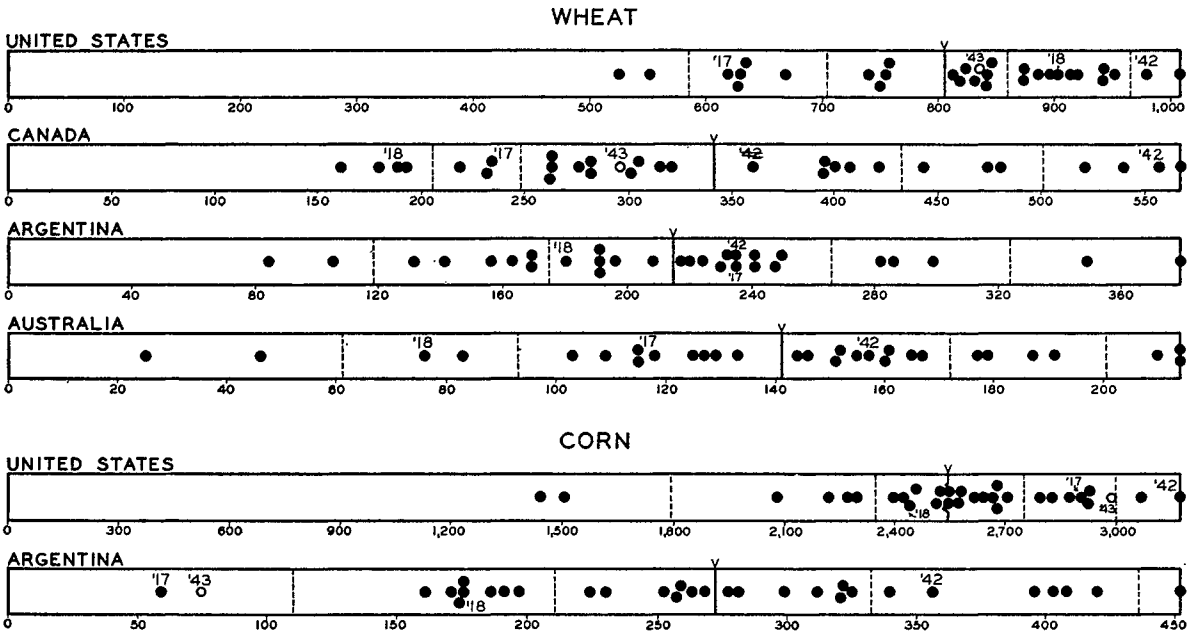
In the four chief exporting countries, stocks of old wheat carried into the new crop year (United States July 1; Canada, Argentina, and Australia August 1) were at the unprecedented level of about 1,700 million bushels. This is larger than the 30-year-average *crop* of 1,500 million in these countries. Only extraordinary diversion to feed use and alcohol manufacture during 1942–43 kept year-end stocks from reaching a still higher peak.

Wheat carryovers plus prospective crops in these four countries add up to total supplies of about 3,130 million bushels. This is only about 220 million short of the record set in 1942–43 and 48 per cent larger than the corresponding total in the last prewar year 1938–39 (Table IV). Before and during World War II, wheat supplies in these four countries have been strikingly larger than in corresponding years of World War I. Chart 2 shows the contrasts graphically.

The 1943 wheat crops in three of these countries were subjected to more or less acreage restriction, and the aggregate may be 500 million bushels less than the near-record outturn of 1942.[2] Chart 3 shows the size distribution of the wheat crops of these four countries, and the corn crops of the United States and Argentina, in the past 30 years. Each series of data was originally plotted with the maximum crop taken as 100, but the inserted scales show absolute figures in million bushels. Latest official estimates of 1943 crops are shown for all but two: we provisionally expect the new Australian wheat crop to be small, and that of Argentina to be close to or somewhat below average size.

CHART 3.—SIZE DISTRIBUTION OF WHEAT AND CORN CROPS IN FOUR CHIEF EXPORTING COUNTRIES, 1913–43*

(Million bushels; each bar represents maximum crop to date)



* Based on latest official estimates. Averages are indicated by solid vertical lines labeled "V." Other lines dividing size groups are arbitrary.

[2] The 1942 total, which we now put at 1,930 million bushels, was exceeded only by the 1928 total of 1,990 million. The 1943 provisional total, given in Tables I and IV, is 1,440 million.

British stocks of wheat and flour have certainly fluctuated a good deal, from dangerously low to comfortably ample dimensions. There is good reason to believe that they were relatively large, much above prewar levels, on July 31, 1943; but we have no reliable basis for the specific guesstimates inserted in Table II. Germany also probably continues to hold large emergency reserves of bread grain, but we reason that wheat and rye stocks in Continental Europe ex-Russia as a whole were drawn down to the lowest level since 1925.[3]

The British Isles have harvested bumper crops from enlarged acreages. India, Turkey, and Egypt all have record or near-record wheat crops, and those in French North Africa appear to have been at least fair. Bread-grain crops in the USSR may be of average size or larger in the areas that were under Soviet control last winter and spring, but we doubt if the harvests gathered from lands recently reconquered will be nearly as good. From areas of the USSR behind the Nazi lines after harvest, Germany may be able to drain considerable supplies even if the crops are small.

Continental Europe ex-Russia will apparently have the largest wheat crop since 1939, though considerably below prewar levels. This is already leading to some relaxation of severe restrictions on wheat utilization, releasing other grains for enlarging feed use. The consequence is likely to be some increase in numbers of pigs and cattle, and in their food productivity.

Food consumption of wheat in 1943–44 will be appreciably larger than in 1942–43, in the aggregate and in many if not most countries. Nonfood uses outside Europe were exceptionally large in the past season, but will be much larger in this one. Feed use will be increased materially further, especially in the United States. Extraordinary use for industrial fuel is in prospect for Argentina, because of the failure of her maize crop and continuing obstacles to imports of coal and oil. Increased amounts may also be used for manufacture of industrial alcohol in the United States, Canada, and Australia, though the rate of such diversion in the United States is being reduced from the high rate of the early summer.

Total domestic utilization of wheat in the four chief exporting countries will almost certainly be above the record level of about 1,300 million bushels reached in 1942–43. Nevertheless, these countries can all be expected to have enough surplus over liberal domestic use to provide all the exports that will be effectively called for and leave ample carryovers for 1944–45. Prospects indeed warrant restrictions on alcohol manufacture from grain in the United States, moderation in the degree of expansion of feed use of wheat here, and drafts on Canadian surpluses of wheat, oats, and barley, lest our own "granary" be unduly depleted in feeding our swollen livestock population. It is earnestly to be hoped that both economic and diplomatic obstacles to Argentine imports of coal and oil will be surmounted, so that more Argentine grain and linseed may be saved for higher uses than fuel.

Sound management applied to abundant wheat resources can insure that all military, lend-lease, relief, and commercial demands for export shipment in 1943–44 will be supplied. The difficulties lie in achieving such management. The urgent need for a United Nations policy and plan for handling relief of liberated areas, in Europe and the Orient as well, has yet to be met, though progress in this direction is being made.

How large the effective demands for overseas shipment will actually be, no one can safely predict. Much will depend on the degree to which ocean shipping eases further, on the time of opening of the Dardanelles route to the Black Sea, on the rates at which Russian territory and population are won back and at which Hitler's "Festung Europa" becomes accessible to the United Nations, and on conditions of internal destruction, transport, and civil order in liberated areas. Even on the most optimistic assumptions, however, we cannot estimate Eurasian drafts upon overseas wheat supplies in 1943–44 as high as 800 million bushels, whereas the four exporting countries alone could comfortably spare over 1,000 million. On a more reasonable but still optimistic basis, such drafts seem to us unlikely to reach 600 million.

[3] Cf. Table II and WHEAT STUDIES, December 1940, XVII, 216.

Beyond a doubt, both undernutrition and malnutrition are abnormally widespread in Continental Europe, what is termed semistarvation is all too prevalent, and what the layman calls death by starvation occurs to some extent in a few countries. There are, however, no reliable quantitative measures of the food deficiency. Much of the underconsumption is due to maldistribution of food supplies, complicated by shortage of land transport facilities, and some to ruthless official discrimination. As was learned in North Africa, an essential phase of food relief is the supply of nonfood consumer goods and farm supplies that facilitate local dis-hoarding of foodstuffs. No less vital are rehabilitation of domestic transport and trading, and establishing of a currency in which farmers will have confidence. It is not easy to exaggerate the volume of foodstuffs that Europe would absorb if barriers of supply, shipment, finance, and distribution could be miraculously surmounted. But it is all too easy, and too common even in official circles, to exaggerate the European deficit in calorie foods, and especially in cereals, that will need to be covered as promptly as possible.

Wheat and flour, shipped in to supplement important homegrown supplies of cereals and potatoes, can be counted upon to play the major role in dispelling hunger in liberated areas—eventually all of Continental Europe and parts of the USSR. Dried beans and peas, fats and oils, and sugar[4] will also play important parts. At present there is no assurance that needs for fats and protein can be quickly met; but there will be large supplies of lard from the United States, and of soybean products also that will help if they can be palatably utilized. Still less assured are adequate supplies of various milk products for relief uses. There is no possibility of promptly restoring food consumption in Continental Europe to prewar levels of palatability and preference, to say nothing of reaching a higher normal soon. But the more modest goals of relieving hunger, and substantially improving nutritional status from the depressed wartime level, are attainable. The most crucial problems are those of management, not of potentially available supplies of calorie foodstuffs.

International movement of wheat continues restricted. Aggregate net exports in August–July 1942–43 almost certainly fell below 400 million bushels, for the first time since 1890–91.[5] Blockades, shipping shortages, and other transport difficulties severely limit shipments of wheat from where it is abundant to where it is scarce. Net exports of the four chief exporting countries totaled something like 340–350 million, the lowest since 1911–12.[6] In the past three years, they have been about 23 per cent smaller than in corresponding years of World War I, as shown by the following annual data in million bushels for August–July years:

1913–14	416	1938–39	485
1914–15	497	1939–40	504
1915–16	608	1940–41	451
1916–17	471	1941–42	367
1917–18	429	1942–43	342
1918–19	585	1943–44	...

World net exports during the present war have been farther below those of World War I than these figures indicate. In most years of the earlier period India was an important net exporter, while the Russian Empire was an outstanding net exporter prior to 1914–15.

Canada continues to do the lion's share of the export trade, Argentina shipping about a third as much, and Australia perhaps half as much as Argentina. Net shipments from the United States probably did not reach 30 million bushels in July–June 1942–43, after allowance for Canadian wheat milled in bond and small imports of Canadian wheat for feed use. With current increases in the last category, and suspension of export subsidization since June, the United States now seems likely to be a net importer in 1943–44.

[4] On Aug. 21, 1943 official announcement was made of completion of negotiations for CCC purchase of a minimum of 4 million short tons of 1944-crop Cuban sugar, as compared with 3 million of the 1943 crop, at the same price as last year (2.65 cents per pound, f.o.b. Cuban ports). This purchase is designed in part for supplying requirements of other United Nations. *Department of State Bulletin* (U.S.), Aug. 21, 1943, p. 116. The contract was formally signed on Sept. 22.

[5] Helen C. Farnsworth, "Decline and Recovery of Wheat Prices in the 'Nineties," WHEAT STUDIES, June–July 1934, X, 348.

[6] Cf. Table IV, and M. K. Bennett, *op. cit.*, p. 110.

When the veil over trade statistics is lifted, however, it will probably appear that the international movement of wheat and flour during the summer was considerably larger in 1943 than in 1942, notably from Canada. This is chiefly because shipping has become easier and safer in the Atlantic and Mediterranean, and because Britain has been attempting to build up stocks in preparation for invasion of the Continent. The proportion shipped as flour, including that for armed forces overseas, is already high, and in the current crop year it may be high beyond any recent experience. The proportion of flour to wheat in Canadian shipments to Soviet Russia, however, may be at least temporarily lower, owing to repair or reconstruction of Russian flour mills that had been damaged or destroyed.

Wheat acreage sown for this year's crops was probably the lowest since 1925 or 1926—in the four chief exporting countries under 100 million acres, and in the world ex-Russia as a whole under 250 million. However, an upturn in wheat acreage has already begun. In the British Isles and Continental Europe acreage sown for 1943 was stepped up, in the aggregate by probably 1–3 million acres, and harvested acreage was at least 5 million acres larger than in 1942. Spring-wheat acreage in the United States for harvest in 1943 was increased by over 2 million acres. Something like one-fourth of this increase represented reseeding of fall-sown acreage abandoned, chiefly in the Pacific Northwest, but the bulk of it was in response to relaxation of official restrictions and belated encouragement of additional plantings. The Argentine wheat acreage sown, according to the first official estimate, is 0.3 million acres larger than in 1942.

Winter-wheat acreage planted this fall in the United States, plus that sown next spring, may well approach if not exceed the goal of 68 million acres announced on July 13. This goal may be compared with the low of 52.5 million sown for the crop of 1942 and the peak of 80.8 million sown for harvest in 1937 (Table VIII). Canada and Australia, unless their surpluses should continue to seem unduly burdensome early in 1944, are likely to relax their acreage restrictions for 1944 harvests, to an extent depending upon prospective outlets.

The International Wheat Council, which was set up under the preliminary International Wheat Agreement that became effective June 27, 1942, has held three regular sessions but taken no significant action. We doubt if either the Council or its Executive Committee was consulted before official decisions were taken, in the United States and Argentina, to remove restrictions on wheat sowings and encourage expansion of wheat acreage. As yet there is no indication that the Council will rise to the limited opportunities that seem to us to be within its grasp, pending the contemplated activation of additional provisions of the Draft Convention.[7]

Wheat prices continue at artificial levels which vary greatly from country to country, under diverse influences of national programs and pressure groups. Despite extremely large supplies, wheat prices in North America have tended generally upward; and recently they have risen impressively further under the joint influence of political and economic forces. As heretofore, the current level is most artificially high in the United States, and persistent political boosting of farm prices here is having far-reaching international influence. In response to strongly increased demands for Canadian wheat, and rising prices, the Canadian Wheat Board now has a virtual monopoly of marketing it for this crop year and the next; and from September 28 it will make an initial advance of $1.25 (Canadian) per bushel, 35 cents above the previous guaranteed minimum.

Wheat prices have been conspicuously depressed in the two Southern Hemisphere wheat-exporting countries, but higher export prices already reflect the influence of advances in North American markets. The maize shortage in Argentina has helped to boost wheat prices there, and the new government has avowed anti-restrictionist, pro-producer agricultural policies. The Labor Party in Australia won a general election on August 21,

[7] See J. S. Davis, "New International Wheat Agreements," WHEAT STUDIES, November 1942, XIX, 25–83, esp. p. 75. On the third session of the Council, in August 1943, no press release was issued.

although one of its two opponents, the Country Party, had strenuously demanded higher prices for wheat and more liberal treatment of farmers otherwise. Argentina and Australia, however, are likely to be able and willing to undersell Canada and the United States on unsubsidized export business in the year ahead, to the full extent that shipping facilities and allocations permit.

UNITED STATES

Official estimates of the United States wheat crop of 1943 were raised from the low of June 1 to a level on August 1 that was maintained a month later. Following are data in million bushels:

Date	Total	Winter	Spring
June 1	731	502[a]	229
July 1	791	519	272
Aug. 1	835	534	301
Sept. 1	835	534[b]	301
Net change	+104	+ 32	+ 72

[a] The Dec. 1 "indication" was 625, the April 1 forecast 559, the May 1 forecast 515.
[b] Unrevised.

The crop now indicated is the result of good yields on a small seeded acreage. It is rather above average size, though 12 of the preceding 30 crops materially exceeded it (Chart 3, p. 3).

Domestic supplies of wheat for the crop year 1943–44, including the carryover now officially estimated at 618 million bushels,[1] add up to 1,453 million bushels, only 160 million less than the all-time record set last year. Further revisions are unlikely to change this picture radically. This total is ample to provide for expanded domestic utilization in all categories, and for the limited exports that are in prospect, as well as to leave a substantial balance for carryover, provided that diversion of domestic wheat to feed and alcohol manufacture is kept from going to extremes. So great, however, are current demands for feed use, for a livestock population of unprecedented size, that importations of Canadian wheat and coarse grains are likely to be as heavy as restricted rail and water transportation facilities will permit (p. 13).

Since wheat has become complementary to corn as a feed grain and source of alcohol, it is pertinent also to give successive estimates of the corn crop in 1942 and 1943, in million bushels:

Date	1942	1943
July 1	2,628	2,707
Aug. 1	2,754	2,875
Sept. 1	3,016	2,985
Oct. 1	3,132	....
Dec. 1	3,175	....

The September estimate, which will undergo further revision, was larger than the final estimate for any year except 1906 (3,033 million bushels), 1920 (3,071 million), and 1942.

Last season's experience with serious congestion of grain-storage facilities[2] is not being repeated this year. Aggregate supplies are not quite so large. Current utilization is on a higher level. Also, storage capacity for grains, soybeans, dry beans, and flaxseed has been increased materially in recent years. Surveys by the Bureau of Agricultural Economics show the following in million bushels:[3]

Survey date	Total	Bulk	Sacked	Crib
1941 Mar. 1	1,535	1,197	323	15
1942 Feb. 16	1,601	1,271	315	15
1943 Apr. 1	1,667	1,344	308	15

There have also been considerable increases in farm storage facilities and in CCC steel and wooden bins, which are not included in the above figures.[4]

With one exception, all classes of wheat are in ample supply (Table IX). Soft red winter wheat, which is preferred for cracker, biscuit, and pastry flour, is scarce. In 1942–43 this type of wheat was in rather short supply, in sharp contrast to the huge supplies of hard winter and spring wheat, and soft red winters commanded unusual though by no means extreme premiums. The carryover was large in

[1] See Tables III, IV. This may be compared with a 1932–41 average of 235 million bushels of old wheat, according to latest official estimates that involve deductions for some new wheat that was included in commercial and mill stocks prior to 1937. That decade included the two largest carryovers in our prewar history, in 1932 and 1933.

[2] WHEAT STUDIES, September 1942, XIX, 9–11.

[3] BAE release of May 10, 1943, *Grain Storage Capacity and Stocks, April 1, 1943*, and corresponding release of Apr. 3, 1942.

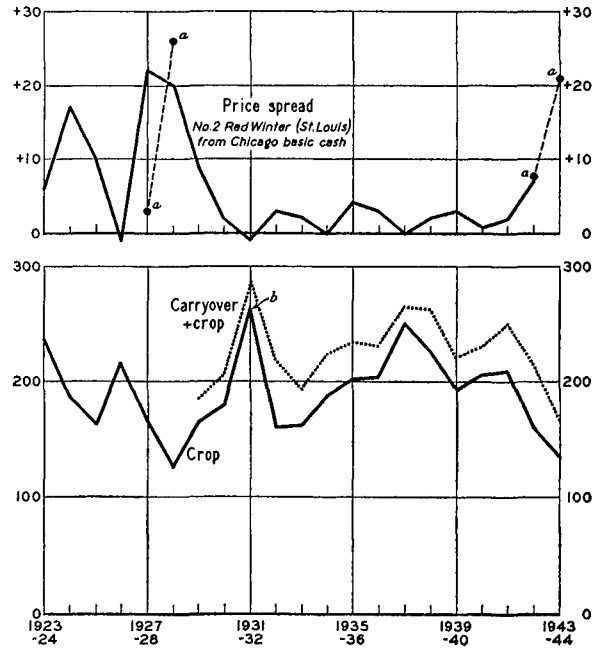
[4] Of slight importance is the exclusion of small feed stores in North Atlantic states with capacities under 2,000 bushels.

1942 and moderate in 1943. This season both crop and total supplies are exceptionally short, much as in 1928–29, when winterkilling was extremely severe.[5] Chart 4 is relevant. For both 1942 and 1943 crops, soybeans heavily competed with winter wheat for midwestern acreage,[6] while AAA restrictions on sowing winter wheat continued operative. This year winterkilling was somewhat above average, yields per harvested acre were below the 10-year average in four of the five most important states producing this type, and some of the crop is below current milling standards. Premiums on soft red winters are again exceptionally high (Table XI).

Opportunities for relief of the shortage are limited. The current feed scarcity in most states that produce soft red wheat will tend to keep on farms a larger fraction of the new crop, despite relatively high prices offered by mills. OPA price ceilings on soft wheat flour were raised relative to bread flours, effective March 2, except in the Pacific Northwest. Soft white wheat and its flour will be drawn from the Pacific Northwest and intermountain states, where new OPA flour-price ceilings effective August 25 were put higher for shipments east of the Rockies than on other sales; but this movement is being restricted by shortages of transportation facilities. Some soft white wheat produced elsewhere, and more of the lower-protein hard wheats, will be blended into biscuit and pastry flours.[7] For the coming year, elimination of all restrictions on wheat seeding and attractive prices for soft red winters will tend to expand sown acreage, and the state goals announced on August 14 call for substantial expansion over the acreage sown for 1943 (Table VIII); but competition of soybeans will presumably continue very strong.

CHART 4.—SOFT RED WINTER WHEAT PRICE PREMIUMS, CROPS, AND SUPPLIES, 1923–43*

(Cents per bushel; million bushels)



* Official estimates of crops and carryovers, the latter available only from 1929. Price spreads computed by Food Research Institute; cf. weekly data in Table XI.

[a] August averages.

[b] In the whole period (1919–43) for which crop estimates by classes are available, the 1931 crop of soft red winter ranked second only to the huge crop of 1919, which was 357 million bushels.

Flour production in the United States was exceptionally large in 1942–43. According to Holbrook Working's method of estimate, total millings were 121.5 million barrels or, in the new unit now officially in use, 238 million cwt., sacks, or centals of 100 pounds.[8] The wheat ground for flour, 552 million bushels, approached the high levels of 1928–29 and 1929–30.[9] If grindings for granular flour (p. 11) are added, the total exceeded all but the previous record of 605 million bushels in

[5] Cf. WHEAT STUDIES, December 1929, VI, 46.

[6] Planted acreages of wheat and soybeans in the seven midwestern states that normally produce the bulk of the soft red winter wheat (cf. Table VIII) have been as follows, in thousand acres:

Harvest year	Wheat	Soybeans
1935–39 av.	10,671	5,350
1940	8,207	7,953
1941	8,427	7,032
1942	5,963	10,444
1943	6,035	11,014

[7] Cf. WHEAT STUDIES, December 1929, VI, 75–76.

[8] The unit of 100 pounds was officially adopted as of May 1, by order of the War Production Board. Three short terms for this unit are available, and at least two are being used. Since "cwt." and "sack" are commonly used in Great Britain to mean 112 and 280 pounds respectively, and flour sacks of various sizes are used in this country, we believe that the unambiguous international term "cental" should be made official, though it may not hitherto have been used for flour.

[9] Cf. WHEAT STUDIES, December 1940, XVII, 214.

1919–20. Monthly data show that production ran especially high from September through March (Table V). After the slump in April–May, recovery in June and July was only moderate, but a sharp upturn in August is indicated by incomplete unofficial data.[10] It is reasonable to expect mill output in 1943–44 to approach the previous record.

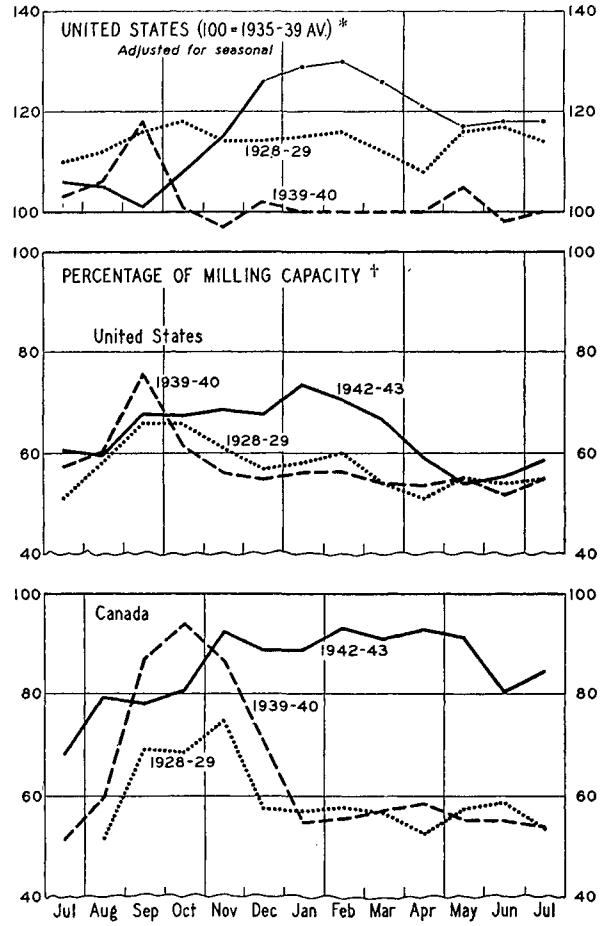
Seasonal variations in flour production are fairly pronounced. Accordingly, a somewhat different picture is shown if adjustments are made for average seasonal variations. The top section of Chart 5 shows such an index of flour output for 1942–43 (top curve), 1939–40, and 1928–29, the year of prewar peak production. The latest eight figures plotted should be replaced by revisions received while this study was in page proof. These show a December–January rise from 120 to 134, a steady decline to 97 in May, and recovery to 102 and 103 in June and July.

Another useful index is plotted in the middle section of Chart 5. For the same three crop years, it shows monthly percentages of daily milling capacity operated by mills reporting to the Bureau of the Census.[11] This correctly implies that existing mills, if adequately supplied with manpower and machinery in good repair,[12] could turn out a volume of flour much larger than they did last year. The lowest section, to which further reference is made below (p. 13), shows that Canadian mills have recently been operating at much higher percentages of capacity than American mills. The rise during the war, and especially in the past year, has been much more striking in Canada, as shown by the following crop-year averages:

Year	United States July–June	Canada Aug.–July
1928–29	57.6	59.8
1938–39	57.1	56.6
1939–40	57.8	65.7
1940–41	58.7	72.5
1941–42	59.3	73.5
1942–43	63.6	86.8

In the absence of published official data, it is not clear to us how much, if at all, flour shipments out of the United States have increased above the undisclosed level of 1941–

CHART 5.—INDEXES OF NORTH AMERICAN FLOUR OUTPUT AND MILLING ACTIVITY, 1942–43 WITH COMPARISONS



* *Federal Reserve Bulletin*, September 1943, XXIX, 880, and earlier issues. See column 1 for important revisions in this index from December 1942.

† From official data from large but variable numbers of reporting mills. Milling capacity is lower than before the war.

42. We believe they have increased, and they may have exceeded the volume of net exports and shipments in the three years ending with 1940–41, which ran close to 14 million cwt.[13]

[10] *Northwestern Miller* (Minneapolis), Sept. 8, 1943, p. 14.

[11] The percentages would be considerably lower (perhaps 56–57 per cent) if based on *total* American milling capacity. Nourse, in 1934, computed annual percentages of total capacity (assuming 306 working days per year) utilized by crop years from 1900–01 to 1929–30, and got figures ranging from 29.2 in 1920–21 to 44.1 in 1929–30. E. G. Nourse, *America's Capacity to Produce* (Washington, 1934), pp. 186–93, 572–73.

[12] Millers are not yet satisfied with recent WPB allotments in this connection.

[13] Cf. WHEAT STUDIES, December 1941, XVIII, 186.

Comprehensively considered, such external disposition now includes (*a*) commercial exports of flour, ground either from domestic wheat or from imported wheat milled in bond, (*b*) commercial shipments to Hawaii, Alaska, and Puerto Rico, (*c*) governmental shipments to these and other territories, (*d*) lend-lease shipments, and (*e*) armed forces' shipments to bases overseas. Under the operation of "lend-lease in reverse," many of our overseas forces are fed on British, North African, and Australian flour. Hence we doubt if the expansion in item *e* has yet attained large dimensions. Yet it is probably on the increase, in view of the recent decision that relief operations will be conducted by the armed services during the first few months of occupation of liberated areas.

However, Army purchases for current consumption and for normal flour stocks within the United States, for armed forces here or for expected shipment overseas,[14] go far toward explaining indicated increases in output and apparent domestic retention in the past year. Civilian consumption per capita has probably risen above the level of about 154 pounds that had persisted for several years, but any such increase cannot yet have been large in percentage terms.

Gross exports and shipments of United States flour seem likely to be considerably higher in the current year. Exports of United States wheat grain must have been quite small in 1942–43, and the present prospect is that they will continue small this year. If one recent scheme should prove practical, however, they may be larger. According to a report as yet unconfirmed, Canadian exporters sold 12 million bushels of wheat to the Mexican government (a huge purchase for that country), part of it for deferred delivery; the CCC in turn proposed to cover the 5 million sale for prompt delivery out of its stocks of hard winter wheat at Gulf ports, taking delivery of equivalent Canadian wheat at American lake ports for feed use in the East and Northeast.[15] Such a swap, if acceptable to the purchaser, would economize on transportation—a result much to be desired.

Net exports of wheat and flour, plus shipments to possessions, can be expected to continue small in 1943–44. A recent official forecast put the total at 35 million bushels.[16] It seems to us more likely that the net total will be smaller; indeed, we deem it probable that imports of Canadian and other wheat for feed use and milling in bond will exceed United States exports of wheat and flour.

The official estimate of feed use of wheat in July–June 1942–43 is 310 million bushels, a record volume.[17] This included about 100 million fed on farms where grown, and 210 million of CCC wheat sold at reduced prices for feed use. Out of the total of 275 million thus sold before June 30, about 65 million had not yet disappeared into feed channels and was included in the carryover. Recent official forecasts of disposition in 1943–44, which are rough at best, suggest total feed use of 425 million bushels. This includes the 65 million sold for such use by June 30, the entire amount owned by the CCC on that date,[18] and additional domestic and Canadian wheat purchased by the CCC for feed use. On April 21 the purchase of 7.25 million bushels of Canadian wheat was reported, on June 28 another 2 million, and 10 million more were bought in July–August.[19] In these two months CCC sales for feed use totaled 88.6 million bushels. Special efforts are being made to supply grain to dairy farmers in wide sections of Delaware, Maryland, Virginia, West Virginia, and North Carolina that have been ravaged by drought during the summer and to other drought areas of the Southwest.

Industrial utilization of wheat, never before of quantitative importance, is now absorbing substantial amounts. In July–June 1942–43 about 60 million bushels of wheat was used in

[14] See an illuminating article, "Army Does Not Hoard Food," by Maj. Gen. E. B. Gregory, Quartermaster General, U.S. Army, in *Northwestern Miller*, July 7, 1943, pp. 42, 44, 46.

[15] *Kansas City Grain Market Review*, Sept. 18, 1943.

[16] *Wheat Situation* (U.S. Dept. Agr.), August 1943, p. 7.

[17] *Ibid.*, p. 10. For October–September possibly 470.

[18] Expressed as 215 million in *ibid.*, but including not more than 204 million of United States wheat "owned and pooled" by the CCC as of June 30. Some purchased Canadian wheat may be included.

[19] U.S. Dept. Agr., Press Releases 2183-43, Apr. 21, and 466-44-2, Sept. 1, 1943; *Winnipeg Free Press*, June 29, 1943, p. 14.

the manufacture of industrial alcohol. This included increasing amounts that were first ground by mills into granular flour, reported monthly as follows:[20]

Month	Number of mills	Million bushels
Jan.–June	..	22.07
Jan.	18	1.78
Feb.	28	2.16
Mar.	35	3.87
Apr.	40	3.76
May	43	4.86
June	45	5.64
July	37	3.54

Authority of the CCC to sell wheat to mills at discount prices for such processing, however, lapsed on June 30. Processing of stocks previously acquired accounts for part of the reduced grindings in July and later.

CCC sales of wheat for industrial alcohol manufacture, direct or via granular flour, totaled about 3.5 million bushels in 1941–42 and 70 million in 1942–43. Such sales in July–August 1943 were negligible, since recent legislation does not permit it to sell wheat below wheat-parity prices except for feed use; but the Defense Supplies Corporation (a subsidiary of the Reconstruction Finance Corporation) is subsidizing distillers in the production of war alcohol from grain. Because of extreme demands for wheat as feed, efforts are wisely being made to reduce the rate of conversion of grain to alcohol. Stocks of alcohol are fairly heavy, pending the completion of synthetic rubber plants. Easier shipping promises to permit heavier imports of molasses from the West Indies and Hawaii, and most of the Gulf and some of the Atlantic distilleries are likely soon again to be processing molasses. Though recent BAE estimates indicated 125 million bushels as the probable utilization of wheat for alcohol in 1943–44,[21] we are disposed to expect the total to be smaller—as we think it should be.

Successive measures backed by agrarian pressure groups and the political farm bloc have been the dominant causes of striking advances in wheat prices during the past three years, even while North American carryovers rose to unprecedented heights (Table III). The principal lever has been the raising of nonrecourse-loan rates, fixed according to statutory formulas which have been revised upward despite presidential resistance. The table at the foot of this page shows certain comparisons for August 1938–43. Additional influences, especially important in recent months, have been government purchases of flour for armed services and lend-lease, and CCC purchases for feed use at any price below loan rates. Speculation, often based chiefly on anticipation of fresh legislation or administrative actions, has chiefly affected the course of the rise. Latterly these forces have driven prices in most areas above loan levels, contrary to previous experience so early in the marketing year.[22] The latest stimulus was given when, on September 28, the House Committee on Agriculture unanimously approved a bill to set price floors for basic crops at parity levels. Such price floors would be more than 20 cents a bushel above present loan rates.

FARM AND PARITY PRICES OF WHEAT, AND LOAN RATES, 1938–43*

(Cents per bushel)

August	Farm price	Parity price	Loan rates					
			Farm basis	No. 2 H.W. (Chi.)	No. 2 H.W. (K.C.)	No. 2 R.W. (St.L.)	No. 1 Dk.N.S. (Mnpls.)	Soft White (Port.)
1938..	51	112	59[a]	77	72	73	81	67
1939..	54	110	61[a]	80	77	80	87	73
1940..	60	112	64[a]	81	77	81	87	73
1941..	88	120	98[b]	115	110	115	115	105
1942..	95	134	114[b]	132	127	132	132	121
1943..	127	146	123[b]	142	137	142	142	130[c]

* Official data. For corresponding market prices, see Table XI.

[a] As subsequently computed, the average rate on wheat actually put under loan worked out to 53 cents in 1938–39, to 64 cents in 1939–40, and to 65.5 cents in 1940–41.

[b] Initially the loan rate was fixed near the bottom of the range of 52–75 per cent of parity, farm basis. By action of the Congress in May 1941, the minimum was raised to 85 per cent of parity. Public, No. 74, 77th Cong.

[c] Including Rex, a bunt-resistant variety that is soft to semi-hard. The rate excluding Rex is 4 cents higher.

[20] *Wheat Ground and Wheat Milling Products* (U.S. Dept. Comm.), January–July 1943.

[21] *Wheat Situation*, August 1943, p. 7. The current WPB program calls for the production of about 500 million gallons of ethyl alcohol in the year ending next July. *Northwestern Miller*, Sept. 15, 1943, p. 11.

[22] See chart comparing loan values and monthly average prices of No. 2 Hard Winter at Kansas City, in *Wheat Situation*, May–June 1943, p. 1.

Despite the upsurge in demand for wheat for feed, it cannot be too strongly emphasized that wheat prices in the United States, even before the latest advances, have been boosted to levels abnormally high, considering the abundance of wheat here, in Canada, and in the world as a whole.[23] Such prices yield wheat growers returns which are extremely, unwarrantedly high,[24] and which are still being supplemented by conservation and parity payments (Table X). Along with similar policies affecting corn, they have forced the Administration to set support prices for "war crops" and hogs much higher than would otherwise be necessary to induce desired expansion in output.

These moves have helped to raise costs and prices of meat, milk, eggs, and other animal products, and impelled the Administration to resort to various forms of subsidy to reduce retail prices. They have well-nigh wrecked the system of price control, disturbed the flow of grain and the marketing of meat animals, and are currently responsible for serious squeezes between flour-price ceilings and the prices that millers have to pay for their grist. They have already contributed heavily to inflationary pressures, and are increasingly weakening resistance to those pressures. Through influence on wheat prices in other countries and otherwise, political inflation of farm-product prices in the United States will needlessly increase the drain on public treasuries (probably that of the United States especially) to provide supplies for Allied and relief disposition, and will go far toward rendering inevitable a postwar collapse of agricultural prices from inflated levels.

To reverse this tide, and to put our wartime food management on a rational basis, calls for outstanding political courage in the Congress and the Administration.[25]

[23] Far higher prices of wheat in World War I reflected scarcity rather than abundance.

[24] Rough calculations make this very clear, but presentation of summary figures is deferred until more definitive official data become available.

[25] Cf. J. S. Davis, "Wartime Food Management: An Analysis with Recommendations," *Economic Sentinel* (Los Angeles Chamber of Commerce), Aug. 11, 1943, I, 1–46; W. I. Myers, "The United States Food Situation and Outlook," address at National Food Conference, Chicago, Sept. 17, 1943.

Other Overseas Exporters

Canada. — Thanks to last year's bumper harvests, Canadian carryovers of grain were enormous, as shown by the following figures:

July 31	Million bushels				Percentage of preceding crop			
	Wheat	Rye	Barley	Oats	Wheat	Rye	Barley	Oats
1938 ...	25	1.0	6.4	20.7	14	17	8	7
1939 ...	103	2.9	12.8	51.9	29	26	13	13
1940 ...	300	5.4	12.7	49.9	58	35	12	12
1941 ...	480	4.9	10.9	44.2	89	35	10	11
1942 ...	424	3.4	10.8	30.4	135	29	10	9
1943 ...	601	15.3	69.3	158.7	108[a]	62	27	23
Crop of 1943 ...	296	8.5	222.7	530.8	53[a]	34	86	77

[a] Taking the 1942 crop as 557 million bushels, 36 million below the unrevised official estimate.

The current agricultural season, however, has been much less favorable than that of 1942, and notably poor in Ontario and parts of the two western Prairie Provinces. Harvests of oats and barley, despite expanded acreage, are below 1942 record production, though hay and flaxseed crops are larger than last year. The short crops in Ontario mean serious feed scarcity there, and shortages of railway facilities and manpower hamper its relief by shipments from the Prairie Provinces. Since Ontario's wheat is mostly soft winter, scarcity of that type is no less severe than in the United States.

The September official estimate of the wheat crop is 296 million bushels, reflecting yields well above average (16.9 bushels per acre) on a severely restricted acreage — the smallest since 1918. Such a crop, though below the 30-year average of 341 million bushels, is by no means small.

Canadian wheat supplies for the current crop year, now estimated at nearly 900 million bushels, are nevertheless larger than in any year previous to 1942–43, when the carryover was exceptionally large and the crop of near-record size even after allowance (36 million bushels) for a recently indicated overestimate. Such supplies seem ample (1) to provide for further expansion in Canadian utilization for seed, food, feed, and alcohol; (2) to take care of all prospective exports to the United Kingdom, Continental Europe, the USSR, and miscellaneous ex-European markets; (3) to permit as heavy exports to the United States for

feed use (in addition to oats and barley) as shipping facilities will permit; and yet (4) to leave a large carryover in July 1944.

Canadians are fully conscious of the huge volume of their wheat supplies, and can be expected to see that the resource is put to good use as channels of disposition open up. Exports in the past crop year probably exceeded 200 million bushels, but may not have reached the level of either of the two preceding crop years.[1] They can be impressively larger in 1943–44.

By the end of July 1943 over 90 million bushels of dutiable Canadian oats and barley had moved to the United States.[2] Of the Canadian wheat sold to the CCC (duty status not yet finally settled) for feed use in the United States since mid-April 1943 (p. 10), apparently not over 1 or 2 million bushels had been exported by the end of July. On such sales of grain, procedures have been worked out to give all Canadian growers the benefit of the higher prices realized on export sales.[3] Shortages of railway cars, severe competition of priority ore traffic on the Great Lakes, and shortage of tonnage for coastwise movement from Vancouver south, have continued to restrict the volume moved. However, on August 6 the chairman of the New York State Emergency Food Committee said that Great Lakes shipping space had been assured for 2½ million tons of feed grain, mostly Canadian wheat, barley, and oats, to be shipped into Buffalo for distribution through the northeastern states, to relieve feed shortages there.[4] Other lake shipments are being made to Duluth. Rail shipments to the intermountain states and barge shipments to Pacific Coast ports are under way. Further steps are being taken in pursuance of agreements reported reached at Quebec late in August to facilitate the grain movement. These included commitments by British authorities to a temporary cut-back of British imports from Canada and to use of new-built British vessels in the lake trade until lake navigation closes.[5] Canadian shipments to the United States from August 1 to September 16, mostly for feed use here but some for shipment overseas, included 17.9 million bushels of wheat, 7.8 million of oats, and 6.1 million of barley.[6]

Canadian flour mills have been operating to an unusually high percentage of capacity during most of the crop year ending July 31, 1943 (Chart 5, p. 9); and both mill grindings of wheat and flour production were more than 10 per cent above the previous peak of 1928–29. Domestic absorption has been relatively heavy, with flour and bread kept cheap by subsidies paid to millers to offset higher market prices for wheat.[7] As was usual prior to the 1930's, over half of the flour output has moved overseas, this year chiefly on British and Russian purchases. Canadian flour exports in the 10 months ending May 31 were 10.2 million barrels—the equivalent of 46 million bushels of wheat, 6 million more than in the same period of 1941–42 (Table VI); and we infer that for the whole crop year they exceeded the previous peak of 12 million barrels reached in 1923–24.[8]

The day after Italy's surrender was revealed, the Canadian Minister of Commerce announced that the British had ordered 1 million tons of Canadian flour and ½ million tons of Australian[9]—in total equivalent to about 15 million barrels or 69 million bushels of wheat equivalent. This is a huge order. We interpret it as an additional move to "back the attack" on the Continent, and as reflecting British confidence that shipping will be available even to move Australian flour to Europe.

[1] See Table IV for our preliminary estimate, and Table VI for available monthly data. In August–May the total was 163 million bushels in 1942–43, as compared with 192 and 177 in the same ten months of 1941–42 and 1940–41. *Monthly Review of the Wheat Situation* (Canada Dominion Bureau of Statistics), Sept. 24, 1943, p. 17.

[2] *Canadian Coarse Grains* (Canada Dominion Bureau of Statistics), Aug. 16, 1943, p. 9.

[3] *Ibid.*, Mar. 14, 1943, p. 11; and *Current Review of Agricultural Conditions in Canada* (Canada Dominion Bureau of Statistics), August 1943, IV, 5–6; *New York Times*, Sept. 18, 1943, p. 25.

[4] *New York Times*, Aug. 7, 1943, p. 14.

[5] *Northwestern Miller*, Sept. 8, 1943, p. 23.

[6] *Southwestern Miller* (Kansas City, Mo.), Sept. 28, 1943, p. 28.

[7] WHEAT STUDIES, January 1943, XIX, 131.

[8] *Quarterly Bulletin of Agricultural Statistics* (Canada Dominion Bureau of Statistics), July–September 1941, XXXIV, 206.

[9] *Winnipeg Free Press*, Sept. 10, 1943, p. 15. Australia's Premier Scully had announced the Australian order on Sept. 7.

The order, on which work had already begun, can be expected to keep Canadian flour mills operating as fully as practicable and to enlarge operations of Australian mills.

The new minimum price in Canada, announced on September 28, is $1.25 (Canadian) per bushel, basis No. 1 Northern in store at Fort William–Port Arthur.[10] Now called an "initial advance," this is applicable through the crop years 1943–44 and 1944–45. Comparable guaranteed minimum prices were 90 cents last year and 70 cents in each of the three preceding crop years, on wheat sold to the Canadian Wheat Board. Now the CWB will dominate the purchase and sale of Canadian wheat.[11] The newly established price floor is 3–5 cents above the high point to which speculation had forced cash and futures prices prior to the suspension of open trading on the Winnipeg market on September 28. It seems to imply raising the subsidy on wheat milled for domestic consumption to about 48 cents (Canadian) a bushel. In United States currency equivalent, however, the new Winnipeg price is $1.14 for No. 1 Manitoba Northern—far below comparable United States market prices.

Supporting the speculative advance in Winnipeg in recent weeks were large wheat purchases by the CCC for feed use in the United States, heavy export sales to the United Kingdom, European neutrals, Mexico, and presumably Soviet Russia, and fair prospects for rising export demands centering on Canada. The market got out of control by the CWB. But one can hardly avoid inferring that one factor in the Dominion government's decision was the political "necessity," in view of an approaching general election, of meeting politico-economic demands from western farmers unable or unwilling to understand why United States growers should get so much better prices than Canadian.

Argentina.—The Argentine wheat position and outlook have undergone radical changes in recent months. Because of serious drought from December into March, the maize harvest of March–May was exceedingly short. The latest estimate of 76 million bushels (Chart 3, p. 3) may be compared with the following rough distribution of the crops of 1913–42, which averaged 272 million bushels:

Size group	Number of crops	Average size	Range
Very large	1	452	452
Large	6	387	340–420
Above average	7	305	277–325
Below average	7	250	224–268
Small	8	179	161–197
Very small	1	59	59

For the first time since 1911, when Argentina's maize crop was the smallest in this century (28 million bushels), the Union of South Africa has a crop exceeding that of Argentina.[12]

Argentine wheat exports have been severely restricted, with Brazil and Spain the only important markets. For the year ending July 1943 the total came to only about 69 million bushels. In consequence, wheat stocks, months after harvest, have been at levels well above annual production (Table VII).

The blockades and shipping stringency that were primarily responsible for these developments also almost eliminated exports of maize and gravely curtailed exports of linseed and imports of coal and oil.[13] Consequently, first maize and later linseed also have been very extensively used for industrial fuel, chiefly in power plants.[14] A decree of July 21 prohibited further sales of linseed for burning as such, but linseed is being crushed for oil to be used in stretching mineral oil.[15] Just how much

[10] This supersedes the "fixed minimum price" previously set by the CWB and approved by Order in Council. For schedule of prices based on that 90-cent minimum, see *Monthly Review of the Wheat Situation*, Sept. 24, 1943, p. 6.

[11] The CWB will purchase for government account all unsold wheat stocks in commercial positions in Canada, and presumably futures contracts as well, at closing prices on Sept. 27. Futures closing prices were as follows: October, $1.20¾; December, $1.19⅞; May, $1.16¼.

[12] *Corn Trade News* (Liverpool), Aug. 18, 1943, pp. 314–15; *Agricultural Statistics, 1942* (U.S. Dept. Agr.), p. 58.

[13] See a valuable editorial article on Argentina's fuel position and problems, in *Times of Argentina* (Buenos Aires), Feb. 16, 1943, pp. 5, 10.

[14] *Ibid., passim.*

[15] U.S. Dept. Agr., Press Release 231-44, Aug. 2, 1943. "All consumers of fuel oil, gas oil, and Diesel oil are required to take 20 per cent of their requirements in linseed oil." *Commercial Intelligence Journal* (Canada Department of Trade and Commerce), Aug. 28, 1943, p. 171.

maize and linseed have been so used we are not yet in a position to say, but the indications are that fuel consumption of maize in April–March 1942–43 exceeded the volume of *exports* in any previous crop year (the calendar-year peak was 385 million bushels in 1931) and approached or exceeded the largest *crop* Argentina has ever produced.

Feed use of maize in Argentina has been increasing as the number of hogs has risen strikingly in recent years. Moreover, in the early months of 1943, when the pastures were dried up, stocks of maize and linseed were exceptionally drawn upon for other feed use. The maize surplus melted away, maize trebled in price, and on August 6 exports were prohibited. Meanwhile, stocks of wheat continued embarrassingly heavy. Accordingly, on July 21, the Argentine government authorized the sale of 73 million bushels of wheat (2 million tons) for fuel up to the end of 1943, at a price two-thirds of what the Grain Regulating Board had paid for it.[16]

If Argentine fuel imports cannot be stepped up, still more wheat may be burned before the end of July 1944. All of the wheat of low or doubtful milling quality will presumably disappear in this channel or into feed use, for which the decree of July 21 reserved 18.4 million bushels. Yet it is fair to expect that Argentina will continue to hold sizable stocks of good wheat for export, and we anticipate enlarged exports to Europe in 1943–44.

In the light of the changed situation, the Argentine government has adopted a new policy based on "forthright" efforts to increase agricultural production, eliminating all the restrictive measures previously in force.[17] Last November sales of wheat to the GRB at fixed prices were conditioned on agreement by the sellers to reduce their wheat acreage sown for 1943 by 10 per cent.[18] Since earlier conditions somewhat similar in character had not been enforced, and no efforts at enforcement have come to our attention, we doubt if this significantly affected growers' sowing plans. The disaster to the maize crop, foreseen early in 1943, was confirmed before ground was prepared for wheat seeding. On July 1, near the end of the planting season, the Minister of Agriculture announced that, notwithstanding the obligation to reduce acreage, the new government (following the coup d'état of June 4) would view with favor increased acreage in wheat, linseed, and sunflowers, and would guarantee a market for them at prices yet to be fixed if market prices did not cover production costs.[19]

Neither acreage sown, abandonment, nor yield can yet be forecast with assurance. The Argentine wheat crops of 1913–42 (Chart 3, p. 3) averaged 215 million bushels, and fell roughly into the following size groups:

Size group	Number of crops	Average size	Range
Very large	2	364	349–379
Large	3	289	282–299
Above average	11	234	217–250
Below average	6	193	180–208
Small	6	156	131–169
Very small	2	94	84–105

It is now reasonable to anticipate somewhat larger acreage than in 1942 (about 17 million acres sown) and a wheat crop not far below average size.

Australia.—Australia continues to hold uncomfortably large stocks of wheat. Seed use has been exceptionally low because of official restrictions on acreage, shortages of labor and superphosphate, and adverse weather. Flour consumption has been swelled only moderately under war conditions, in small part through overseas armed forces based there. Much larger increases have taken place in feed use, stimulated by cut-price sales to promote increased output of meats and other animal products.[20] All told, domestic utilization has

[16] *Commercial Intelligence Journal*, Aug. 28, 1943, p. 171. In pesos per quintal the price paid was 6.75, the sale price 4.50. The difference amounts to about 18 U.S. cents per bushel. On July 1 it had been officially stated that the state finances would not permit sales for fuel below the purchase price. *Corn Trade News*, Aug. 18, 1943, p. 314.

[17] U.S. Dept. Agr., Office of Foreign Agricultural Relations Release 475-44, Sept. 3, 1943, quoting Minister of Agriculture General Diego I. Mason on Aug. 21.

[18] *Boletin Informativo* (National Grain and Elevators Commission, Buenos Aires), Dec. 15, 1942, p. 616.

[19] *Times of Argentina*, July 5, 1943, pp. 17–18; *Commercial Intelligence Journal*, Aug. 28, 1943, pp. 170–71.

[20] Decline in flour milling, consequent upon limited export outlets for flour, has led to reduction in millfeed. *Commercial Intelligence Journal*, Aug. 28, 1943, p. 166.

exceeded 60 million bushels (Table IV). Exports, normally far larger than domestic use, have been severely restricted by the shipping stringency. Though official data are withheld, we infer that less than 35 million bushels were exported during the year ending July 1943, inclusive of shipments to United Nations bases in the Pacific and the Middle East. As of July 31, the Australian Wheat Board held about 187 million bushels of wheat unsold;[21] and total stocks within the country, including some sold for export but not yet shipped, probably exceeded 200 million bushels. Australia will presumably end her crop year on November 30 with more wheat than she harvested late in 1942.

The 1943 Australian crop is expected to be small, perhaps comparable to that of 1940 (Table IV). The acreage officially reported planned is 8.3 million acres, the lowest since 1919, when similar conditions held it down to 6.4 million.[22] Trade indications are that the area actually sown may be considerably less. Weather conditions through August were not conducive to high yields. Weeks or even months must elapse before the size of the new harvest can be accurately appraised. In several recent years final estimates have been much above early official forecasts, but this was not true in 1940. A short crop would increase the already vociferous demands of wheat growers for relief, though they have had excellent yields in three years of the last four; but it would relieve pressure on storage facilities and leave Australian reserves heavy.

The easing of the shipping stringency has not yet noticeably affected Australian exports. The recently announced British order for 500,000 tons of Australian flour (p. 13), however, implies that steps are now being taken to utilize Australian milling capacity more fully,[23] presumably in the expectation that the output will be available for United Nations relief uses and for enlarged forces in Pacific theaters of war. It is reasonable to expect Australian exports of wheat and flour to be considerably larger in 1943–44.

Other United Nations

Wheat acreage in the British Isles has been strikingly enlarged during the war, and notably even in the past year. In 1943 both the United Kingdom and Eire are almost sure to harvest more wheat than their bumper crops of last year.

Eire, obstinately neutral, has been lucky or skillful enough to escape inundation by a German wave of destruction or invasion, but has had to endure severe wartime economic pressures. It is partly to cope with such problems that expansion of crop acreage and output, already strongly under way before the war, has been persistently accelerated in the past four years. The wheat area, which had fallen to a low of 21,000 acres in 1931 and 1932, had been enlarged to 255,000 in 1939, and rose to 575,000 in 1942.[1] With yields in some war years exceeding prewar averages of 34–35 bushels per acre, and compulsorily high rates of milling extraction, Eire has radically reduced the extent of her dependence on wheat and flour imports. It is not yet clear to us whether the goal of 650,000 acres for 1943 was reached, but the indications are that the crop will be so large that after it becomes freely available very small imports of wheat or flour will be required unless milling restrictions are relaxed.

In Great Britain, the wheat acreage in 1942 was 135.6 per cent of the prewar acreage (exact year or years not officially disclosed), and the 1943 acreage more than 25 per cent above that of 1942.[2] Though official data on acreage and production are not published, this

[21] *Commercial Intelligence Journal*, Aug. 28, 1943, p. 166.

[22] *Monthly Review of the Wheat Situation*, Aug. 20, 1943, p. 7; Wheat Studies, April 1940, XVI, 361–62.

[23] Flour output in July–June 1942–43 is provisionally put at 1,053,089 tons, 74 per cent of the record output of 1940–41. *Monthly Summary of the Wheat Situation in Australia* (Commonwealth Bureau of Census and Statistics), June 1943, p. 5. This issue (the first to be released in about a year) contains especially valuable data on many aspects of Australian wheat and flour developments during the war years.

[1] Mary E. Long, "Eire's Wartime Agriculture," *Foreign Agriculture* (U.S. Dept. Agr.), July 1943, VII, 160–68.

[2] *Agriculture, The Journal of the Ministry of Agriculture* (Great Britain Ministry of Agriculture and Fisheries), August 1943, L, 217–18. The basic price of millable wheat is 14*s.* 6*d.* per cwt., or $1.57 per bushel, in August 1943, rising to 16*s.* 2*d.* in June 1944. *Corn Trade News*, Aug. 4, 1943, p. 290.

year's wheat acreage probably exceeded 3 million acres; and we guesstimate the 1943 harvest at 105–125 million bushels, compared with a 1935–39 average of 62.4 million.[3] Present indications are that the British wheat acreage will be at least maintained in 1944.

Before the war something like 25–50 per cent of the domestic crop was fed to livestock, chiefly poultry.[4] Now, almost none is permitted to be so used. In proportions not known for generations, homegrown wheat is now going into British bread.[5] Even this year, however, something over half of the flour consumed will be British-milled imported wheat plus limited amounts of imported flour. From September 20, British millers are to use 40 per cent native wheat in their grist.

British consumption of flour and bread, which have not been rationed, rose substantially in the first three years of the war. Wheat consumption for food, though held up by increasing numbers of armed forces within the country, has undoubtedly been reduced since the spring of 1942 through resort to higher rates of extraction (about 85 per cent), dilution of flour with small amounts of oat, barley, rye, and potato products, and striking expansion of potato consumption brought about by price differentials and intelligent publicity campaigns.

In the absence of official data on imports and utilization, we estimate Britain's requirements for consumption of imported wheat in 1943–44 at 140–150 million bushels, as compared with average imports of 206 million in 1934–39. Net imports of wheat and flour (allowing for shipments to armed forces outside the islands and some for relief of liberated areas) may be considerably less than this if conditions warrant drawing upon reserve stocks, which are officially admitted to be large.[6]

Armed forces in Great Britain, as well as the civilian population there, eat the standard flour and bread adopted in the spring of 1942, modified by further diluents during 1942–43. In the early months of the crop year, up to 25 per cent of the flour used in specific lots of bread and pastry was permitted to be white flour, of which 12½ per cent could be added by millers and another 12½ per cent by bakers. From February 22, 1943, allocations of white flour were made only to millers, who were required to add this flour to their own mill mixes. The amounts so allocated have varied with the white-flour-stocks position. Apparently the percentage was as low as 7½ per cent in March–April, and again from September 1, while in the interim it was as high as 10 or 12½ per cent. Most of the white flour so used is older-milled Canadian flour.

British and Dominions armed forces outside the British Isles, however, eat white flour. Since British millers are not permitted to produce white flour, most of this is Canadian-milled, which keeps longer than the standard British flour. Substantial stocks of white flour undoubtedly exist both in Britain and in overseas bases. Though uninformed of their size and distribution, we deem it reasonable to assume that such reserves have been and will be built up and maintained not merely for use of the armed forces, but for considerable emergency feeding in Continental areas following their liberation.[7]

Until the Allied invasion of French North Africa the Axis powers drew upon the grain supplies of Morocco, Algeria, and Tunis (p. 20), leaving comparatively limited quantities for the population of this area until the 1943 harvest. After the invasion, some flour was shipped in to relieve the tightness. We doubt if the combined wheat crop of the three countries reached 3 million tons, as suggested by one report, but the surplus may easily amount

[3] Of collateral interest is an official statement covering all agricultural products, based on 1942 data: "The estimated increase in the net output from soil of United Kingdom is 70 per cent. over pre-war." This "is measured in calories, and is a *net* figure. . . . . That part of the output derived from imported feedingstuffs is excluded." *Agriculture, op. cit.*, p. 218. We infer that the 1943 figure will be appreciably higher.

[4] Cf. WHEAT STUDIES, June 1932, IX, 346–47.

[5] In the House of Commons on July 28 Minister of Agriculture Hudson "revealed that the amount of home-produced cereals used in our loaf in 1942–43 showed an increase of no less than 52 per cent. over 1941–42." *Corn Trade News*, Aug. 4, 1943, p. 288.

[6] Lord Woolton, Minister of Food, was so quoted in *New York Times*, Aug. 28, 1943, p. 2.

[7] We hold this view despite what might appear to be an official contradiction by Sir John Anderson (Lord President of the Council). *New York Times*, Aug. 10, 1943, p. 5.

to 15–20 million bushels. This year North African surpluses will presumably be purchased in part by the military authorities for current and prospective use, and in larger part by the North African Economic Board as stockpiles for military and relief disposition in the Mediterranean area as developments demand or permit.[8]

In Egypt the wheat acreage was of record size and the 1943 crop apparently exceeds customary domestic utilization. Turkey, which suffered from wheat shortage last year, had excellent harvests. There are similar reports from other countries of the Middle East. South Africa's last wheat crop of 18.5 million bushels was second only to the huge crop of 1935.[9]

India's food problems have been especially acute since the Japanese conquest of Burma cut off that source of India's important rice imports. Imports of more than 7 million bushels of wheat were secured during the winter—presumably from Australia; and exports of food grains have been cut down to negligible quantities.[10] In the past year, stimulated by a "Grow More Food" campaign, the area in food grains was increased by over 8 million acres. Though little of the expansion was put into wheat, this year's wheat crop, now estimated at 410 million bushels, is of record size. Many of the food difficulties have been attributed to defects of management of supplies rather than to shortages per se, and in mid-April the food-supply position itself was officially considered relatively favorable.[11]

[8] Table I; *New York Times*, Aug. 13, 1943, p. 8; and *Department of State Bulletin*, Aug. 14, 1943, p. 97.

[9] *Corn Trade News*, Aug. 18, 1943, p. 315, and WHEAT STUDIES, December 1940, XVII, 202.

[10] *Corn Trade News*, Aug. 18, 1943, p. 315.

[11] See report of a broadcast from Delhi on Apr. 16, 1943, by Maj. Gen. E. Wood of the Food Department, in the official *Indian Information*, May 1, 1943, XII, 391–92.

[12] *London Grain, Seed and Oil Reporter*, Aug. 12, 1943, p. 151; *New York Times*, Aug. 25, 1943, p. 4; and reports extending through September.

[13] The British Ministry of Economic Warfare is said to have stated recently that grain production in the Ukraine under German occupation "was far below expectations and barely sufficient for the population." "Wheat Market Review" (Federal-State Market News Service, San Francisco), Sept. 11, 1943. See also *New York Times*, Sept. 9, 1943, p. 22.

Latterly, however, Bengal has faced extreme distress,[12] pending the autumn harvests. Although rice is the staple food of its people, famine relief will make heavier demands on supplies of wheat and lesser grains.

During the past crop year the USSR has received shipments of wheat and flour on credit from Canada, on lend-lease account from the United States, and perhaps from elsewhere. The total was probably not over 20 million bushels in terms of wheat. Competition of munitions, fats, and other foods for limited shipping space, the hazards of ocean shipment (especially via Murmansk and Archangel, but including those via the Middle East and Vladivostok), and land transport difficulties which affected both imports and their internal distribution, undoubtedly combined to keep imports well below requirements on the basis of need.

The Russian bread-grain crops of 1943 were planted on an area larger by perhaps 16 million acres than those of 1942. They were seriously menaced by the moisture deficiencies of last autumn and droughts in the spring, but rains came in time to raise hopes of an average crop in the area controlled by the USSR during the fall and winter. Much less can be expected in the wide areas retaken in the past six months, or in those that will yet be reconquered before the next harvest.[13] Though for several months foodstuffs have been given priority equal to (or even exceeding) tanks and planes in Russian lend-lease requests, the volume of wheat and flour shipped thither has continued much below computed Russian requirements or the wheat supplies that could have been spared in North America.

As reconquest of Nazi-held areas of the USSR continues, food requirements of the liberated areas must be expected to rise, despite the fact that much of this area normally yields a surplus. But the physical barriers to provisioning them seem likely to continue serious, especially until reopening of the Dardanelles permits importation by that naturally easiest route. The volume of wheat and flour imports by the USSR will be limited mainly by transportation bottlenecks, not determined by calculated needs or by supplies available

overseas. Under the most favorable conditions for shipment, 150 million bushels of wheat might conceivably be taken, but the actual figure seems unlikely to reach 100 million bushels.

Important sections of China have suffered from famine during the past year, as so often before, and extreme inflation has complicated the embattled nation's food difficulties. Recent reports of this year's crops are favorable.[14] In any event, there is no present prospect that overseas foodstuffs can be shipped to China or Pacific areas in Japanese hands.

Continental Europe

In the five crop years before the present war, the wheat crop of Continental Europe ex-Russia averaged 1,529 million bushels, and annual utilization of wheat averaged 1,653 million (Table XII). In the past three war years annual utilization has been much lower, chiefly because crops and imports have both been much smaller; but our best guesstimates, given in Table II, must be taken as such. Nevertheless, imports have been received each year from North Africa, and into Spain, Portugal, Sweden, Switzerland, and Greece from overseas; and emergency reserves at the outbreak of war were high enough to be drawn upon. We infer that human consumption of corn, barley, oats, and potatoes was larger in 1942–43 than in any previous year of the present war.

Carryovers of bread grain in Continental Europe have certainly been much reduced during the war, presumably to subnormal levels, but they cannot have been exhausted before this year's harvests. They were presumably largely in Germany and in peasants' hoards elsewhere. The Germans have appeared confident of drawing considerable amounts of grain from the Ukraine this season. We have no reliable basis for estimating the amount they will actually get, but it will depend on other factors besides the size of the surplus, or the lack of it, in the areas under Nazi control at or after harvest.

Continental European wheat acreage in 1943 was larger than in 1942, though presumably still below the prewar average because of subnormal plantings in the Balkans, Spain, and France. Accumulating evidence tends to bear out persistent predictions that this year's wheat crop ex-Russia will be the largest since 1939. Though probably not up to earlier expectations, the aggregate outturn may exceed 1,400 million bushels.

Information on the German crops is very favorable.[1] While Germany retains mastery over most of the Continent, moreover, she can supplement her own production by drafts on countries in her power. Indeed, the extent of her actual drafts seems likely to exert great influence upon the volume of relief required in areas that are gradually liberated.

The Danube countries harvested much larger crops this year than last. Fall planting of wheat was not checked in 1942, as it had been the previous year, by early onset of cold weather; and the mild winter of 1942–43 resulted in less than average winterkilling as contrasted with heavy winter damage in 1941–42. Drought persistently threatened the Danube crops, but apparently affected wheat yields only moderately.

An exceptionally severe drought of two months' duration cut Portugal's crops, and parts of Spain and southern France suffered from the same cause. Portugal is fortunately in a position to take larger commercial imports of wheat from Canada, but her general food position has sharply deteriorated in recent months. Spain, during the war an important market for Argentine wheat, had expected a good wheat crop despite local failures, but latest reports are that it will be only moderately larger than in 1942. Despite late damage, France is apparently among the countries expecting a somewhat larger production than last year. Before the invasion of Sicily began, Italy had harvested a wheat crop, with good yields on enlarged acreage,

[14] *New York Times*, Sept. 2, 1943, p. 3.

[1] Earlier and later reports do not bear out a pessimistic official one summarized in the *London Grain, Seed and Oil Reporter*, Aug. 12, 1943, p. 151:

"In a report by the German Ministry of Agriculture it has been revealed that only 9,000,000 tons of Wheat will be available this year for domestic consumption (against 11,000,000 tons required) in consequence of a bad harvest. It was added that the Potato harvest is 25 per cent. smaller than last year and foreshadows a drastic reduction of food rations this Autumn."

probably above the prewar average[2] and not far below Italy's prewar average consumption for food and seed.

Multifarious modifications have been made in European bread-grain consumption, such as resort to high extraction, admixtures with other cereals and potatoes, and increased consumption of corn and potatoes as such. These economizing devices are likely to be retained, in changing forms and degrees, while hostilities continue and for some time thereafter. In all of the Danube countries bread rations have recently been increased, or restrictions on wheat sales relaxed. Further steps of this kind are to be expected there and elsewhere on the Continent, as the crops are gathered in. But the increased bread-grain supplies of the current year will probably be mainly employed to release from flour milling substantial amounts of feed grain that had to be drawn on heavily for flour in 1942–43. The feed grains so released will be used to check the wartime decline of livestock and to bring about, if possible, some increases in pig and cattle numbers.

In Nazi-dominated countries there is unquestionably much malnutrition and undernourishment; and some of it, especially in urban areas, amounts to what may be loosely termed "semistarvation." From time to time there has been some outright starvation in restricted areas, as in Greece and Polish cities, and among restricted groups elsewhere. Much of this has been attributable to ruthless Nazi measures affecting special groups or whole populations.[3] In addition, various degrees of food privation are common in Continental Europe, but so they are in the United Kingdom, where the level of nutrition has nevertheless been well maintained during the war years. Of the present extent of numerous forms of destitution — which involve housing, fuel, clothing, and soap as well as food—there are no reliable statistical measures. Nor is it possible to make more than highly provisional estimates of the quantities of food that will be necessary to move in, as the United Nations enlarge their present slight hold on the Continent. We return to this subject below.

During 1942–43 Continental European countries imported limited quantities of overseas wheat, probably more than in 1941–42. Spain was the largest importer, drawing wheat from Argentina under bilateral agreements. Sweden and Switzerland got a few cargoes through by permission of the blockading belligerents, but most of the Swedish tonnage was tied up until late in the crop year. Portugal imported several million bushels from Canada. Since August 1942 donated Canadian wheat at the rate of about 550,000 bushels per month has been arriving in Greece to relieve her most pressing needs.[4] In addition, before the invasion of French North Africa, considerable amounts were shipped from that surplus area into France; but in the crop year as a whole French imports were probably considerably less than in any of the three preceding years.

Enlargement of both commercial and relief importations is already in prospect for 1943–44. Portugal, with a very short crop because of drought, will draw much more heavily from Canada. Sweden is already importing from Argentina, but will probably not take much wheat.[5] When the liberation of Italy has been achieved, shipping conditions permitting, Switzerland can be expected to import considerably more than has been possible hitherto, from Argentina and from Canada. Even earlier, some relief shipments into Italy will be made. At least one wheat cargo has already been reported landed at Salerno, and more are presumably following.

As soon as it becomes feasible to send wheat into the Netherlands and Belgium, these two countries can expect relief supplies already purchased or contracted for by their governments in exile. The same may be true of Denmark and Norway, and possibly France as well. All these countries rank high on the

[2] According to analyses of the Office of Foreign Agricultural Relations. U.S. Dept. Agr., Press Release 581-44, Sept. 15, 1943. The figure suggested was 280 million bushels, compared with unofficial estimates of 268 million bushels from 13 million acres in 1942. Cf. also Table XII.

[3] See two valuable items in *New York Times*, Aug. 27, 1943, p. 7.

[4] WHEAT STUDIES, September 1942, XIX, 17.

[5] Valuable for background, with some information on 1942–43, is a recent article: Ewert Aberg, "Sweden Looks to Its Agriculture," *Scientific Monthly* (Washington, D.C.), September 1943, LVII, 230–39.

lists of prospective recipients of United Nations relief food. Relief shipments to Greece under the arrangement adopted last summer will presumably continue until her liberation is effected, when the quantities will presumably be increased considerably.

Nutritional Developments

In Continental Europe and Eire, wartime scarcity of bread grains has led to general resort to high extraction rates. The resulting flour and bread are darker and commonly regarded as less palatable than the whiter products customarily consumed in peacetime, but they have the nutritional advantage of retaining higher content of several vitamins and minerals.

In the United Kingdom, nutritional research and technology have combined to produce, under government pressure, types of standard flour and bread which are more acceptable than darker, higher-extraction products and yet have roughly equivalent nutritional virtues. Similar efforts in Canada have yielded "Canada Approved" products, which have as yet made only limited headway in open competition with white flour and bread. The Canadian policy even prohibits the sort of measures that have become official policy south of the border.

In the United States, where as in Canada wheat scarcity did not enter as a factor, the policy has been to promote "enrichment" of white flour and bread by milling and baking procedures designed to insure the presence, in the final products, of enlarged quantities of iron and certain vitamins in which the diets of large groups of the population are deemed deficient, but without significantly affecting appearance, flavor, or consumer acceptability. This movement has been intelligently pushed by co-operative action of nutrition experts, government specialists, and the milling and baking industry, under the guidance of what is now called the Food and Nutrition Board of the National Research Council. Corresponding efforts with respect to corn meal and rice are in an earlier stage.[1]

Federal standards for enriched flour, fixed and enforceable by the Federal Security Agency (Food and Drug Administration), were announced in May 1941 and went into effect on January 1, 1942. Revised standards are now to become effective October 1, 1943. Corresponding standards for enriched bread were considered at formal hearings in April 1943, and proposed on August 3,[2] but have not yet been promulgated. Under Food Distribution Order No. 1, however, equivalents of the older FSA standards for flour became effective on January 18, 1942, when the order required all white bread to be enriched. Equivalents of the revised flour standards also become effective for bread on October 1, 1943.

Old and New Standards for Enrichment of Flour and Bread

(Milligrams per pound, except U.S.P. units for vitamin D; parentheses indicate optional ingredients)

Ingredient	Enriched flour[a]		Enriched bread[b]	
	Effective 1-1-42	Effective 10-1-43	Effective 1-18-43	Effective 10-1-43
Thiamin ..	1.66–2.50	2.0–2.5	1.0–2.0	1.1–1.8
Riboflavin.	(1.2–1.8)	1.2–1.5	(0.8–1.6)	0.7–1.6
Niacin	6–24	16.0–20.0	4.0–8.0	10.0–15.0
Iron	6–24	13.0–16.5	4.0–16.0	8.0–12.5
Calcium ..	(500–2000)	(500–625)	(300–1200)	(300–800)
Vitamin D.	(250–1000)	(250–1000)	(150–600)	(150–750)

[a] Including enriched bromated and enriched self-rising flour, except that for the latter, from Oct. 1, 1943, calcium is a required ingredient with limits of 500–1500 mg. per pound.

[b] Equivalents of currently established standards for enriched flour made compulsorily applicable to bread under Food Distribution Order No. 1.

The accompanying table shows the old and new standards compared. Until now, riboflavin has been an optional ingredient in flour, because supplies of this vitamin had been inadequate to permit making its inclusion mandatory. The new flour standards raise the minimum for thiamin moderately and those for niacin (nicotinic acid) and iron considerably, as compared with those previously in effect, and generally narrow the ranges by reducing the upper limits hitherto in force.

Since February 1942, army and navy purchases of bread flour have been exclusively

[1] A South Carolina statute requiring enrichment of corn meal and grits went into effect on July 1, 1943, as flour enrichment had become mandatory in that state Aug. 1, 1942.

[2] Cf. *Federal Register*, Mar. 19, 1943, pp. 3378–79, and Aug. 3, 1943, pp. 10780–88; *Northwestern Miller*, Mar. 24, 1943, p. 9, and Aug. 11, 1943, p. 12.

enriched flour.[3] During 1942, chiefly by voluntary action under official encouragement, the enrichment of "family flour" and commercially baked bread was stepped up to something like three-fourths of the total output. The War Food Administration is expected shortly to make enrichment of family flour mandatory, with the full approval of the milling industry. Its order may go further, but the official proposal to require all flour to be enriched at the mill has been vigorously—and in our judgment soundly—opposed by the baking industry, since enrichment of bakery bread is more commonly and more cheaply effected by methods other than use of enriched flour, such as direct application of enriching ingredients to the dough and use of special yeasts. Meanwhile, however, Alabama and Texas have passed state laws, effective October 1 and 10 respectively, requiring all flour sold in those states to be enriched. South Carolina and Louisiana had previously taken similar action.

Costs of enriching processes and ingredients have been gradually reduced with experience and increased volume, and are now comparatively small. On enriched flour, the OPA has allowed a maximum price differential of 10 cents per 100 pounds. Effective October 1, this differential is raised to 17 cents since, under the new standards, reductions in costs of some ingredients are more than offset by increased minimum quantities and the mandatory inclusion of riboflavin.[4]

An important problem of wartime food management is how to make acceptable use of products that are both abundant and nutritious. The best example is soybean flour, now almost a byproduct of crushing soybeans for oil. An excellent foodstuff, valued for its proteins, which are complementary to those of wheat flour, it is now exceptionally abundant because of notable expansion of United States production. Yet neither here nor in Europe is it an established item in the diet. If soybean flour ever becomes such, it will probably be as an ingredient in established foods—for example, in limited proportions in macaroni, bakery products, sausages, soup mixes, etc. To the extent that soybean flour (especially low-fat flour as compared with full-fat) and certain peanut products can be made acceptable to consumers, here and in relief areas, they will reduce the nutritional needs for animal proteins, which are relatively scarce and far more costly to produce.[5]

In the United States such utilization of soybean flour is rendered difficult by official standards established to protect the public against adulterations. Soybean bread, containing a high percentage of soybean flour, can be produced and sold if properly labeled, but there is no need for pushing it here and no prospect that it will ever sell in large volume.[6] Introduction of 5, 10, or 15 per cent of soybean flour into wheat flour or sausages would not encounter the same consumer obstacles but is illegal under standards set up under the Food, Drug, and Cosmetics Act. Conceivably these might be set aside, during the period of war food stringency, by order of the WFA. Except by some such relaxation, we see no prospect that the American public will absorb the large quantities of soybean flour provisionally allocated for civilian consumption. The legal obstacles do not apply to products for lend-lease or relief use, where the problem is merely the complicated one of putting the soybean flour into mixtures that will be eaten.

Relief and Related Policies

Until early in 1943, the wartime wheat problem seemed to be the dual one of coping with extremely burdensome surpluses in the four chief exporting countries and more or less severe shortages eleswhere. Blockades and shipping stringency persistently prevented the obvious solution. Efforts were therefore made

[3] Wheat Studies, May 1942, XVIII, 352; *Northwestern Miller* (Almanack Number), Apr. 28, 1943, p. 46.

[4] *Southwestern Miller*, Sept. 28, 1943, p. 28.

[5] Important researches on proteins now under way are beginning to yield results considerably at variance with earlier views, among other things on nutritional requirements for animal proteins. These have important bearings on estimates of the agricultural impacts of the ambitious goal of optimum nutrition for all the world's people.

[6] Like other specialty breads, it has an appeal to consumers that seems likely to prove limited and narrow, in contrast to staple white bread. Soybean flour may conceivably come to have wider uses in the household, but probably in moderate volume.

to restrict wheat acreage and production in the exporting countries and to increase it elsewhere, employing price supports and subsidies in both sorts of areas for different reasons. Not until 1942 were special measures taken, in the United States, Canada, and Australia, to stimulate utilization of surplus wheat for feed use and alcohol manufacture. Meanwhile, under other stimuli arising from domestic and export demands, livestock populations in the wheat-exporting countries increased apace. Also, as coal became increasingly short in Argentina, maize was extensively pushed into fuel use there.

Then followed, in 1943, the Argentine drought and failure of the maize crop, feed shortages despite unprecedented supplies in the United States, surprising increases in feed use of wheat in North America, Argentina's decision to divert wheat to fuel and feed on a substantial scale, assurance of smaller 1943 wheat crops in North America, and prospects that heavier lend-lease and relief shipments to Soviet Russia and to Europe will be feasible. Naturally the questions arose: Will the huge wheat surpluses melt away as the Argentine maize surplus did, and so much be diverted to feed, alcohol, and fuel that reserves for relief disposition will be inadequate? Is there danger that wheat utilization for nonfood uses will even go so far as later to jeopardize food supplies in the exporting countries if extensive crop failures occur in 1944?

In addition to government agencies in the various countries, at least four international agencies are potentially concerned with these issues. These are: (1) the Combined Food Board, set up in June 1942 and still primarily an Anglo-American body; (2) the five-country International Wheat Council, organized in August 1942; (3) the Interim Commission set up on July 15 in accordance with recommendations of the United Nations Conference on Food and Agriculture; and (4) the United Nations Relief and Rehabilitation Administration, which now is expected to be set up under a revised draft agreement planned for signature early in November.[1] The newest of these international agencies will surely be concerned with the matters here discussed. Preparation for its important decisions will presumably continue to go forward pending its formal birth, the initial meeting of its policy-making Council, and the functioning of its Central Committee and Director General.

The relief and rehabilitation tasks that face the United Nations, before and after victory is achieved, are unquestionably large. Though successive attempts at appraisals and forecast have been made, and should continue to be made, all are necessarily provisional. Yet enough is known to facilitate the organized planning that is essential to doing the job as well as possible.

In various efforts to arouse people to the importance of the task of food relief, its magnitude has been termed "appalling," even by Governor Lehman. His valuable article in the September *American* was headed "Can We Let Them Starve?" This title does not well fit his sane, well-based presentation, but it tends to strengthen an impression that scores or hundreds of millions in Continental Europe are literally starving now and are steadily becoming worse off. If this were true, it would call for radical changes in the food policies of the United States and Canada, and in other policies of the United Nations: among other things, drastically to curtail nonfood uses of wheat, corn, and soybeans, and production and consumption of animal products, in order to be able to ship to Europe the maximum possible starvation-preventing grains.[2]

Our own analysis (p. 20), based on much concordant evidence, leads us to believe the "starvation" notion so exaggerated as to be essentially false. In the past two years, deaths by starvation in Continental Europe have certainly been fewer than in China, and probably fewer than in two other populous members of the United Nations—India and Soviet Russia; and many of the deaths in Europe were due to deliberate Nazi oppression. Current European crops are such that over large areas of the

[1] See especially *Department of State Bulletin*, July 14, 1942, pp. 582–94; Aug. 8, 1942, p. 689; Jan. 16, 1943, p. 67; June 12, 1943, pp. 523–27; July 17, 1943, pp. 33–38; Sept. 25, 1943, pp. 211–16; and J. S. Davis, "New International Wheat Agreements," WHEAT STUDIES, November 1942, XIX, 25–84, esp. pp. 32–34, 72.

[2] Cf. F. A. Harper and E. A. Hyer, "How Much of the World Can We Feed?" *Farm Economics* (Cornell Univ., Ithaca, N.Y.), June 1943, pp. 3470–73.

Continent the food position should be better, not worse, than last year.

Relief and rehabilitation tasks now call for strenuous, concerted efforts to have well-constituted reserves of food to follow the advancing armies until after complete victory is won, and to clinch the victory itself. In amount and composition, these reserves should be adequate to supplement local supplies so as to cover urgent needs of liberated or conquered peoples. Quantities are needed to prevent not only starvation but semistarvation,[3] and also to correct the more serious forms of malnutrition; but plans for wartime food relief should aim at modest levels of nutrition and diet. So far as we can now judge, the practical task calls for well-considered modifications in production, utilization, and allocation programs, some cutback in overexpanded livestock inventories, and additional restraints on consumption in some well-fed countries. But it does not threaten the necessity for really drastic reductions in feeding of grain to poultry, hogs, and beef cattle, some products of which are desirable components in reserves for relief disposition.

Adequate reserves of wheat for food must be termed imperative. In the relief of food shortages in Continental Europe, before and after the cessation of hostilities, wheat and flour will loom largest, as they did during and after World War I.[4] Advances in nutritional science and the greater abundance of soybeans and dried legumes will influence the composition of food-relief supplies. Yet wheat is so basic a foodstuff, and wheat supplies are so much more abundant than in 1918–19, that it will again rank at the top of the program. As the previous experience demonstrates, relief in a narrow sense merges into relief in the broadest sense, including aid to Soviet Russia and eventually enlarged supplies to neutrals. It must therefore be viewed in the light of the entire international wheat position.

Two dangers must be avoided, if at all possible, in arriving at estimates of adequate reserves. Significant overestimation of supplies or significant underestimation of prospective utilization, if influential in determining policies, can lead to severe pinching on priority needs when this would be certainly embarrassing and possibly serious. Wheat must be kept abundant for liberal human consumption during the war and after, without threat of rationing or restricting its use for food, in the exporting countries at least. On the other hand, undue conservatism in estimation, backed by policy decisions, can lead to excessive reserves of wheat at the expense of production of animal products while the need for these is very pressing, and to postwar embarrassment and price collapse due to burdensome stocks of wheat when urgent need for it has passed. The relative promptness with which agricultural surplus followed scarcity after World War I emphasizes the importance of avoiding this horn of the dilemma. A middle ground must be sought.

Food-relief requirements in French North Africa proved limited and temporary, and this area has surpluses to spare for military and relief uses in Mediterranean Europe (p. 18). We infer that the experience will be broadly similar in Sicily, if not in Sardinia and Corsica.

Italy proper will present relief and rehabilitation problems as fast as the country comes under United Nations control, but at present it seems likely that in-shipments of wheat, flour, or other foodstuffs will not loom large in the total problem.[5] With as good a crop as that now indicated (p. 20), Italy has usually imported little wheat until late in the crop year. Flour-milling capacity is large enough to stand considerable destruction without becoming insufficient.[6] Relief foods, including flour, will doubtless be required for a time

[3] In our view, relief plans can and should be made to raise the level of total daily per capita calorie supply in liberated areas above the 2,000 calories that has been frequently mentioned in official statements as a minimum objective, except as shipping conditions and military decisions may necessitate keeping close to the minimum.

[4] For a summary view of the earlier experience, based on voluminous, detailed, but not altogether satisfactory literature, see a recent pamphlet by the League of Nations, Economic, Financial, and Transit Department, *Relief Deliveries and Relief Loans, 1919–1923*, 1943. II. A. 1 (Princeton, N.J., 1943).

[5] A useful recent article is P. M. Copp, "Italy's Food —in War and Peace," *Foreign Commerce Weekly* (U.S. Dept. Comm.), Aug. 28, 1943, pp. 3–5, 28.

[6] Italy, though a net importer of wheat, was in peacetime one of the largest net exporters of flour. Cf. WHEAT STUDIES, December 1939, XVI, 196.

because of local scarcities, destruction of transport facilities, and disturbance of interregional movement, rather than because of deficits in the country as a whole. Prior to September, the livestock population had not been much reduced, and some classes were even reported increased; but it can doubtless be rendered more productive as soon as additional feedstuffs can be imported. Italy has been exporting various foodstuffs to Germany. Her deficits in vegetable oils, meats, fish, and eggs, compared with peacetime averages, may have to be endured.

The grain position in the Danube countries will depend greatly on the time and manner of their change of status, and the extent to which Germany may have succeeded in drawing off their surpluses. For the present it is significant that good crops appear to be the rule in southeastern Europe, and that Rumanian grain harvests are considered the best since 1939. It is fair to expect that, in the months ahead, grain will move from these countries to Central Europe, even if many of the city people go hungry; but no one can safely predict when, whither, or how much grain will move, or what effects might follow extensive warfare in this region.

Prospective relief requirements for the occupied countries of western Europe loom much larger.

If victory should be won in Europe before the end of July 1944, if food-relief requirements should reach their peak before another harvest, and if shipping should permit full shipments, we consider that the maximum draft on United Nations present supplies of wheat for shipment to Continental Europe ex-Russia in 1943–44 would not exceed 300 million bushels and would probably be less than 250 million. On the basis of our present appraisal of Continental European wheat production in 1943, and barring heavy losses through destruction, current crops plus 250 million bushels of relief wheat and commercial imports by neutrals[7] at the same level as in 1942–43 would raise aggregate wheat consumption in 1943–44 to the prewar average and permit some replenishment of stocks. If progress with invasion should be made but victory be deferred, we are not able to arrive at figures higher than 250–300 million bushels for the year 1943–44 on any reasonable assumptions regarding the rate of liberation, destruction of food stocks in the process, and the extent of German withdrawals of foodstuffs before retreating. Requirements for imported supplies in 1944–45 may be considerably higher, but certainly not twice as large. The actual amount will depend on many factors, chief among which will be the European food crops of 1944.

The largest single block of territory and population requiring extensive relief may prove to be the portions of Soviet Russia that were in Axis hands until the 1943 harvest and have since been or will be won back. Presumably the USSR will draw on lend-lease or similar supplies to supplement her own resources for relief and rehabilitation of these people. Though we have no means of estimating either needs or effective requirements for this purpose, we expect the USSR to take less than 150 million bushels of wheat for this and other purposes in the coming year, even on optimistic assumptions as to moving the wheat in; and we doubt if as much as 100 million bushels will be so absorbed.

We believe it reasonable to assume that no important shipments of relief wheat to eastern or southeastern Asia will be feasible in 1943–44, and that Australian reserves will be more than ample to service armed forces in the Pacific in this period. But it seems clearly desirable United Nations policy to see that Australian reserves are kept large to provide subsequently feasible relief shipments to the Orient.

For relief and lend-lease disposition in Continental Europe plus Soviet Russia, therefore, we see little prospect that as much as 450 million bushels of imported wheat will be required in the coming year and at least as good prospect that the amount will be under 350 million, even if the war goes well for the United Nations. Other commercial imports into Europe, chiefly by neutrals, may reach 25–50 million additional. If such figures should be attained, shipments to the British Isles and non-European importers might raise

[7] Spain, Portugal, Switzerland, Sweden.

world net exports of wheat and flour to 750 million bushels, but they would be at least as likely to fall below 625 million.[8] At present we judge that the lower figure will not be reached in 1943–44, and that the higher one is altogether unlikely to be exceeded.

For commercial and relief shipments to Europe and the USSR, it would seem rational to rely most heavily on Canada for wheat and flour; to count on the United States and Australia for more limited shipments of flour; to depend on Argentina and French North Africa for limited shipments, chiefly of wheat, to parts of those areas; and to rely most heavily on Australia for any needed shipments to India, for supply of enlarged forces in the Pacific, and for eventual relief shipments to eastern and southeastern Asia. In addition, however, Great Britain can be expected, as soon as hostilities end on the Continent if not earlier, to release for prompt relief use most of her emergency stocks of flour, in addition to reserves specifically accumulated for this purpose (pp. 13, 17). Under the International Wheat Agreement she is committed to donate 25 million bushels for relief, or the equivalent in transportation.

The four chief exporting countries hold the bulk of the supplies potentially available for international disposal. Each of them faces urgent problems of allocation to reserves and nonfood disposition. Each is in danger of policy errors if it looks exclusively to its own position. Some measure of international collaboration on major decisions seems in prospect. Hence we present a composite table which may be useful in policy discussions. The figures in the upper half of the table are subject to revision with fuller knowledge, while those in the lower half are provisional illustrations of the usefulness of the form in which they are set.

The indicated domestic requirements include small absolute increases in both food and seed uses, the latter on the assumption that wheat acreages sown will generally be enlarged for 1944 harvests. The amounts set down for "limited feed use" and "conservative use for alcohol" are large except in comparison with 1942–43. Surplus wheat disposition for these two uses and for fuel in Argentina may this year raise their aggregate to or above the total used for food and seed in the four countries: items 17–19 total 824; items 4 and 5 total 835. Some such aggregate as indicated can be spared for these nonfood purposes, but it will be necessary to take steps, especially in the United States and Argentina, to prevent this extraordinary flow of wheat from going far higher. With good national management and suitable international collaboration, this should be feasible. It promises to entail some liquidation of swollen inventories of hogs, beef cattle, and probably also poultry in the United States; and already

TENTATIVE ANALYSIS OF WHEAT SUPPLIES AND DISPOSITION, 1943–44, IN FOUR CHIEF EXPORTING COUNTRIES

(Million bushels)

Item	United States	Canada	Australia	Argentina	Total
Supplies					
1. Total stocks, July 1/31, 1943	618	601	205	270	1,694
2. Crop of 1943	835	296	95	214	1,440
3. Total (excl. imports)	1,453	897	300	484	3,134
Disposition					
4. Food consumption	535	50	35	75	695
5. Seed use for 1944	80	27	10	23	140
6. Limited feed use	175	55	10	10	250
7. Conservative use for alcohol	60	10	5	..	75
8. Working stocks, July 1/31, 1944	125	45	50	70	290
9. Total above items	975	187	110	178	1,450
10. Balance	478	710	190	306	1,684
Other allocations					
11. Net exports, etc.	— 72	360	60	102	450
12. Relief donations	50	25	..	..	75
13. Other reserves	175	275	110	100	660
14. Surplus to feed	275	50	15	20	360
15. Surplus to alcohol	50	..	5	..	55
16. Surplus to fuel	..	..	..	84	84
Special subtotals					
17. Feed use (6+14)	450	105	25	30	610
18. Use for alcohol (7+15)	110	10	10	..	130
19. Fuel use	..	..	..	84	84
20. Total stocks, July 1/31, 1944 (8+13)	300	320	160	170	950

[8] In arriving at these figures, we take the algebraic sum of Canadian and United States figures, as in the table in the right-hand column.

some steps in these directions have been taken.[9] It also calls for special efforts to get coal shipped to Argentina. The obstacles to this lie partly in shortages for shipping and coal for export;[10] but they are in considerable measure diplomatic, since the new Argentine government has hardly gone beyond its predecessor toward joining the other American countries or the United Nations.[11]

Net exports in 1943–44, including shipments to armed forces, on lend-lease, and for relief, cannot be forecast with any approach to precision. We tentatively put the total at 525 (450 + 75) million bushels from these four countries, assuming that conditions will permit shipment of the relief donations already pledged. Probably this is optimistically high. But we count it desirable that wheat reserves (above ordinary working stocks) be kept relatively large in order to be surely prepared to meet heavier demands for Continental Europe and Soviet Russia (p. 25), and also to have adequate insurance against crop failures in 1944. The aggregate carryover of the four countries could, in our judgment, safely be allowed to fall well below the suggested figure of 950 million bushels if heavy relief shipments prove feasible in the current crop year. United States imports of wheat for feed use, chiefly from Canada, seem likely more or less to exceed out-shipments of United States wheat and flour for all purposes.

Granting the provisional character of our figures and discussion, we submit that the allocation tasks ahead are altogether manageable, provided time is taken by the forelock and the necessary integration of counsel and decision achieved. Fundamental policy decisions also need to cover financial arrangements and shipping priorities. Once basic policy issues are settled, the complicated details of specific arrangements can be handled as the specific conditions to be met unfold.

Collateral questions of importance are these: How much of the wheat for relief use, in earlier and later stages, should be shipped as grain, how much as flour, how much in other processed forms? In so far as flour is shipped, of what type should it be? No definitive answer can yet be given these questions, since considerations not now predictable will partially determine the practice. But the principles seem to us reasonably clear.

Broadly speaking, wheat rather than flour should be shipped wherever it can be effectively utilized in the receiving country. It costs less, is easier and cheaper to ship, handles and stores better. Milling imported wheat in the consuming country will yield byproducts needed for feed use, give desirable employment to manpower and equipment, and help in restoring earning power and morale. Such wheat can be milled according to prevailing local standards. For economic reasons, and perhaps nutritional ones as well, these should not be too quickly raised to or toward peacetime levels of palatability. Mills and transportation systems should be among the earliest objects of rehabilitation. Available supplies of varied types of export wheat should permit desirable allocations to destinations in line with known trade preferences.

Flour rather than wheat should be supplied for prompt relief in the earliest emergency stages, and where damage to or destruction of mills or transport facilities for a time prevents

[9] Steps to increase molasses imports for distillation are under way. The War Food Administration suspended quota limitations on livestock slaughter in September and October. This was officially explained as designed to stimulate early slaughter, partly to relieve the drain on the feed supply. Effective October 4, the OPA imposed its first price ceiling on livestock: $14.75 per 100 lbs. on live hogs at wholesale, Chicago basis. A few weeks earlier, the WFA announced that the "support price" on hogs in October–March 1944–45 would be $12.50 per 100 lbs. for hogs weighing 200–240 lbs., as compared with the floor price of $13.75 for hogs weighing up to 270 lbs. that has been in effect since Apr. 10, 1943. This reduction—to a level still very high compared with years prior to 1942 (except in 1917–19)—is designed to induce farmers to reduce the number of pigs saved next spring from the recent record peak of 74 million head to something like the 1942 level of 61 million.

[10] The British coal position has been very tight. Liberation of Italy will greatly enlarge her needs for coal from the United Nations to replace what she formerly secured from Germany. Destruction may sharply enlarge the requirements, net. United States coal production was curtailed by a strike in June. Both economies in use and expansion of production here may be necessary if increased shipments are to be made to Italy and Argentina.

[11] See the recent correspondence between the Secretary of State and the Argentine Foreign Minister, in *Department of State Bulletin*, Sept. 11, 1943, pp. 159–66; and a British Foreign Office statement issued Sept. 27, in *New York Times*, Sept. 27, 1943, p. 9.

effective utilization of wheat grain. On nutritional grounds some have urged the desirability of using for relief the British standard wheatmeal flour, so far as this can be shipped and used without great delay; and the British people might welcome larger admixtures of white flour in their loaf, to release more standard flour for relief disposition. Practical considerations, however, will probably dictate that the bulk of the flour shipped and stored overseas for relief will be white flour—Canadian, Australian, and American—of which the American will presumably be enriched to standards effective at the time of milling (p. 21). To economize shipping space and facilitate shipment, some of the flour will be compressed.[12] Wherever possible, white flour should be blended with local flour, to avoid prematurely adding to poor diets what would be regarded as a luxury product—white flour. To some extent at least, this practice was followed in French North Africa.

Demands for these purposes are presumably responsible for the recent stepping up of flour-mill output in Canada, Australia, and the United States, which may therefore reach peak levels as they did in 1918–20. But high policy should not permit flour to be pushed into areas where wheat can be advantageously utilized.[13]

Wheat products other than flour, and many food products containing wheat flour, will be included among the foods shipped for relief use. Intelligent efforts are being directed both toward utilizing abundant supplies of certain foodstuffs, and toward forms that relief consumers can be expected to use.[14] But the volume of wheat so used will presumably not bulk large.

What we regard as seriously inflated notions as to the size and duration of the food shortage continue to be voiced in some official and trade quarters. These notions stem partly from exaggerated ideas of the current and prospective calorie-food deficit in Continental Europe, partly from failure to recognize at their true value the surpluses of such foodstuffs that are now and potentially available, partly from underestimates of current European agriculture and its rate of postwar recovery, and partly from ideas, given wide currency by the United Nations Conference on Food and Agriculture, as to the heavy drafts upon agricultural productivity that raising the world level of nutrition will demand. One consequence is a disposition to hold reserves of wheat at very high levels, to expand its production overseas to insure this, to keep such production at wartime levels when it has been greatly expanded (as in the British Isles), and to encourage concentration on calorie foods in the early stages of agricultural rehabilitation in Continental Europe. The danger of these notions lies in the prospect that they may promote overexpansion and maldistribution of wheat production, and both delay and make more difficult the process of postwar readjustment.

The British Minister of Agriculture (Hudson) is conspicuous among those holding what we regard as ill-based views on these matters. Addressing the Council of Agriculture in London last June, he said:

> You may well ask me when our demands on you are going to cease or let up. Quite frankly, I cannot tell you—I should say not before 1947 at the earliest. Even if victory in Europe comes before then, the starving peoples of Europe must be fed.[15]

In expounding a four-year plan for British agriculture in the war-peace transition period, he said in the House of Commons on July 28:

> Our chief aims must be to maintain the high level of production we have already reached. . . . . The basis of our plan during the next four years must be to maintain our present production of food for direct human consumption, while at the same time taking steps to ensure that the fertility of our soil is not undermined, which necessarily involves also an increase in livestock and livestock products.[16]

The Lord Privy Seal (Cranborne) a little earlier said in the House of Lords that no

[12] On this new development, see *Northwestern Miller*, Nov. 25, 1942, p. 19, and July 14, 1943, p. 1a; *Southwestern Miller*, Sept. 7, 1943, p. 24.

[13] In the United States, at least, flour was overproduced in 1919–20, and was virtually dumped into relief channels. F. M. Surface, *The Grain Trade during the World War* (New York, 1928), pp. 415–19, 514.

[14] Cf. Helen S. Mitchell, "Planning Foods for Foreign Relief," *Northwestern Miller*, Sept. 15, 1943, pp. 22, 55.

[15] Quoted in *Pastoral Review* (Melbourne), Aug. 16, 1943, p. 581.

[16] *Economist* (London), July 31, 1943, p. 135.

immediate decisions on British agriculture were necessary because war conditions were likely to last till 1947.[17]

The first three parts of Recommendation XII of the United Nations Conference on Food and Agriculture read as follows:

1. That, as a first step in overcoming the general shortage of food, every effort should be made by countries whose agriculture can be expanded in the short-term period, so long as this is required and so far as the conditions of individual countries require or permit, to increase the acreage under crops for direct human consumption and even to hold back the rebuilding of depleted livestock herds—essential though this rebuilding will ultimately be—as well as the production of other crops which compete for acreage with essential foods;

2. That countries whose agriculture has been impaired should, in the immediate post-war period, utilize to the full their agricultural resources to bring about a rapid increase in food production, even if this involves a departure from the use of the resources which in the long run will be required, and even if it delays a return to production policies which are desirable for technical, economic, or nutritional reasons (for instance, in Europe there may need to be a concentration in the first years on vegetables, bread grains, and other products where production can mature quickly and which yield more calories per acre than livestock);

3. That, pursuant to the above purpose, countries which have been producing more than normal output because of freedom from enemy action should: (*a*) in the short run maintain such production; (*b*) whenever possible, increase production further, provided transport and the means of production, etc., are available, to assist in meeting abnormal demands.

In the light of the present outlook for relief requirements, wheat supplies, and ocean shipping, we seriously question the soundness of the positions thus taken. The issues urgently need further investigation soon, and continuous study in the light of changing conditions, not only by national governments in London, Washington, Ottawa, and elsewhere, but also by the International Wheat Council and the Interim Commission on Food and Agriculture.

[17] *Ibid.*, Aug. 7, 1943, p. 162.

This study is primarily the work of Joseph S. Davis, with the valued assistance of Rosamond H. Peirce and Elizabeth Brand Taylor, and of P. Stanley King on the charts. For reading of the manuscript in draft, and for essential help on specific points, the author is indebted to his colleagues M. K. Bennett, Karl Brandt, and Helen C. Farnsworth.

APPENDIX TABLES

TABLE I.—WHEAT PRODUCTION IN PRINCIPAL PRODUCING AREAS EX-RUSSIA, 1938–43*

(Million bushels)

Year	World ex-Russia[a]	Four chief exporters					British Isles	Continental Europe ex-Russia				French North Africa[d]	India	Others ex-Russia[a]
		Total	United States	Canada	Australia	Argentina		Total	Four neutrals[b]	Others ex-Danube	Lower Danube[c]			
1938.....	4,563	1,814	920	360	155	379	81	1,778	*149*	1,163	466	72	402	416
1939.....	4,195	1,603	741	521	210	131	72	1,621	162	1,008	451	100	372	*427*
1940.....	*3,920*	1,735	813	540	83	299	*75*	*1,225*	111	*819*	295	64	402	*419*
1941.....	*3,916*	1,649	943	315	167	224	*90*	*1,355*	139	*886*	*330*	*76*	374	*372*
1942.....	*4,109*	1,929	981	*557*[e]	156	235	*115*	*1,260*	*152*	*843*	*265*	*65*	375	*365*
1943.....	*3,850*	*1,440*	835	296	*95*	*214*	*135*	*1,400*	...	...	...	*75*	410	*390*
Average 1934–38.....	3,787	1,377	716	263	154	244	71	1,529	183	993	353	72	366	371

* Largely official data, for boundaries as in 1939; figures in italics represent or include in substantial part our approximations as of Sept. 30, 1943. Our estimates for 1943 are highly provisional.

[a] Excludes USSR, China, Iran, Iraq, Transjordania, and various small producers, but includes Brazil and Peru.

[b] Spain, Portugal, Switzerland, Sweden.

[c] Hungary, Yugoslavia, Rumania, Bulgaria.

[d] French Morocco, Algeria, Tunis.

[e] Below unrevised official estimate by 36.

TABLE II.—APPROXIMATE WORLD WHEAT SUPPLIES AND DISAPPEARANCE, ANNUALLY FROM 1938–39*

(Million bushels)

Year August–July	World ex-Russia					British Isles					Continental Europe ex-Russia				
	Initial stocks[a]	Crops	USSR exports	Total supplies	Disappearance	Initial stocks	Crops	Net imports	Total supplies	Utilization	Initial stocks	Crops	Net imports	Total supplies	Utilization
1938–39....	594	4,563	34	5,191	4,041	35	81	247	363	288	195	1,778	96	2,069	1,694
1939–40....	1,150	4,195	..[b]	5,345	3,945	75	72	240	387	287	375	1,621	118	2,114	1,694
1940–41....	1,400	3,920	8	5,328	3,778	100	75	245	420	295	420	1,225	60	1,705	1,455
1941–42....	1,550	3,916	..[b]	5,466	3,666	125	90	205	420	300	250	1,355	40	1,645	1,435
1942–43....	1,800	4,110	..[b]	5,910	3,860	120	115	180	415	290	210	1,260	40	1,510	1,345
1943–44....	2,025	3,850	..[b]	5,875	.....	125	135	...	...	...	165	1,400	...	.....	.....
Average 1934–39....	796	3,786	23	4,605	3,816	40	70	221	331	285	291	1,529	117	1,937	1,652

* Data as in WHEAT STUDIES, December 1942, XIX, 117, Table XXII, with recent revisions and preliminary approximations for 1942–43 and 1943–44.

[a] Excluding India and Japan, and otherwise less comprehensive than crop data.

[b] Net imports.

TABLE III.—UNITED STATES AND CANADIAN CARRYOVERS OF WHEAT, 1937–43*

(Million bushels)

Year	United States (July 1)						Canadian (July 31)						
	On farms	In country mills and elevators	In CCC steel and wooden bins	Commercial stocks	In city mills[a]	Total inc. U.S. grain in Canada	On farms	In country mills and elevators[b]	In terminal elevators	In transit	In flour mills[c]	Canadian grain in U.S.	Total
1937.....	22.0	11.8	...	9.0	40.4	83.3	4.0	7.4	17.7	2.8	1.0	4.1	37.0
1938.....	58.8	31.3	...	22.2	40.8	153.8	5.1	2.8	12.2	2.4	1.1	1.0	24.6
1939.....	88.0	36.8	...	64.1	61.1	250.6	4.7	13.9	70.1	4.8	1.1	8.3	102.9
1940.....	79.6	35.3	...	84.2	80.6	280.3	17.3	64.0	173.6	16.9	1.1	27.5	300.4
1941.....	86.8	73.8	...	142.7	81.6	385.1	14.0	224.4	187.6	21.1	1.2	31.8	480.1
1942.....	163.7	142.4	4.4	224.4	96.8	631.9	10.4	139.8	232.9	18.7	3.1	18.9	423.8
1943.....	190.0	102.4	59.0	162.2	104.4	618.0	197.2	232.1	137.3	16.5	3.1	15.3	601.5

* Latest official data of U.S. Department of Agriculture and Dominion Bureau of Statistics.

[a] Estimates of U.S. Department of Agriculture, based on stocks in city mills reported to the Census Bureau, raised to allow for stocks in non-reporting mills.

[b] Includes private terminal elevators and flour mills in Western Division.

[c] In Eastern Division only.

TABLE IV.—WHEAT SUPPLIES AND DISPOSITION IN FOUR CHIEF EXPORTING COUNTRIES, ANNUALLY FROM 1938–39*

(Million bushels)

Year	Domestic supplies			Domestic utilization				Surplus over domestic use		
	Initial stocks[a]	New crop	Total[b]	Milled (net)	Seed use	Balancing item[c]	Total	Total	Net exports[d]	Year-end stocks[a]
	A. UNITED STATES (JULY–JUNE)									
1938-39....	154	920	1,074	475	76	+163	714	360	109	251
1939-40....	251	741	992	472	73	+120	665	327	47	280
1940-41....	280	813	1,093	476	74	+124	674	419	34	385
1941-42....	385	943	1,328	480	62	+127	669	659	27[e]	632
1942-43....	632	981	1,613	524	62	+381	967	646	28[e]	618
1943-44[f]...	618	835	1,453	537[g]	80	+551	1,168	285	35	250
	B. CANADA (AUGUST–JULY)									
1938-39....	25	360	385	47	35	+42	124	261	158	103
1939-40....	103	521	624	49	36	+47	132	492	192	300
1940-41....	300	540	840	43	28	+58	129	711	231	480
1941-42....	480	315	795	46	27	+76	149	646	222	424
1942-43....	424	557[h]	981	50	22	+98	170	811	210[e]	601
1943-44[f]...	601	296	897	..	..	..	...	...	...	...
	C. AUSTRALIA (AUGUST–JULY)									
1938-39....	50	155	205	31	14	+14	59	146	96	50
1939-40....	50	210	260	33	13	− 2	44	216	86[e]	130
1940-41....	130	83	213	32	13	+ 8	53	160	90[e]	70
1941-42....	70	167	237	33	10	+14	57	180	35[e]	145
1942-43....	145	156	301	34	9	+18	61	240	35[e]	205
1943-44....	205	95[e]	300[e]	..	..	..	..	...	..	...
	D. ARGENTINA (AUGUST–JULY)									
1938-39....	72	379	451	74	21	+ 4	99	352	122	230
1939-40....	230	131	361	73	21	+13	107	254	179	75
1940-41....	75	299	374	73	22	+ 3	98	276	96	180
1941-42....	180	224	404	74	20	+ 7	101	303	83	220
1942-43....	220	235	455	74	20	+22	116	339	69	270
1943-44....	270	214[e]	484[e]	..	..	..	...	...	..	...
	E. FOUR CHIEF EXPORTERS									
1938-39....	301	1,814	2,115	627	146	+223	996	1,119	485	634
1939-40....	634	1,603	2,237	627	143	+178	948	1,289	504	785
1940-41....	785	1,735	2,520	624	137	+193	954	1,566	451	1,115
1941-42....	1,115	1,649	2,764	633	119	+224	976	1,788	367	1,421
1942-43....	1,421	1,929	3,350	682	113	+519	1,314	2,036	342	1,694
1943-44[e]...	1,694	1,440	3,134	...	...	...	...	....	...	....

* Based on official data so far as possible, including U.S. Dept. Agr. 1943 revisions for United States stocks and crops; see WHEAT STUDIES, December 1942, XIX, 118. On disposition in 1943–44, see also discussion on pp. 26–28.

[a] United States and Canadian grain in North America.

[b] Ignoring imports.

[c] Use for feed and alcohol, waste, and errors in other estimates.

[d] United States data adjusted for changes in stocks of U.S. wheat in Canada; Canadian exports as defined in Table VI, minus imports which are usually small.

[e] Our estimates or guesstimates.

[f] Official estimates standing on Sept. 30, 1943.

[g] Corresponding official estimates for preceding years are 6 to 14 million bushels higher than ours.

[h] See Table I, footnote *e*.

TABLE V.—UNITED STATES FLOUR PRODUCTION, MONTHLY FROM JULY 1938*

(Million units of 100 pounds)

Year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1938-39.....	17.7	19.0	20.2	20.0	18.4	17.5	17.6	16.1	18.6	17.1	17.7	17.5	217.4
1939-40.....	17.5	19.8	23.3	19.6	17.2	16.9	18.0	16.7	17.3	17.2	17.7	16.0	217.2
1940-41.....	17.7	18.5	19.3	20.7	18.2	17.0	18.3	16.8	18.2	18.7	17.9	17.8	219.1
1941-42.....	18.5	17.9	19.7	20.1	17.1	19.3	19.8	17.6	17.4	16.7	16.4	17.2	217.7
1942-43[a].....	18.9	18.6	20.4	21.8	19.8	21.1	22.9	20.3	22.0	18.6	16.3	17.4	238.1

* Estimates of total United States flour production, by Holbrook Working, based on Census Bureau data for all reporting mills.

[a] Excluding granular flour for alcohol; see p. 11.

TABLE VI.—CANADIAN WHEAT AND FLOUR EXPORTS, MONTHLY FROM AUGUST 1938*

(Million bushels)

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	WHEAT AND FLOUR												
1938-39.....	8.18	16.16	26.27	22.14	8.91	11.15	9.61	7.97	5.98	18.00	13.50	12.17	160.03
1939-40.....	13.20	14.69	9.22	18.83	15.48	20.15	16.56	21.27	16.83	22.37	12.04	12.05	192.67
1940-41.....	11.56	9.62	10.81	13.71	8.95	15.22	18.11	21.50	30.76	36.82	31.08	23.07	231.21
1941-42.....	20.41	15.68	13.94	17.23	20.27	18.19	15.57	19.11	29.03	22.74	16.95	12.88	222.01
1942-43.....	15.44	9.54	14.02	15.23	7.69	13.63	15.50	22.78	23.09	25.94	.....	.....	.....
	FLOUR AS WHEAT												
1938-39.....	1.29	1.44	2.38	2.15	1.64	1.71	1.31	1.62	1.24	2.32	1.81	1.82	20.72
1939-40.....	1.71	1.87	2.00	2.58	4.06	3.26	2.52	3.22	2.34	3.25	2.29	1.41	30.52
1940-41.....	2.59	2.48	3.38	3.07	1.56	1.60	2.73	2.52	3.82	6.03	7.88	8.65	46.30
1941-42.....	6.46	2.97	1.98	2.64	4.19	3.38	4.75	4.05	5.08	4.15	....	....	.....
1942-43.....	4.36	3.82	3.78	3.80	4.42	4.84	4.20	5.81	5.48	5.44	....	....	.....

* Canadian overseas clearances of grain, plus United States imports of Canadian wheat for consumption and for milling in bond, plus Canadian exports of flour as reported currently in *Monthly Review of the Wheat Situation in Canada.* Flour is converted to equivalent bushels of wheat at the rate of 4.5 bushels of grain per barrel of flour.

TABLE VII.—ARGENTINE WHEAT AND FLOUR EXPORTS, AND WHEAT STOCKS, MONTHLY FROM AUGUST 1938*

(Million bushels)

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	WHEAT AND FLOUR EXPORTS												
1938-39.....	5.15	4.55	4.38	3.93	4.18	9.88	7.81	13.36	15.79	17.45	24.27	11.40	122.16
1939-40.....	16.06	14.10	14.76	17.00	17.67	13.39	10.81	11.55	15.85	17.82	16.76	13.51	179.29
1940-41.....	10.66	7.56	6.58	7.40	5.57	3.74	5.51	7.89	11.96	11.78	7.83	9.45	95.94
1941-42.....	8.33	6.27	5.54	6.18	5.59	6.39	6.17	6.38	9.49	8.09	6.60	8.16	83.26
1942-43.....	5.64	6.29	8.34	5.18	6.36	5.33	5.13	5.30	6.22	4.88	4.88	5.02	68.57
	COMMERCIAL STOCKS OF WHEAT (FIRST OF MONTH)												
1938-39.....	44.3	39.0	32.5	26.7	30.3	143.0	213.0	231.0	239.0	237.0	230.0	217.0	.....
1939-40.....	213.5	200.0	180.3	165.6	144.2	133.0	137.2	134.8	126.3	113.4	92.7	71.3	.....
1940-41.....	55.8	43.4	33.4	22.4	19.5	49.6	141.5	181.2	191.3	186.9	179.6	172.7	.....
1941-42.....	161.2	154.2	143.5	133.8	127.1	169.5	239.1	254.6	257.7	249.2	236.2	225.4	.....
1942-43.....	212.4	202.0	189.1	176.0	167.3	204.7	270.0	291.7	294.6	290.5	276.9	.....	.....

* Official data. Stocks data for January–July 1939 and from July 1942 are approximate or preliminary.

TABLE VIII.—UNITED STATES WHEAT DATA BY REGIONS*

Year	Total	Subtotals for states grouped by predominating wheat types				
		Hard red winter (A)	Hard red spring (B)	White (C)	Soft red winter (D)	Soft red winter (E)
	PRODUCTION IN YEARS OF LARGE CROPS, 1913–36[a] AND ANNUALLY 1937–43 (*million bushels*)					
1914	897	311	198	91	208	90
1915	1,009	257	342	106	221	83
1918	904	211	273	85	251	84
1919	952	337	138	102	287	87
1927	875	270	284	130	135	56
1928	914	359	294	124	87	50
1930	886	365	209	111	141	60
1931	942	480	91	91	207	73
1937	874	334	126	127	204	83
1938	920	330	204	132	179	75
1939	741	257	161	101	161	61
1940	813	266	203	106	170	68
1941	943	318	269	132	156	68
1942	981	418	292	112	94	65
1943	835	316	274	105	87	53
	SOWN ACREAGE, 1937–43 (*million acres*)					
1937	80.8[b]	35.6	20.1	6.74[b]	13.26	5.11
1938	79.0	36.1[b]	20.9	6.17	10.93	4.88
1939	62.8	28.7	15.9	4.99	9.03	4.19
1940	61.6	26.6	17.2	5.33	8.21	4.23
1941	62.3	27.7	16.8	5.19	8.43	4.24
1942	52.5	23.3	14.7	4.33	5.96	4.17
1943	54.1	22.8	16.3	5.00	6.04	4.06
Goal 1943	55.0	23.9	15.8	4.37	7.49	3.47
1944	68.0	31.2	19.1	5.28	7.74	4.66

* Latest data of U.S. Department of Agriculture, grouped as follows: (A), Kans., Nebr., Okla., Tex., Colo., N. Mex., Wyo.; (B) N. Dak., Mont., S. Dak., Minn.; (C) Wash.. Idaho, Ore., Calif., Utah, Ariz., Nev.; (D) Ill., Ohio, Ind., Mo., Mich., Iowa, Wis.; (E) Arkansas and all states which are both south of the Ohio and east of the Mississippi rivers.

[a] Crops over 870 million bushels.

[b] All-time peak.

TABLE IX.—UNITED STATES WHEAT SUPPLIES AND DOMESTIC DISAPPEARANCE BY CLASSES, 1938–43*

(*Million bushels*)

Year July–June	Total	Hard red winter	Soft red winter	White	Hard red spring	Durum
	PRODUCTION					
1938	920	396	226	102	155	41
1939	741	320	193	77	118	33
1940	813	330	206	83	160	34
1941	943	395	209	89	207	43
1942	981	483	160	77	215	46
1943	835	358	135	80	225	37
Average 1938–42	880	385	199	86	171	39
	SUPPLIES (CARRYOVER PLUS CROP)					
1938–39	1,073	456	263	122	186	46
1939–40	991	436	221	96	189	49
1940–41	1,093	466	230	103	242	52
1941–42	1,328	556	249	111	344	68
1942–43	1,613	776	215	118	423	81
1943–44	1,453	675	166	114	438	60
Average 1938–43	1,220	538	236	110	277	59
	DOMESTIC DISAPPEARANCE					
1938–39	714	272	230[a]	73	111	28
1939–40	663	278	194	58	102	31
1940–41	674	299	187	57	104	27
1941–42	669	247	192	63	134	33
1942–43	967[a]	441[a]	183	75	211[a]	57[a]
1943–44	...	...	...	..	...	..
Average 1938–43	737	308	197	65	132	35

* Latest estimates of U.S. Department of Agriculture. Production data in this table are based in part on periodical surveys of the distribution of wheat varieties. See J. A. Clark and B. B. Bayles, *Classification of Wheat Varieties Grown in the United States in 1939* (U.S. Dept. Agr., Tech. Bull. 795, June 1942). For dot maps of acreage distribution of wheat by classes, 1939, see *Wheat Situation*, March–April 1943, pp. 1–2, 9.

[a] Unusually heavy feed use.

TABLE X.—CONSERVATION AND PARITY PAYMENTS ON UNITED STATES CROPS FROM 1938–39*

(*Rates in cents per indicated unit*)

Crop year	Wheat (*per bushel*)		Corn (*per bushel*)		Rice (*per 100 pounds*)		Cotton (*per pound*)		Tobacco (*per pound*)		Potatoes (*per bushel*)	Peanuts (*per ton*)
	Conservation	Parity	Conservation	Parity	Conservation	Parity	Conservation	Parity	Conservation	Parity	Conservation	Conservation
1938–39	12.0	....[a]	10.0	....[a]	12.50	....[a]	2.40	....[a]	.50–1.80	....[a]	3.6–5.4	400
1939–40	17.0	11.0	9.0	6.0	9.00	12.0	1.80	1.60	.80–1.50	....[b]	3.0	300
1940–41	8.1	10.0	9.0	5.0	5.85	9.3	1.44	1.55	.54–1.08	....[b]	2.7	225
1941–42	8.0	10.0	9.0	5.0	5.50	20.0	1.37	1.38	.50–1.50	.2–.7[c]	2.3	225
1942–43	9.9	13.5	5.5	11.1	2.40	....[b]	1.20	....[b]	.40–1.30	.7[c]	1.8	125
1943–44	8.5	13.7[d]	3.0	7.2[d]	2.00	....[b]	1.00	....[b]	.40–1.20	.2–1.0[c]	...	110

* Official data. Payments are per indicated unit on the officially ascribed "normal yield" per acre of the acreage allotment for each crop, here entered under year of compliance and typical payment.

[a] Congress made no appropriation.

[b] Growers' returns above levels permitting parity payments.

[c] Certain types only. To others note *b* applies.

[d] Based on 1942 area sown, since overplanting of allotments was encouraged in the spring of 1943.

TABLE XI.—SELECTED WHEAT PRICES, WEEKLY FROM MID-MAY 1943*

(*U.S. cents per bushel*)

Week ending	United States							Canada (Winnipeg)				Argentina 78-kilo (fixed)	Australia, f.o.b. ports
	Futures (Chicago)		Cash					Futures		Cash			
	July	Sept.	Basic cash (Chi.)	No. 2 H.W. (K.C.)	No. 2 R.W. (St.L.)	No. 1 Dk.N.S. (Mnpls.)	Soft White (Port.)	July	Oct.	No. 1 Man.	No. 3 Man.		
May 22	143	143	147	138	153	142	125	90	90	89	85	55	72
29	144	145	147	138	...	142	126	90	92	90	85	55	72
June 5	145	145	147	138	...	142	129	91	92	91	85	55	72
12	145	145	147	138	...	143	130	93	94	93	87	55	72
19	144	144	146	137	...	140	130	92	93	93	86	55	72
26	143	143	145	135	...	139	131	91	92	92	84	55	72
July 3	146	147	148	140	157	142	133	92	94	93	85	55	72
10	147	148	149	142	163	144	134	96	97	96	88	55	72
17	145	145	148	140	166	140	133	99	100	101	92	55	72
24	...	145	148	140	167	140	135	98	99	101	91	55	72
31	...	144	148	139	169	140	138	99	99	102	91	55	72
Aug. 7	...	144	148	140	169	141	139	..	100	103	93	55	73
14	...	143	147	139	168	140	139	..	100	102	93	55	73
21	...	144	148	139	168	140	140	..	100	101	93	..	73
28	...	145	149	141	170	141	138	..	99	101	93	..	73
Sept. 4	...	146	149	144	172	143	136	..	99	101	93	..	76
11	...	146	150	144	172	143	136	..	101	103	94	..	78
18	...	148	154	147	173	143	136	..	104	108	99	..	..
25	...	...	154	146	169	143	137	..	108	110	104	..	..

* For sources and methods of computation, see WHEAT STUDIES, December 1942, XIX, 120.

TABLE XII.—CONTINENTAL EUROPEAN WHEAT SUPPLIES AND UTILIZATION, AVERAGE 1934–39*

(*Million bushels, except as noted*)

Country	Crop	Net imports (+) or exports (−)	Apparent utilization	Stocks		Utilization			Population (*millions*)	Per capita utilization (*bu.*)		
				Net change	Total year-end	Total	Seed	Ex-seed[a]		Apparent	Total	Ex-seed[a]
Total	1,528.7	+117.8	1,646.5	−7.0	284.0	1,653.5	177.8	1,475.7	340.85	4.83	4.85	4.33
Four neutrals	183.2	+ 27.2	210.4	−1.9	44.9	212.3	25.1	187.2	42.65	4.93	4.98	4.39
Italy	267.5	+ 18.3	285.8	−2.4	28.0	288.2	24.0	264.2	42.88	6.67	6.72	6.16
Danube	352.7	− 54.4	298.3	+ .7	42.7	297.6	57.8	239.8	49.83	5.99	5.97	4.81
Germany, Austria, Czechoslovakia	245.6	+ 30.4	276.0	+3.5	62.6	272.5	20.1	252.4	89.58	3.08	3.04	2.82
Others	479.7	+ 96.3	576.0	−6.9	105.8	582.9	50.8	532.1	115.91	4.97	5.03	4.59
Sweden	25.6	− .5	25.1	+ .5	4.5	24.6	2.4	22.2	6.27	4.00	3.92	3.54
Switzerland	5.9	+ 16.9	22.8	+ .4	5.2	22.4	.5	21.9	4.17	5.47	5.37	5.25
Spain	134.5	+ 10.4	144.9	−2.0	30.0	146.9	19.7	127.2	24.90	5.82	5.90	5.11
Portugal	17.2	+ .4	17.6	− .8	5.2	18.4	2.5	15.9	7.31	2.41	2.52	2.18
Italy	267.5	+ 18.3	285.8	−2.4	28.0	288.2	24.0	264.2	42.88	6.67	6.72	6.16
Hungary	81.6	− 18.2	63.4	+ .1	10.1	63.3	10.4	52.9	8.99	7.05	7.04	5.88
Yugoslavia	89.3	− 6.7	82.6	− .9	11.0	83.5	12.8	70.7	15.18	5.44	5.50	4.66
Rumania	123.4	− 25.3	98.1	+ .4	14.4	97.7	25.3	72.4	19.43	5.05	5.03	3.73
Bulgaria	58.4	− 4.2	54.2	+1.1	7.2	53.1	9.3	43.8	6.23	8.70	8.52	7.03
Germany	174.0	+ 23.2	197.2	+4.6	42.4	192.6	13.0	179.6	67.61	2.92	2.85	2.66
Austria	14.7	+ 8.3	23.0	+ .2	2.9	22.8	1.6	21.2	6.76	3.40	3.37	3.14
Czechoslovakia	56.9	− 1.1	55.8	−1.3	17.3	57.1	5.5	51.6	15.21	3.67	3.75	3.39
France	301.8	+ 1.9	303.7	−9.4	73.2	313.1	28.4	284.7	41.95	7.24	7.46	6.79
Belgium, Luxemburg	18.1	+ 38.6	56.7	+ .5	6.6	56.2	1.2	55.0	8.63	6.57	6.51	6.37
Netherlands	15.8	+ 23.4	39.2	+1.0	5.1	38.2	.8	37.4	8.56	4.58	4.46	4.37
Denmark	13.8	+ 9.2	23.0	.0	2.4	23.0	.9	22.1	3.74	6.15	6.15	5.91
Norway	2.1	+ 8.2	10.3	+ .4	3.4	9.9	.3	9.6	2.89	3.56	3.43	3.32
Finland	6.0	+ 3.5	9.5	+ .3	1.2	9.2	.6	8.6	3.81	2.49	2.41	2.26
Estonia	2.7	.0	2.7	.0	.2	2.7	.4	2.3	1.13	2.39	2.39	2.04
Lithuania, Latvia	15.8	− .9	14.9	.0	1.8	14.9	2.1	12.8	4.49	3.32	3.32	2.85
Poland	75.9	− 4.0	71.9	.0	7.8	71.9	10.7	61.2	33.78	2.13	2.13	1.81
Greece	27.7	+ 16.4	44.1	+ .3	4.1	43.8	5.4	38.4	6.93	6.36	6.32	5.54

* Based on revised annual data (in part Food Research Institute estimates) for five crop years ending July 1939, comparable with Table IV in M. K. Bennett, "World Wheat Utilization since 1885–86," WHEAT STUDIES, June 1936, XII, 395–402.

[a] Very largely for food, though including considerable fractions fed to poultry and other livestock in Denmark, the Netherlands, and Belgium.

ANALYTICAL INDEX

TEXT

Abandonment, 6, 15
Acreage, wheat: in Europe, 19; expansion, 4, 6, 15, 16–17, 18, 22–23, 27; restriction, 3, 7, 12, 15, 16, 22–23; sown *vs.* harvested, 6; United States goals, 6, 8
Agriculture, Minister or Ministry of: Argentina, 15; Germany, 19; Great Britain, 16 n., 17 n., 28
Alaska: war in, 1; wheat shipments to, 10
Alcohol, grain for, 4, 7, 10–11, 12, 23, 26
Allied Military Government, 1
Anderson, Sir John, 17 n.
Animal products, 4, 5, 12, 25; *see also* Livestock
Argentina, new government of, 6, 15
Australia, election in, 6–7
Australian Wheat Board, 16

Badoglio, Marshal Pietro, 1
Balkans, *see* Danubian countries
Barley, *see* Feed grains; Flour, admixture requirements
Beans and peas, dried, 5, 7, 24
Belgium, 20
Bennett, M. K., 2 n., 5 n.
Brazil, 14
Bread: prices, 13; wartime, 17, 21; *see also* Rationing
Bureau of Agricultural Economics, 7, 11
Bureau of the Census, 9

Canadian Wheat Board, 6, 13
Carryovers, wheat, in four chief exporting countries, 3, 12
Ceilings, price (U.S.), 8; *see also* Price control
China, 19, 23
Coal, wartime stringency, 27; *see also* Fuel
Combined Food Board, 23
Commodity Credit Corporation: owned and pooled wheat held by, 10 n; program for feed and industrial use of wheat, 10, 11, 13, 14; proposed wheat swap, 10; sugar purchase, 5 n.
Conservation payments (U.S.), 12
Consumption, wheat: Australia, 15; U.S. civilian, 10; *see also* Utilization
Copp, P. M., 24 n.
Corn: Argentine crop failure and developments, 4, 6, 14–15, 23; U.S. crops and policy, 3, 7, 12; *see also* Feed grains; Flour, admixture requirements
Cranborne, Lord, 28–29
Crop estimates, 4, 7, 12, 15, 16
Currency, as a problem in relief, 5

Dairy products, *see* Animal products
Danubian countries, crops and prospective relief needs, 19, 20, 25
Davis, J. S., 1, 6 n., 12 n.
Defense Supplies Corporation (U.S.), 11
Denmark, 20
Drought, 10, 14, 18, 19, 20, 23

Economic Warfare, British Ministry of, 18 n.
Egypt, 4, 18
Eire, 16
Enrichment, *see* Flour
Export subsidization, U.S., 5, 7

Famine conditions, 18, 19; *see also* Starvation
Farm bloc, *see* Political pressures
Farnsworth, Helen C., 5 n.
Fats and oils, 5
Federal Security Agency, 21
Feed grains: Canadian production, 12; food use of, 19, 20, 21; U.S. imports of Canadian, 4, 7, 12, 13; *see also* Corn
Feed use (wheat and other grains): in Europe, 4; in 1942–43, 3, 10; in 1943–44, 26; supplies and situation in North America, 2, 7, 8, 12, 23; U.S. imports of Canadian wheat for, 5, 7, 10, 12–13
Fertilizer, 15
Fixed and/or minimum prices, *see* Canadian Wheat Board; Grain Regulating Board
Flaxseed, 7, 12
Flour: admixture requirements, 17, 20; British order for, 13, 14, 16; British "standard," 17; consumption, 10, 15; enrichment, 21–22; extraction rates, 16, 17, 20, 21; international trade, 6, 9–10, 13; prices, 8, 13; production, 8–9, 13
Food, British Ministry of, 17 n.
Food and Drug Administration (U.S.), 21
Food, Drug, and Cosmetics Act (U.S.), 22
Food and Nutrition Board, 21
Food policy, Nazi, in Europe, 19, 20, 23
Food situation: Europe, 5, 19, 20–21, 23–25; Far East, 19, 23, 25; India, 18, 19; USSR, 18–19, 23, 25
Food use of wheat, 2, 4, 12
France, 19, 20
French North Africa: relief shipments and situation, 5, 17–18, 24; wheat exports, 19, 20
Fuel in Argentina: problem of, 4, 15; use of grain for, 2–3, 14–15, 23, 26; *see also* Coal

Grain Regulating Board (Argentina), 15
Greece, 19, 20, 21
Gregory, Gen. E. B., 10 n.

Harper, F. A., 23 n.
Hoarding of grain, by growers, 5, 19
Hogs, 4, 15, 20, 24, 27 n.
Hudson, R. S., Minister of Agriculture (Great Britain), 17 n., 28
Hunger, *see* Famine; Starvation

Import requirements: Continental Europe, 20–21; Great Britain, 17; USSR, 18–19
India, 4, 5, 18, 23
Industrial uses of wheat, 2, 3–4, 10–11; *see also* Alcohol; Fuel
Inflation, 12, 19
Interim Commission on Wheat and Agriculture, 23, 29
International Wheat Agreement (1942), 6, 26
International Wheat Council, 6, 23, 29
Invasion, food preparations for European, 6, 13
Italy, 1, 13, 19–20, 24–25

Japan, 1

Labor shortages, 9, 12, 15
League of Nations, 24 n.
Legumes, 5, 7, 24
Lehman, H. H., 23
Lend-lease, 1, 4, 10, 11, 18, 23, 25
Linseed, 4, 14–15
Livestock, increased numbers of, 4, 15, 17, 20, 23, 24, 25, 26, 27 n.
Loan rates on wheat, 11
Losses, shipping, 1; *see also* Shipping conditions

Maize, *see* Corn
Manpower shortages, 9, 12, 15
Meat, *see* Animal products
Mexico, 10, 14
Military demands for wheat, 1, 4, 10, 11, 17; *see also* Lend-lease
Milk, *see* Animal products
Millers, regulation of British, 17; *see also* Subsidies
Millfeed, 15 n.
Milling, flour: capacity and utilization of, 8, 13, 16, 28; seasonal variations in U.S., 8
Milling in bond, 5, 9, 10
Milling quotas, 17
Mitchell, Helen S., 28 n.
Molasses, 1, 11
Mussolini, 1
Myers, W. I., 12 n.

National Research Council, 21
Netherlands, 20
Norway, 20
Nourse, E. G., 9 n.
Nutrition: level of, in Great Britain, 20; recent developments in, 21–22

Oats, *see* Feed grains; Flour, admixture requirements
Office of Price Administration, 8, 22; *see also* Price control
Outlook: consumption and utilization, 4; international trade, 10; relief shipments of wheat, 18–19, 20–21, 22–28; supplies for 1943–44, 1, 2, 15

Pacific Northwest, 6, 8
Parity and conservation payments, 12
Parity prices for wheat, 11
Peanuts, 22
Poland, 20
Political pressures and wheat: Canada, 14; U.S., 6, 11–12
Portugal, 19, 20
Potatoes, 5, 17, 19, 20; *see also* Flour, admixture requirements
Premiums on soft red winters, 7–8
Price control, 12; *see also* Office of Price Administration
Prices, bread, 13
Prices, wheat: basic, in Great Britain, 16 n.; level of, 6–7; U.S. farm, 11; *see also* Canadian Wheat Board; Grain Regulating Board
Production, wheat, in 1943, 3, 15, 16, 18, 19

Rationing of bread and/or flour, 17, 20
Reconstruction Finance Corporation, 11
Relief: in French North Africa, 5, 17–18, 24; problems and plans, 1, 4, 5, 10, 20–21, 22, 23–24, 27–29; prospective needs, 18–19, 24–26; shipments to Greece and Italy, 20, 21; supplies for, 4, 6, 13–14, 16, 17, 25–27
Relief and Rehabilitation Administration (United Nations), 23
Reserves, wheat: Axis, 4; Continental Europe, 19; Great Britain, 17
Returns to growers, 12; *see also* Political pressures; Subsidies
Rex wheat, 11 n.
Rice, 18, 21
Rubber, synthetic, 11
Rye, Canadian production, 12; *see also* Flour, admixture requirements

Scully, W. J., Premier (Australia), 13 n.
Seed use of wheat, 2, 12, 15, 26
Shipping conditions: easing, 1, 6, 11, 16; wartime stringency, 1, 14, 16, 18, 22
Soft red winter wheat, shortage of, 7–8, 12
Soil-conservation payments, 12
South Africa, Union of, 14, 18
Soybeans, 5, 7, 8, 22, 24
Spain, 14, 19, 20
Speculation, 11, 13
Starvation and semistarvation, 5, 20, 23–24; *see also* Famine
Statistics, wartime limitations on wheat, 6, 9, 16–17
Stocks, wheat, British, 4, 6; *see also* Carryovers; Reserves; Supplies
Storage, wheat: Australia, 16; U.S., 7
Subsidies: to flour millers (Canada), 13; on foodstuffs (U.S.), 12; to growers, 23
Sugar, 1, 5
Sunflowers, 15
Supplies, wheat; distribution of, 22, 26; for 1943–44, 2–3, 7, 12
Surface, F. M., 28 n.
Sweden, 19, 20
Switzerland, 19, 20

Tariff, 13
Trade in wheat and flour, international: in 1942–43, 9–10, 12, 14, 15; wartime restriction of, 5, 20; *see also* Flour
Transportation facilities and congestion: Europe, 4, 5, 18, 25; North America, 7, 8, 10, 12, 13
Turkey, 4, 18
Types of wheat, distribution of, 7–8

United Nations, 4, 5 n.; Conference on Food and Agriculture, 23, 28, 29; Relief and Rehabilitation Administration, 23
USSR: acreage and crops, 4, 18; bread-grain supplies, 4; food situation, 5, 18–19, 23; Nazi drafts of grain from, 4, 19; prospective relief needs, 18–19, 25, 26; shipments to, 6, 18; war in, 1
Utilization, wheat, in 1942–43, 4, 7, 15–16, 19

Vitamins, *see* Flour, enrichment

War Production Board, 8 n., 9 n., 11 n.
Weather conditions affecting wheat, 15, 16, 18, 19
Winnipeg Grain Exchange, 14
Winterkilling, 7, 19
Wood, Maj. Gen. E., 18 n.
Woolton, Lord, Minister of Food (Great Britain), 17 n.
Working, Holbrook, 8
World War II: course of, and relief needs, 4, 18, 25; wheat situation in, compared with World War I, 2, 5, 12 n., 24

Yields per acre, wheat, 2, 12, 15, 16

CHARTS AND APPENDIX TABLES

Acreage, sown, U.S., 33
Carryovers, *see* Stocks
Corn: parity and conservation payments, U.S., 33; production, U.S. and Argentina, 3
Cotton, parity and conservation payments, U.S., 33
Exports, wheat and flour, monthly: Argentina, 32; Canada, 32
Flour, wheat, production, U.S., monthly, 32
Indexes of North American flour output and milling capacity, with comparisons, 9
Parity and conservation payments on various crops, U.S., 33
Peanuts and potatoes, parity and conservation payments, U.S., 33
Price spreads, wheat, No. 2 Red Winter at St. Louis and Chicago basic cash (1923–43), 8
Prices, wheat, selected, in four exporting countries, 34
Production, wheat: in four chief exporting countries, 3; in principal producing areas and countries, 30; soft red winter, U.S. (1923–43), 8; U.S., by classes, 33
Rice, parity and conservation payments (U.S.), 33
Soft red winter wheat, 8, 33
Stocks, wheat: Argentine commercial, 32; U.S. and Canada, 30
Supplies, wheat, in four chief exporting countries (1914–19 and 1938–43), 2
Supplies and disappearance, wheat: approximate world, 2, 30; in four chief exporting countries, 31; U.S., total and by classes, 33
Supplies and utilization, wheat, in Europe, 34
Tobacco, parity and conservation payments (U.S.), 33

WHEAT STUDIES *of the* FOOD RESEARCH INSTITUTE

VOLUME XVIII

NO.		PRICE
1.	*World Wheat Survey and Outlook, September 1941.* Helen C. Farnsworth and B. M. Jensen. September 1941, pp. 1–36	$ .75
2.	*Wheat in National Diets.* M. K. Bennett. October 1941, pp. 37–76	1.00
3.	*Why Enrichment of Flour?* A. E. Taylor. November 1941, pp. 77–108	.75
4.	*The World Wheat Situation, 1940–41: A Review of the Crop Year.* Helen C. Farnsworth. December 1941, pp. 109–90	1.25
5.	*World Wheat Survey and Outlook, January 1942.* Helen C. Farnsworth and B. M. Jensen. January 1942, pp. 191–227	.75
6.	*Federal Crop Insurance in Operation.* J. C. Clendenin. March 1942, pp. 229–90	1.25
7.	*Variability in Wheat Yields and Outputs. Part I. Cycles or Random Fluctuations.* V. P. Timoshenko. April 1942, pp. 291–338	1.00
8.	*World Wheat Survey and Outlook, May 1942.* J. S. Davis. May 1942, pp. 339–66	.75

VOLUME XIX

1.	*World Wheat Survey and Outlook, September 1942.* J. S. Davis. September 1942, pp. 1–24	1.00
2.	*New International Wheat Agreements.* J. S. Davis. November 1942, pp. 25–84	1.00
3.	*Wheat in the Third War Year: Major Developments, 1941–42.* M. K. Bennett, Helen C. Farnsworth, and Rosamond H. Peirce. December 1942, pp. 85–120	1.00
4.	*World Wheat Survey and Outlook, January 1943.* M. K. Bennett, Helen C. Farnsworth, and V. P. Timoshenko. January 1943, pp. 121–50	1.00
5.	*Variability in Wheat Yields and Outputs. Part II. Regional Aspects of Variability.* V. P. Timoshenko. March 1943, pp. 151–202	1.00
6.	*World Wheat Survey and Outlook, May 1943.* Helen C. Farnsworth, V. P. Timoshenko, and Meriam A. Clough. May 1943, pp. 203–33	1.00

VOLUME XX

1.	*Wheat Outlook and Policies.* J. S. Davis. September 1943, pp. 1–36	1.00

RECENT CONTRIBUTIONS *from the* FOOD RESEARCH INSTITUTE

(Numbered reprints available free on request)

NO.

122. "Access to Raw Materials in the Postwar World." K. E. Knorr. *Harvard Business Review,* Spring 1943
123. "Statistical Laws of Family Expenditure." Holbrook Working. *Journal of the American Statistical Association,* March 1943
124. "Food for Europe: Seven Questions." M. K. Bennett. *Free World,* May 1943
125. "Problems of Invasion and Occupation." Karl Brandt. *Foreign Affairs,* July 1943
126. "What Are Essential Food Requirements in Wartime?" M. K. Bennett. *Proceedings of the Western Farm Economics Association,* June 1943
127. Discussion of "Form and Degree of International Economic Co-operation in the Postwar World" (by H. S. Ellis). J. S. Davis. *Ibid.*
128. "Rationing as an Essential to Food Conservation and Equitable Distribution, Including Considerations of Various Methods." Karl Brandt. *Ibid.*
129. "Wartime Food Management: An Analysis with Recommendations." J. S. Davis. *Economic Sentinel* (Los Angeles Chamber of Commerce), August 11, 1943
130. "Rubber after the War." K. E. Knorr. *India Rubber World,* July–October 1943

FOOD RESEARCH INSTITUTE
STANFORD UNIVERSITY

A research department of Stanford University, established in 1921 jointly by Carnegie Corporation of New York and the Board of Trustees of the Leland Stanford Junior University, for research in the production, distribution, and consumption of food.

RESEARCH STAFF

MERRILL K. BENNETT, Executive Director
JOSEPH S. DAVIS, Director
JOHN B. CANNING, Associate*
KARL BRANDT, Economist
VLADIMIR P. TIMOSHENKO, Economist
VERNON D. WICKIZER, Economist†
HOLBROOK WORKING, Economist*
HELEN C. FARNSWORTH, Associate Economist
KLAUS E. KNORR, Associate Economist†
ROSAMOND H. PEIRCE, Assistant Statistician
PAVEL P. EGOROFF, Assistant Economist†
ALONZO E. TAYLOR, Director Emeritus

* On leave.
† Acting.

PUBLICATIONS

WHEAT STUDIES

Six numbers in Volume XX (1943–44), including two *Survey and Outlook* issues covering world wheat developments in six-month periods preceding dates of publication; a brief *Review* of major world wheat developments in 1942–43; and three studies of special subjects. Subscription: $6.00 per volume.

Bound volumes I–XIX, each, $7.50.

GRAIN ECONOMICS SERIES

Books, wider in scope or of greater length than issues of WHEAT STUDIES.

No. 2. N. Jasny, *Competition among Grains.* January 1940. 606 pp. $4.00.

No. 3. V. D. Wickizer and M. K. Bennett, *The Rice Economy of Monsoon Asia.* November 1941. 358 pp. $3.50.

FATS AND OILS STUDIES

Books on fats and oils of animal and vegetable origin, dealing primarily with economic aspects—production, trade, prices, and utilization—but with due reference to technical knowledge.

No. 6. Karl Brandt, *The German Fat Plan and Its Economic Setting.* September 1938. 344 pp. $3.00.

No. 7. Karl Brandt, *Whale Oil: An Economic Analysis.* June 1940. 264 pp. $3.00.

COMMODITY POLICY SERIES

Books that inquire into the problems, nature, aims, techniques, limitations, and achievements of representative commodity controls and into their future possibilities.

No. 1. Jozo Tomasevich, *International Agreements on Conservation of Marine Resources.* March 1943. 297 pp. $3.00.

No. 2. V. D. Wickizer, *The World Coffee Economy, with Special Reference to Control Schemes.* August 1943. 270 pp. $3.00.

MISCELLANEOUS PUBLICATIONS

Books embodying the results of research in fields other than those covered by the series listed above, or more comprehensive in character.

No. 9. J. S. Davis, *On Agricultural Policy, 1926–1938.* January 1939. 494 pp. $3.00.

WAR-PEACE PAMPHLETS

Brief discussions of topics important in wartime or in planning the peace.

No. 1. Helen C. Farnsworth, *Wartime Food Developments in Germany.* September 1942. 36 pp. 25c.

No. 2. Karl Brandt, *Fats and Oils in the War.* June 1943. 57 pp. 25c.

CONTRIBUTIONS

Chiefly reprints of papers, by members of the Food Research Institute, published in professional journals. See inside back cover.

List of publications available on request. Address orders and inquiries to

FOOD RESEARCH INSTITUTE
STANFORD UNIVERSITY
STANFORD UNIVERSITY, CALIFORNIA