CROP and BUSINESS CONDITIONS

NINTH FEDERAL RESERVE DISTRICT

REPORT OF

JOHN H. RICH, FEDERAL RESERVE AGENT

TO THE

FEDERAL RESERVE BOARD

WASHINGTON, D. C.

CURTIS L. MOSHER
Assistant Federal Reserve Agent

J. F. EBERSOLE
Assistant Federal Reserve Agent

108th Report MINNEAPOLIS, MINN. January 28, 1924

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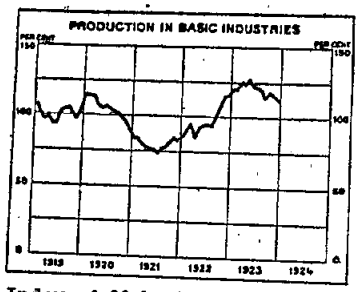
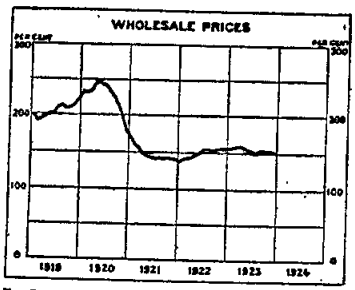
THE YEARS 1919 TO 1923 IN THE NINTH FEDERAL RESERVE DISTRICT

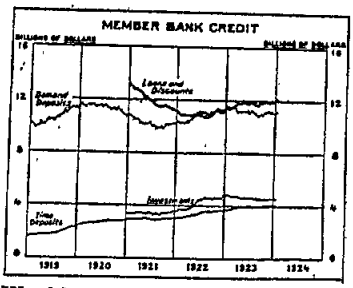
Volume of Business	1919	1920	1921	1922	1923
Debits to Individual Accounts (9 cities)	$7,910,000,000	$8,578,000,000	$6,542,000,000	$6,965,000,000	$7,495,000,000
Retail Sales					
General Merchandise (25 stores)	.....	.....	.....	$31,848,897	$33,921,827
Lumber (642 yards) Bd. Ft.	.....	204,458,000	167,324,637	185,773,399	176,207,698
Wholesale Sales					
Shoes (6 firms)	$13,888,931	$12,829,316	$8,431,171	$9,197,733	$9,426,270
Hardware (14 firms)	.....	.....	21,155,856	20,280,067	24,307,709
Groceries (56 firms)	.....	.....	61,810,200	63,682,481	67,789,977
Agricultural Implements (10)	.....	.....	.....	17,876,291	17,358,910
Manufacturing					
Lumber (11 firms) Bd. Ft.	.....	.....	194,143,089	248,973,792	333,379,340
Mining					
Copper (6 firms) lbs.	308,005,921	308,124,765	128,984,503	284,787,800	358,616,600
Silver (5 firms) oz.	7,924,900	8,161,506	3,788,877	8,820,456	9,961,755
Gold (2 firms) oz.	42,541	33,120	10,751	27,248	29,811
Coal (2 firms) tons	1,122,452	1,422,451	1,024,300	764,130	1,152,121
Building Permits					
Number (18 cities)	16,063	14,879	21,970	24,091	25,495
Valuation (18 cities)	$49,127,825	$44,007,658	$49,852,603	$71,185,618	$84,626,543
Stocks of Goods					
Lumber Mfrs. (11 firms) Bd. Ft.	.....	.....	225,650,297	162,405,148	184,280,300
Retail Stores (24)	.....	.....	.....	$7,112,249	$7,538,575
Lumber Retailers (607 Yards) Bd. Ft.	.....	.....	122,738,068	110,215,260	104,468,700
Prices					
Median Cash Grain Prices at Minneapolis—	Dec., 1919	Dec., 1920	Dec., 1921	Dec., 1922	Dec., 1923
Wheat No. 1 D. N. S. (Bu.)	.....	$1.81½	$1.33	$1.30⅛	$1.19¼
Corn, No. 3, Yellow (Bu.)	.....	.72	.40	.66	.64¾
Oats, No. 3, White (Bu.)	.....	.46	.30¼	.40	.39¾
Barley, No. 3 (Bu.)	.....	.83	.45	.59	.57
Rye, No. 2 (Bu.)	.....	1.48	.78½	.83½	.65¼
Flax, No. 1 (Bu.)	.....	2.30	1.89½	2.62	2.46½
Median Livestock Prices at South St. Paul—					
Butcher Cows (Cwt.)	$7.00	5.50	4.00	4.50	5.00
Butcher Steers (Cwt.)	9.25	7.75	5.25	6.50	6.75
Stock and Feeder Steers (Cwt.)	8.50	7.00	4.75	5.25	5.25
Veal Calves (Cwt.)	15.00	12.00	7.00	7.75	7.75
Hogs (Cwt.)	13.55	11.33	6.50	8.00	6.50
Lambs (Cwt.)	15.25	10.50	9.50	14.00	12.25
Wholesale Produce Prices at Minneapolis—					
Flour, Washburn-Crosby Gold Medal (Bbl.)	.....	10.00	7.25	7.10	6.20
Butter, special creamery (lb.)	.....	.53	.37	.49	.52
Eggs, No. 1, Candled (doz.)	.....	.58	.38	.38	.34
Hens, over 4 lbs. (lb.)	.....	.24	.21	.18	.18
Potatoes, Early Ohios (Cwt.)	.....	1.80	2.25	1.10	1.00



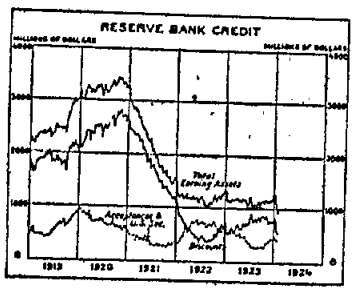
Index of 22 basic commodities corrected for seasonal variation (1919 = 100). Latest figure—December, 1923.



Index of U. S. Bureau of Labor Statistics. (1913 = 100, base adopted by Bureau). Latest figure—December, 1923.



Weekly figures for member banks in 101 leading cities. Latest figure, January 16, 1924.



Weekly figures for 12 Federal reserve banks. Latest figure, January 23, 1924.

Summary of National Business Conditions

(Compiled Jan. 25 by Federal Reserve Board)

Production of basic commodities showed a further decline in December and wholesale prices receded slightly. Christmas trade was somewhat larger than a year ago. Changes in the banking situation in January reflected chiefly an unusually large return flow of currency after the holiday season.

PRODUCTION: The index of production in basic industries declined four per cent in December to the low point of the year. The decrease for the month reflected principally a large reduction in consumption of cotton, but also reduced operations in the woolen, petroleum, sugar and lumber industries. Production of pig iron and anthracite increased. The Federal Reserve Board's index of factory employment decreased one per cent, and was four per cent lower than in the spring. The largest decreases were at plants manufacturing food products and railroad equipment. Building contract awards in December were smaller than in November, but almost 25 per cent larger than a year ago.

TRADE: Railroad shipments continued to decrease during December and were slightly less than in December, 1922. Loadings of coal and grain were smaller than a year ago, while loadings of miscellaneous merchandise and livestock were in larger volume. The volume of wholesale trade showed more than the usual seasonal decrease and was at about the same level as a year ago. Sales of meat, hardware and drugs were larger than in December, 1922, while sales of dry goods and shoes were smaller. Retail trade, though larger in December, 1923 than in any other month on record, did not show as large an increase over November as is usual at the Christmas season.

PRICES: Wholesale prices, according to the index of the Bureau of Labor Statistics, decreased less than one per cent during December. The chief reductions occurred in prices of fuel and building materials, while prices of clothing and metals increased, and prices of farm products remained unchanged. During the first two weeks of January prices of corn, wheat, pig iron, petroleum, and lumber advanced while quotations on cotton, sugar, and copper were lower.

BANK CREDIT: The volume of credit extended by the Federal reserve banks showed the usual sharp increase during the latter part of December in response to holiday requirements for credit and currency and financial settlements falling due on the first of January. With the passing of the seasonal demands there was an unusually rapid return flow of currency to the reserve banks, reflected both in an increase of reserves and a decrease of Federal reserve note circulation. Member banks used the currency returned from circulation to reduce their borrowings, with the consequence that the earning assets of the Federal reserve banks declined by $360,000,000 during the four weeks following Christmas, or approximately $150,000,000 more than during the corresponding period of 1923. At the middle of January the volume of reserve bank credit outstanding was below $1,000,000,000 for the first time since early in 1918.

Loans made largely for commercial purposes by member banks in principal cities declined between December 12 and January 16 to a point $264,000,000 lower than at the peak in October and to about the level of July, 1923. This decrease in loans, which was general throughout the country, was accompanied by a movement of funds to the financial centers and an increase in loans on securities, principally in New York.

Easier money conditions in January were reflected in a further slight decline in the rate on prime commercial paper to 4¾% compared with 4¾% to 5% in December, and in increased activity in the investment markets.

DISTRICT SUMMARY

There has been a steady improvement in the farmer's position when measured by estimated crop income during the last two years in all the states contained wholly within this district, except that there was a decline in North Dakota in 1923 as compared with 1922 only. The accuracy of these estimates of crop income is confirmed by data compiled in this office with reference to farmers' purchases of lumber and farm implements, wholesale distribution of groceries, and by the collection situation generally. The most careful estimates that we have been able to make, from data as recent as July 1st, as to the amount outstanding of credit extended to farmers show that there has been a negligible amount of reduction in their obligations during recent years, owing to a liberal use of refunding facilities and worthless notes which have been written off by the banks. The farmer has been adjusting his wheat acreage downward and is now faced with the serious problem of deciding whether or not it is advisable to increase his flax acreage again next year.

Corn and oats continue to move to market in large volume and are providing the farmer with more cash income this year than he has heretofore received from them. It is noteworthy that the prices of these two grains have declined less than others as compared with a year ago and this is due to larger demand for feeding herds. Although wheat has been declining both in production and in marketing, there has been a decline in price owing to the increase in European production and a decrease of exports from this country, with an accompanying increase in terminal stocks. The record-breaking movement of hogs continued in December with a volume one-fourth greater than a year ago which, coupled with higher prices for all kinds of live stock, has improved the income of the animal producer. Prices for all the grains were firm during the month except corn.

The total money volume of business transacted in this district during December was sustained at the November level although during the past five years there has been an average decline in the same period of two per cent. Manufacturing continued at the November level in the production of linseed and diminished in the production of flour. Retail trade in merchandise enjoyed a normal seasonal increase in December and maintained the volume of a year ago, and sales of lumber increased over a year ago at retail. Wholesale trade exhibited mixed trends but farm implements and shoes moved in larger volume than in the preceding month; and when compared with a year ago, farm implements, hardware, and dry goods enjoyed an improved volume. Prospective business activity as reflected in building permits in December maintained November standards and was about double that of a year ago in valuation.

Banking statements indicate that there was a general tendency to reduce loans during December and January except for a few weeks of enlarged borrowing and greater note issues just prior to the Christmas shopping season. An increase of about six millions of Federal Reserve notes took place during December, of which about five millions had been returned and retired by the middle of January. That funds exist in ample supply is shown by the fact that interest rates eased slightly.

TOPICAL REVIEWS

Farm values of the last three crops: At the close of the year it is instructive to sum up the gains made in the northwestern farming situation during the reconstruction period after the crash of 1920. Without a doubt the farmer's position has steadily improved.

The income from the nine most important crops in the Northwest has increased each year from 1921 to 1923 in every state, except North Dakota, in which state there was a severe setback in wheat in 1923, but even in North Dakota the 1923 crop income was larger than in 1921. Below are figures comparing the crop returns at December 1 farm prices for the years 1921 to 1923 in the four states: (Figures published by the United States Department of Agriculture, 000's omitted).

	1923	1922	1921
Minnesota	$265,212	$247,942	$182,571
North Dakota	141,316	214,825	135,273
South Dakota	178,510	167,993	106,138
Montana	87,487	86,617	63,047
Total	$672,525	$717,377	$487,029

Corn has been the greatest factor in the improved crop cash returns in all four states. The statement is often made that corn is not a cash crop and the price of corn, therefore, is not significant, because it must be converted into pounds of meat to be marketed. This statement is very true for the United States as a whole, but in many parts of the Northwest, especially in 1923, corn has been a cash crop on account of the poor quality of corn in many sections of the corn belt, which has compelled stock feeders to purchase corn in the terminal markets. The Northwest has benefited from this as is shown by the record sales of northwestern corn in the Minneapolis market.

Flax, oats and wild hay have also been steadily contributing to the increased cash return of the farmer in these states. Flax and oats plantings have increased due to reductions of wheat, rye and potato acreage, as a result of the unsatisfactory prices received for the latter products during the last year or two.

The farm values of the nine crops in the four states for the years 1921 to 1923 at December 1 prices are given in the table below, (000's omitted):

	1923	1922	1921
Corn	$191,254	$142,855	$89,664
Wheat	135,026	225,231	141,906
Oats	100,208	97,790	49,829
Barley	28,831	30,994	17,730
Rye	14,137	39,395	15,337
Flax	35,846	21,411	11,223
Potatoes	32,420	27,211	47,004
Tame Hay	71,699	77,296	60,189
Wild Hay	63,104	55,194	54,147

Rising farm purchases: The buying power of the rural sections of the Ninth District has improved steadily since 1921, and the improvement has been more rapid in 1923 than in 1922. Lumber sales in dollars were four per cent larger in 1922 than in 1921 and 12 per cent larger in 1923 than in 1921. Farm implement sales increased 17 per cent in 1922 over 1921 and were about as large in 1923 as in 1922. In farm implement sales there were considerable variations in 1923 activity, some firms showing good increases and others declines in sales. Sales of wholesale groceries increased two per cent between 1921 and 1922 and were nine per cent larger in 1923 than in 1921. Sales in each of these states, except North Dakota, were larger in 1923 than in 1922. In North Dakota, sales of lumber declined three per cent in 1923 from the 1922 volume and sales of groceries at wholesale were also very slightly smaller.

The farmers and populace of rural communities have been paying their debts for merchandise much more satisfactorily in 1923 than in 1922, with the exception of those in South Dakota. The improvement has been most marked in North Dakota, although the improvement in Minnesota has been nearly as great. These conclusions are based on collection figures of the firms referred to in the preceding paragraph.

Farm credit has not contracted much: In the face of larger cash returns on northwestern crops, the farmer has not been unduly pressed by his banker in the matter of reducing his borrowings. Judging by published figures, there has been a tremendous reduction in the loans of country banks to their customers, but the "liquidation" has been apparent rather than real. If the loans which have been converted into real estate holdings through default and the loans in closed banks, whose figures are not included in published abstracts of the condition of state and national banks, and the losses charged off by solvent banks, directly or by the paper being taken out by directors and stockholders and in other ways, be combined and added to the total of loans on June 30, 1923, it becomes clear that there has been only a minute reduction in loans in the agricultural regions of the Northwest from the peak in June, 1920. The largest reductions occurred in Minnesota, where loans by banks outside of the Twin Cities declined 6.7 per cent during the four years. In North Dakota and South Dakota, the reductions were 1.0 per cent and .8 per cent, respectively; and in Montana, there was actually an increase of .6 per cent in loans. In other words, the farmer has not lacked credit assistance from commercial banks, and if the increased loans of Federal and Joint Stock Land Banks, Intermediate Credit Banks and other agencies be included, it would undoubtedly prove to be true that the farmers have increased their borrowings for short term and capital requirements during this period.

Farmers adjusting wheat acreage: Further improvement appears to be promised for 1924 due to continued readjustments of crop acreages to improve the cash return from the land. The acreage sown in the four northwestern states to winter wheat and rye has been reduced 19 per cent between the fall of 1922 and this last fall. The figures are as follow (000's omitted):

	Winter Wheat		Rye	
	1923	1922	1923	1922
Minnesota	94	111	730	912
North Dakota..	..	...	1,005	1,288
South Dakota..	90	110	243	304
Montana	810	900	138	192
Four states..	994	1,121	2,116	2,696

The farmer's plan at the present time is undoubtedly to reduce the spring wheat acreage next spring, as well as the acreage sown to winter wheat and rye, and to plant the land which will be released by this action to corn, oats and flax, which have proven the most profitable crops during 1923. The movement to reduce wheat acreages is absolutely sound, especially if yields are to continue small owing to poor methods of cultivation and inability to cope with rust and weeds. However, no pronouncement should be made that bread grain farmers are doomed to failure. If yields per acre can be improved there would be money in raising these grains, because it costs little more to plant and harvest a bumper crop than a lean one.

The flax situation: From all observations, the northwestern farmer is planning a large increase in flax acreage for next spring, following the splendid success of the increase in 1923. The present plans, of course, will be altered somewhat if the course of flax prices between now and planting time is downward; but the price has remained firm in the face of exceptionally large receipts this fall.

The United States consumes on the average 28 million bushels of flax a year, although the annual consumption has been as high as 39 million bushels and as low as 22 million bushels. In 1923 the farmers of the United States produced nearly 17½ million bushels of flax, which is nearly two-thirds of the United States average consumption. If consumption in 1924 is normal, the domestic production of flax could increase 61 per cent without creating the necessity of shipping any flax abroad to compete with the flax produced by other countries.

However, the closer the domestic production approaches the full requirements of the country, the more foreign news will affect the price. It is impossible to predict at planting time what the yield per acre of the flax crop will be and a bumper crop on a large acreage might cause a serious decline in price. Moreover, it cannot be determined ahead of time whether requirements for linseed products will be of average amount during 1924. Consequently, it would be prudent not to increase the acreage devoted to flax to a point where the probabilities would be that the domestic crop would meet the full requirements of the United States.

Between now and planting time the wise farmer will watch not only the price of flax seed in domestic markets, but also business developments, particularly in the building industry, which provides the chief market for linseed oil. Building permits, building material prices and the labor situation are probably the most important factors for him to watch.

Grain receipts at Minneapolis and Duluth-Superior showed seasonal declines, except in oats and corn. There was an unusual increase of one-third in receipts of oats and corn receipts increased three-fourths over November, to 4,953,256 bushels. As a result of the increases in receipts, stocks of corn trebled during December and stocks of oats increased one-seventh. Stocks of the other grains, except flax, changed slightly, there being further increases in the already large stocks of wheat and rye and a slight decline in barley. Flax stocks were reduced more than one-half during the month.

The bread grain situation is particularly important. Although crops were greatly reduced in the United States in 1923 and receipts were correspondingly smaller than in 1922, terminal stocks have mounted to abnormally large figures and the prices of these grains have been seriously reduced. For wheat the explanation of this situation lies partly in the fact that Minneapolis mills have been operating at a very small per cent of capacity this fall, due to a lack of orders. Flour mills in Minneapolis consumed only 25½ million bushels of wheat during the last five months of 1923, as compared with 36⅔ million bushels in the same months of 1922, according to reports received from the Northwestern Miller which we have reduced to bushel equivalents.

The more important reason for the weak position of wheat and rye is the increase in world supplies. Europe, which is the greatest importer of bread grains, is becoming more and more self-supporting. According to the Northwestern Miller, the world's wheat crop (53 countries) has increased from 3,600,000,000 bushels in 1921 to 3,700,000,000 bushels in 1922 and 4,000,000,000 bushels in 1923. As an illustration of the way in which Europe is increasing her domestic grain supplies, eleven central European countries selected from the above list because of the great disruption of their agriculture during the war, produced 301 million bushels of wheat in 1921, 307 million bushels in 1922 and 385 million bushels in 1923, the greatest increases occurring in Roumania and Poland. The rye crop, also, which is of equal importance with wheat in most countries of Europe, has been increasing steadily. The United States Department of Agriculture gives the rye production of the northern hemisphere as 802 million bushels in 1921, 795 million bushels in 1922 and 925 million bushels in 1923. The 1923 production is practically as large as pre-war production, which amounted to 955 million bushels annually. Here, again, Europe's production is becoming more nearly equal to domestic requirements. Nine central European countries produced 304 million bushels of rye in 1921, 333 million bushels in 1922 and 408 million bushels in 1923, with Poland furnishing the larger share of the increase.

The result of these increases in world production has been to create a surplus from the 1923 world crop of 233 million bushels of wheat, according to the statement of the International Institute of Agriculture at Rome, which was quoted in the London Economist of December 8.

Prices of the chief products of the farm at northwestern terminal markets were firm or rising during December, with the exception of corn, which dropped more than 9 cents per bushel in median price to a point as low as the price in the first months of 1923. The other grains all showed small increases in the median price of representative grades and flax seed increased 5 cents per bushel. In the livestock group, the median prices of butcher and feeder cattle continued the seasonal advance begun in November and the price of calves turned upward after the seasonal declines of October and November. Lambs continued the seasonal advance which began in mid-summer. Hogs were slightly higher in price than in November. The hog raiser's position was improved materially by the decline in the price of corn.

Manufacturing in this district continued in large volume, with the exception of flour production at Minneapolis. Shipments of linseed products were as large in December as in November, which is a normal occurrence for linseed cake, but is unusual for linseed oil and is extraordinary in view of the record shipments in November. Shipments of linseed oil, in fact, were the largest December shipments since our record began in 1910.

Lumber manufacturing showed seasonal declines of one-third in lumber cut and one-fifth in shipments. Lumber stocks remained practically unchanged. As compared with a year ago, however, the December cut of lumber was more than twice as large and stocks were one-tenth larger. Shipments, however, were not as large in December as in the same month last year. Lumber manufacturers have 40 per cent more men in the mills and 20 per cent more in the woods this winter than a year ago.

Flour production outside of the cities showed only a 6 per cent decline between November and December and the output was nearly 10 per cent larger than in December last year. In Minneapolis, however, flour production was nearly one-fourth smaller in December than in November, which is partly a seasonal decline, and the output was one-third smaller than in December last year. The Minneapolis December output amounted to 864,000 barrels, which, according to figures received from the Northwestern Miller, was the smallest December figure since our record began in 1910 and there were only four other smaller months in this period.

Banking conditions in this district reflected two movements during December,—a reduction of loans

as a result of heavy marketing of corn and other crops and livestock; and a seasonal demand for hand-to-hand money for Christmas purchases. As the demand for currency exceeded the local loan liquidation, the banks were forced to borrow temporarily from the Federal Reserve Bank. During the first part of January, there was continued liquidation of loans, and the holiday supply of currency was returned to the banks, so that borrowings from the Federal Reserve Bank were reduced.

The balance sheets of selected member banks in the larger cities of this district showed a reduction of seven millions in loans during December and demand deposits decreased nine million dollars. Time deposits and government deposits increased one and one-half millions each and security holdings were increased more than three millions. These banks found it advisable to increase their vault cash one and one-half millions during the month and their borrowings at this Federal Reserve Bank increased nearly two millions. During the first two weeks in January the loans of these banks were further reduced by two and one-third million dollars and demand and time deposits together increased four millions. Securities were sold to the extent of more than two millions, vault cash was reduced one-half million dollars, reserve balances with the Federal Reserve Bank were enlarged by two millions and borrowings from the Federal Reserve Bank were reduced three and one-third millions.

Commercial paper outstanding in this district at the end of December was five per cent more than a month ago and 36 per cent more than a year ago, giving evidence of a greater demand for funds on the part of high grade business houses.

The balance sheet of this Federal Reserve Bank was affected principally by the demand for Christmas shopping currency. Federal reserve notes in circulation increased five and three-quarters millions during the month ending December 26. Deposits also increased one and three-quarters millions. The assets of this bank reflected these changes in demand liabilities: cash reserves increased nearly one million dollars, bills discounted increased one and two-thirds millions and security holdings and purchased bills were enlarged three-fourths of a million dollars. There was also an increase in float. During the three weeks ending January 16, Federal reserve notes were returned to this bank in the amount of four and two-thirds millions dollars, bills discounted declined nearly six millions, deposits were reduced one and three-fourths millions and cash reserves declined one million dollars. As a result of these changes, this bank was enabled to purchase two millions of bankers' acceptances and one and two-thirds millions of United States securities.

The Menace of Weeds to Spring Wheat Raising

(Continued from Page Eight)

At a threshing rate of seven cents per bushel, it is estimated that farmers in Minnesota, North Dakota, South Dakota and Montana paid over $675,000 to thresh the dockage in their 1922 wheat crop.

The enormous sum of almost $800,000 was paid to the transportation companies to haul the dockage of 1922 to Minneapolis and Duluth.

Farmers of the Northwest shipped to Minneapolis mills in the crop year of 1922 over 7,500,000 bushels of dockage, using for this purpose about 5,800 cars.

In 1923 the average dockage in North Dakota wheat was 11.3 per cent, 7.7 per cent in South Dakota, 7.2 per cent in Minnesota and 2.5 per cent in Montana. The total wheat dockage produced in these four states was 7.6 per cent by weight of the 1923 spring crop. This means that 11,650,800 bushels, (on the basis of the preliminary estimate) or the equivalent of 13,980 carloads of dockage, were hauled, by wagons, in the wheat to the country elevators in these states.

The spring wheat farmers in South Dakota, Minnesota and North Dakota who cleaned their wheat before marketing, gained at least 7.3 cents per bushel in 1923 as a result of the cleaning.

There is also much of irony in the dockage situation. Farmers in these four states gave away or wasted enough feed in the form of dockage from the 1923 crop to feed 3,648,300 lambs for market. It takes ten pounds of feed with the nutriment content of the ordinary run of dockage and three pounds of leguminous hay to add one pound to a twenty-five pound lamb, according to an authoritative statement by Dean Coffey of the University of Minnesota, College of Agriculture. If about twenty pounds are put on a lamb in the process of fattening, the state of North Dakota could have fattened 2,241,900 lambs from the 1923 dockage and the required amount of hay. South Dakota could have fattened 650,400 lambs, Montana 307,200 lambs and Minnesota 448,800 lambs. At 12 cents a pound, the present approximate market price, the increase in weight of these lambs could be sold for $875,592, and this sum, less freight and the cost of roughage, is being lost at the present time by selling unclean grain. There is also loss in fertilizer to the grain farmer by allowing the animals to be fed in other parts of the country.

In this, as in any other business enterprise, the equipment should be provided in advance. The feeding of dockage on the farms is especially expedient and should be encouraged where live stock is already being raised, because farmers in those sections have the barns and the knowledge of feeding

rations which is necessary for the greatest success. Lambs were chosen as an illustration because dockage does not need to be ground to be assimilated by them, and the expense of feeding is consequently less. Dockage also makes good feed for cattle, hogs and poultry, but only after grinding.

This dockage loss precludes the possibility of permanent relief for the wheat farmer if he continues to raise weeds instead of wheat and to content himself with a sample grade or a grade of number four or five for his wheat on account of shriveled grain due to weed growth in his fields absorbing the moisture which should belong to the grain plants and to stand a heavy loss from dockage assessments. Here, as in practically every case of a similar sort, the slack methods and incompetence of a number of farmers penalize the other farmers, because no matter how careful a farmer may be with his own field, he cannot protect himself from the encroachment of weed seeds from the surrounding farms. Anyone who has lived on the prairies and has watched tumble weeds blowing across acres of land or has seen the seeds of mustard, French weed, cockle, wild oats and thistles disseminated, will readily understand how hopeless is the situation of one farmer acting alone and how necessary it is for united action on the part of all the farmers in the affected territory to stamp out the weed menace. As always, the promoter is being gouged the most by adversity. The man who has settled temporarily on a piece of land and has tried to hurry the profits out of the ground, without building a sound business of diversified farming is suffering from his own short-sightedness and greed.

The situation, however, is not hopeless. There are several remedies which will have immediate results and will be very effective. The first step is to clean the wheat which has already been grown in order to secure a better grade and a higher price for the wheat sold; and also to have clean seed to plant next spring. Wheat cleaning machines have been perfected which will reduce the amount of foreign material and weed seeds in wheat to less than one per cent of the weight of a bushel and the dockage will be kept on the farms to be used as stock food as illustrated above. Moreover, the machines separate the coarse edible seeds from the fine seeds which are not generally good for stock food.

The second step in the remedy is to clean the road sides and the fence corners of weeds. In many cases a small flock of sheep will be of great assistance in making this thorough, because sheep can graze in locations where it is difficult to mow the weeds down with machinery, and wool also commands a good price. This campaign against weeds might be linked up with the campaign already under way against the barberry bush in the war on rust.

The third part of the remedy is proper management of the soil. This includes proper preparation of the seed bed, judicious selection of crops and care during the growing season. The too general practice of stubbling in a crop with no preparation of the seed bed must be eliminated before any community can hope for success in weed eradication.

In addition to preparing the seed bed, it is often advantageous to plant early maturing or late sown crops on foul ground. Rye or buckwheat can be counted on to mature before many of the weeds are ripe. Sugar cane for fodder, planted heavily with a corn planter can be sown on ground that has been spring fallowed as late as the last week in June, and it will still make an excellent growth before frost. By planting time most of the weed seeds in the top soil have sprouted and are killed, and the remainder will be taken care of by cultivating, and by the heavy rank growth of the canes, which gives the weeds very little room to develop. Corn drilled for fodder ordinarily takes a longer season than sugar cane and must be planted earlier, but the cultivation it requires will kill many weeds and clean the ground if it is not too foul.

In many sections of the Northwest it is advantageous to summer fallow foul ground when it is done properly, for the constant cultivation conserves the soil moisture for succeeding crops, and the increased yield will pay the costs of the summer fallow. If a piece of ground can be cleaned sufficiently to get a stand of one of the legumes, alfalfa preferably, or sweet clover, the heavy growth and the several cuttings of the crop will check the weed growth, while at the same time the bacteria on the roots are building up the nitrogen content of the soil.

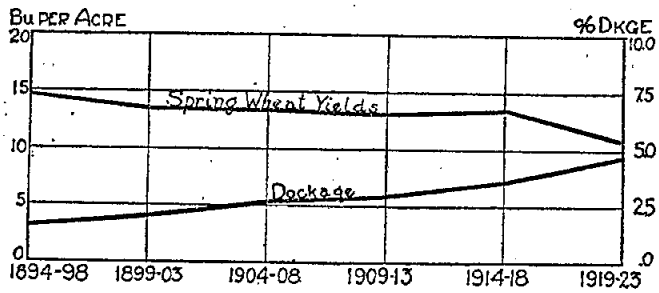
Summarizing the remedies for the extremely unsatisfactory dockage situation, if a farmer plants clean seed in a clean seed bed and has a few sheep to clean out the corners, he will have but few screenings to dispose of when he cleans his grain for market.

The best evidence of the importance of proper tillage is the map shown above. The counties in which corn is a major crop and where the fields are thoroughly cultivated, especially the southeastern counties of South Dakota and the southern counties of Minnesota, had a very small percentage of dockage in 1923. The small dockage in these counties should not be confused with the small dockage in Montana where the low percentage of weed seeds is due more to the fact that the land is new and has not had time to become infested with weeds.

There can be no question as to the accuracy of the dockage figures presented in this map because the method followed by the United States Department of Agriculture in securing the figures has been extremely thorough. Independent reports for each county were received from three different sources; from practically all the elevators in the district, from county agents, and from crop reporters. The various sources of information gave corroborative evidence and where the evidence was conflicting, the situation was resurveyed. The lowest of the estimates from the three sources for each county was chosen.

THE MENACE OF WEEDS TO SPRING WHEAT RAISING

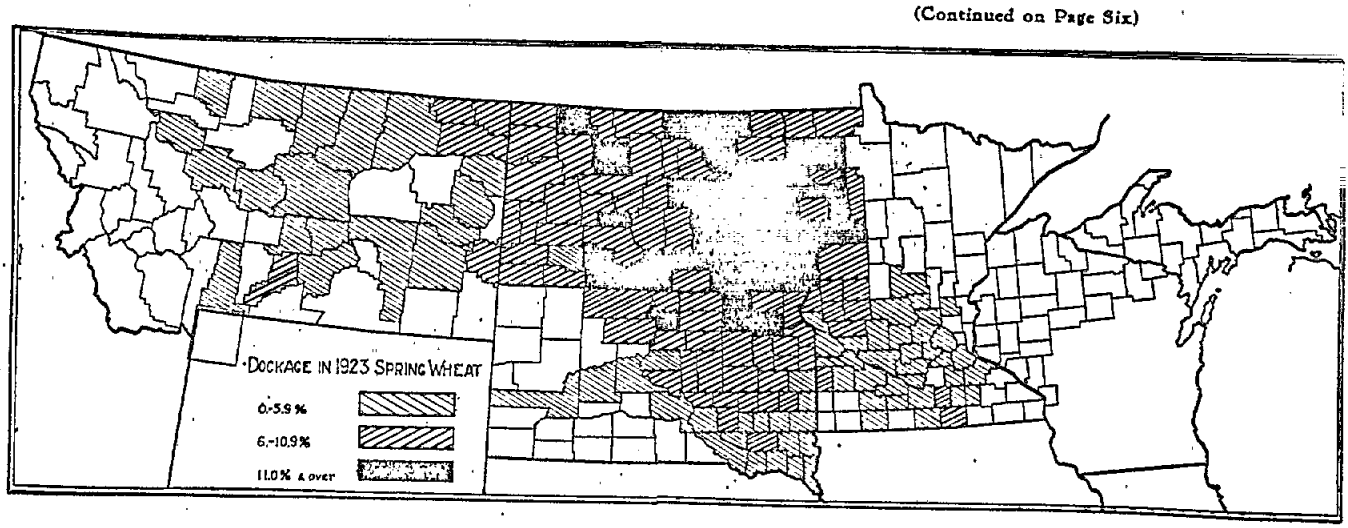
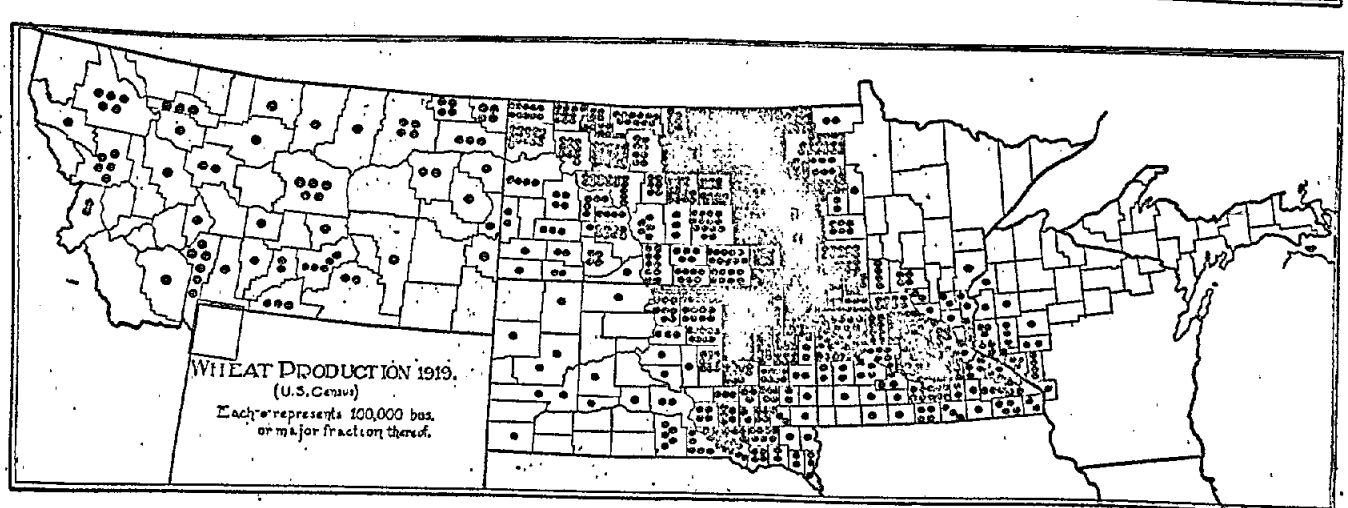
A report has been issued this month by the United States Department of Agriculture correlating the diminishing yields with increasing quantities of weeds in the older spring wheat regions. The accompanying chart shows with telling effect the relation between the two facts. The spring wheat yield per acre has declined steadily from the 90's to the period from 1919 to 1923, with the exception of the war years when much new land was planted and high yields were obtained.



Average yield per acre of spring wheat; and average percentage of "dockage" in spring wheat receipts at Minnesota terminals. Averages as for five-year periods.

The curve for dockage in this same chart h climbed steadily to a menacing figure, with the co tinued use of wheat land for one crop farming an the lack of proper cultivation to eradicate weed The dockage figures charted are the records of sprin wheat received at Minneapolis and Duluth. Th wheat is frequently cleaned by country elevators an the figures are, therefore, somewhat less than th true farm dockage figures.

The dockage situation in 1923 is shown graphica ly in the accompanying map. The counties whic appear black on the map are counties in which th dockage for the 1923 spring wheat crop amounte on the average to 11 per cent or more per bush of wheat marketed, and in some counties the averag dockage was as high as 18 per cent. A compariso of the dockage map and another showing the are in which spring wheat is grown, shows that the dock age situation is most serious where spring wheat i the principal crop.

Other striking estimates contained in the Unite States Department of Agriculture bulletin are give below:

(Continued on Page Six)