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# Wheat and Flax Prices Received by Farmers in North Central and North Eastern South Dakota, 1890 - 1940

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# Wheat and Flax Prices Received by Farmers in North Central and North Eastern South Dakota, 1890-1940



Fig. 1. Area of study of wheat and flax prices.

Agricultural Economics Department  
AGRICULTURAL EXPERIMENT STATION  
South Dakota State College  
Brookings, South Dakota

## Introductory Note

This circular is the first of a series intended to present in a simple and objective manner the prices farmers have received for their more important products over a 50-year period, the crop years of 1890 through 1939. An interpretation of the significance of the price data will also be presented.

The purpose in issuing this series of circulars is threefold:

- (1) To supply agricultural planning groups with price data, because agricultural planning, be it local, state or federal, should profit from a long-time knowledge of the prices of principal livestock and grain crops by areas.
- (2) To analyze briefly these price data and show their effects upon the South Dakota farmer.
- (3) To aid the farmer in deciding whether to store or sell cash grain crops at harvest time.

It is hoped that by the presentation of these facts action agencies and planning groups will be better equipped to study and analyze the price problems confronting the farmer and arrive at a satisfactory solution to those problems.

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## Summary

This circular presents an analysis of the wheat and flax prices received by farmers in the north central and north eastern counties of South Dakota during the last half century. The following statements summarize the material of this report.

1. Wheat and flax are important cash crops to the South Dakota farmer; wheat alone provided him with one-eighth of his total income during the 1929-38 decade.
2. An important feature of wheat and flax prices in South Dakota has been their extreme range and variability.
  - a. Wheat prices in the wheat area have fluctuated from a low annual average of 39 cents to a high of \$2.50 per bushel.
  - b. Annual average flax prices in the flax area have ranged from less than 55 cents to more than \$4.32 per bushel.
  - c. In seven out of every 10 years studied, the South Dakota price of wheat has been less than \$1; during one-third of this period it has been less than 70 cents. The price of flax has fluctuated mainly between the limits of \$1 and \$2, but it was less than \$1 in 20 percent of the years and over \$2 in 25 percent of the years.
3. Taking the full 50-year period the trend of wheat and flax prices has been upward, but the rise has not been as pronounced or sustained as the rise in industrial price levels.
4. In the case of neither wheat nor flax does the seasonal price appear large enough to justify increased storage operations by farmers if this involves building additional storage capacity. Where finances and existing storage capacity permit, however, it may prove profitable to hold these grains for several months (normally about five) and then sell at a seasonally higher price.
5. Per acre income figures indicate that there was no appreciable difference in the earning capacity of wheat and flax in those areas of South Dakota which produce both.
6. The principal factors to be watched in estimating the wheat price outlook (aside from government programs) are world production and carryover. In the case of flax the industrial demand for linseed oil and flaxseed imports from the Argentine are significant.

# Wheat and Flax Prices Received by Farmers in North Central and North Eastern South Dakota, 1890-1940

By Weber H. Peterson\*

## *Part I—Wheat Prices*

### Introduction

The buying power of the South Dakota farmer is immensely important to all people of this state since this is primarily an agricultural area. The farmer's buying power is determined by the price he receives for his commodities as well as by the quantities he sells and the price he must pay for the goods he consumes and uses in his farming operations. The dollars which come to the farmer in exchange for his products are therefore important not only to him but also to many others.

Over a 57-year period, 1882-1938, South Dakota wheat production averaged 30.8 million bushels annually, making an annual average farm value of \$26,600,000. During the decade from 1929 through 1938, 12.5 percent of the total income received by the farmers of this state was due to their wheat income. In other words \$1 out of every \$8 of the average South Dakota farmer's income came from his wheat crop.

The 11 counties included in this wheat study (see Fig. 1) were chosen on the basis of their records of large spring wheat production from 1924 to the present.<sup>1</sup> They have produced approximately 50 percent of the spring wheat in South Dakota since 1924. The sources of data included in this study are the various county grain price pamphlets compiled by the Department of Agricultural Economics of the South Dakota Agricultural Experiment Station with the cooperation of the Work Projects Administration.<sup>2</sup>

\* Assistant Economist, South Dakota Agricultural Experiment Station. The author wishes to express his appreciation to those members of the South Dakota Experiment Station staff who contributed their helpful criticisms and suggestions so willingly; credit is especially due Assistant Economist Smythe, and other members of the Agricultural Economics Department for their careful scrutiny of the publication. The Work Projects Administration, represented by Dr. R. L. Woolbert, assisted considerably in working up the original data on which this publication is based; D. C. Myrick and Everett Peterson, members of the Bureau of Agricultural Economics, furnished freight rate differentials and also basic data for which the author is indebted to them.

1. Corson county was a more important wheat producing county in recent years than several of the counties used in this study; however, price data prior to 1906 were not available for this county. Hence, it was not included in the study.

2. The actual price data by counties, method of computation of prices, etc., on which the data of this publication are based, are to be published as pamphlets designated as the County Pamphlet Series in Agricultural Economics. Any one desirous of obtaining this additional information can obtain it by writing to the Agricultural Economics Department, South Dakota State College, Brookings, South Dakota.

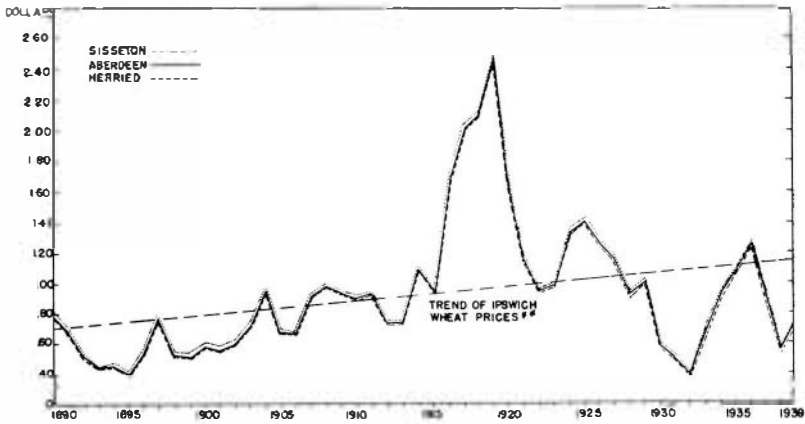


Fig. 2. Variability of average annual weighted wheat prices by towns, 1890, 1939.\*  
 \* Data for the other eight towns for which price data have been assembled would be very similar to the above picture. Hence, line graphs for those were omitted.  
 † Ipswich was chosen for the trend line since the other towns would have had a similar trend line and Ipswich was thought to be the most representative.

### Analysis and Presentation of Data

Variability of Wheat Price by Counties. Fluctuation in wheat prices in general, as well as for the above defined wheat area, has been the cause of severe economic disturbances for the wheat farmers. The rather wide spread of wheat prices for South Dakota's wheat area is illustrated in Table 1 and Fig. 2. The range of prices has been from a low of 39 cents in 1932 (weighted crop year average price) to a high of \$2.50 in 1919, a difference of more than 500 percent.<sup>3</sup>

It is interesting to note the distribution of wheat prices during the crop years 1890 through 1939. In almost 10 percent of the years the weighted av-

3. Henceforth the word price as used herein will carry the added meaning of weighted average price for the crop year. The price that is quoted refers to No. 1 Northern Spring Wheat and No. 1 Flax.

Table 1. Area Wheat Prices by Towns, 1890-1939

Avg. Annual Price*	Aberdeen		Britton		Faulkton		Gettysburg		Herried		Ipswich		Leola		Redfield		Sells		Sisseton		Wadena	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under .50	4	8.0	4	8.0	5	10.0	6	12.0	6	12.0	4	8.0	4	8.0	4	8.0	6	12.0	4	8.0	4	8.0
.50-.699	13	26.0	13	26.0	12	24.0	12	24.0	14	28.0	14	28.0	13	26.0	13	26.0	12	24.0	11	22.0	13	26.0
.70-.899	7	14.0	7	14.0	8	16.0	8	16.0	5	10.0	7	14.0	7	14.0	7	14.0	8	16.0	9	18.0	7	14.0
.90-1.099	15	30.0	14	28.0	14	28.0	13	26.0	14	28.0	14	28.0	15	30.0	14	28.0	13	26.0	14	28.0	14	28.0
1.10-1.99	8	16.0	9	18.0	8	16.0	8	16.0	8	16.0	8	16.0	8	16.0	9	18.0	8	16.0	9	18.0	9	18.0
2.00 & over	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0	3	6.0

\* These prices are weighted averages of the actual average monthly prices. The weights used were those determined in a previous study by the Agricultural Economics Department of South Dakota State College.

† The word number is used here to mean the degree of frequency that the price was within each of these arbitrarily chosen class intervals; i. e., the number 4 under Aberdeen indicates that there were 4 years out of the 50-year period, 1890-1939, that the average annual wheat price was less than 50 cents. The percentage column indicates the percentage frequency of recurrence of these numbers within each class interval.

average monthly wheat price received by the farmer was less than 50 cents for the eleven-county wheat area of the state. The price of wheat in this area was under 70 cents more than one-third of the years. The price of wheat was more than 90 cents one-half of the years in this area; however, the price the farmer received for his wheat was higher than \$1 only 30 percent of the time. This should help dispel any mistaken belief that "dollar wheat" is the "normal thing," since during the last half century seven out of every 10 years had a wheat price of less than \$1. A simple average of the weighted monthly prices for this wheat area is 92.8 cents per bushel. Since the prices do not follow any definitely normal pattern it is inaccurate to refer to some such price as being average.

**Averages of Prices by Significant Periods.** In the above section mention was made of the fact that the wheat price data were so irregular in nature that no one price could be referred to as a truly representative average of these data. Perhaps it would be well to examine these price data more minutely, breaking the data down into specific periods to ascertain more reliable and representative averages.

During the 1930-39 decade the average weighted crop-year price for the wheat area was 76 cents per bushel (see Fig. 3). However, if the yearly average weighted prices were also weighted by the annual wheat production the average price would probably be even lower; the reason behind this statement being that during those years when production was especially large, the average price was low and since the volume of production was large this method of weighting would give greater weight to low prices than the small volume of production would give to the high prices. There were only two years during this period when the price per bushel of wheat was over \$1, in 1935 and 1936 when the drought and grasshoppers reduced the total crop.

The price of wheat during the so-called "prosperous 20's" was very favorable for the wheat farmer of South Dakota's wheat area; the average price per bushel during this decade being \$1.19, ranging between 90 cents and \$1.69. During six of those 10 years the price was more than \$1.10 per bushel. The only ten year period that surpassed the 20's as far as wheat prices were

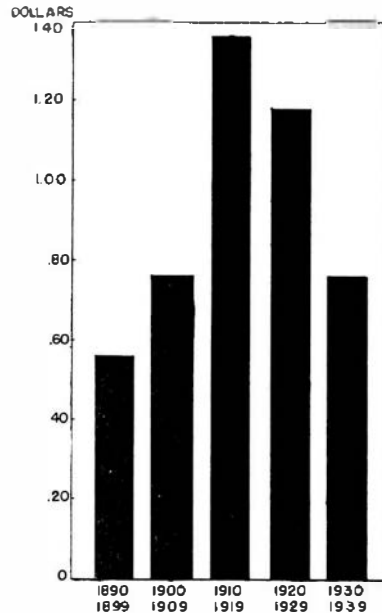


Fig. 3. Wheat prices by decades for wheat area.



concerned was the 1910-19 decade when the World War made prices skyrocket to the abnormal heights of \$2 per bushel. The average weighted price per bushel during this decade was \$1.37, almost twice as high as during the 30's.

The other two decades, 1890-99 and 1900-09 had much lower wheat prices, the prices being 56 cents and 76 cents, respectively. However, the price the farmer had to pay for goods used in his farming operations was also lower.

What significance do these fluctuating prices have for the South Dakota wheat farmer? It is certain that these fluctuating prices have contributed to the lack of agricultural stability in the state. The South Dakota wheat farmer might well take into consideration the variability of his wheat prices in setting up his farm plans; that is, to make his farm organization flexible enough for him to adjust his farming operations in such a manner as to enable him to survive the economic shock of changing wheat prices.

Another problem confronting the South Dakota farmer as a result of fluctuating prices is the temptation to expand farming operations on borrowed funds during periods of high prices; such expansion took place during the World War I and was the cause of subsequent heavy mortgage foreclosures in the wheat areas of north central South Dakota and elsewhere. This is something the wheat farmer of today may wish to guard against.

**Trend of Wheat Prices for the Area.** The trend of wheat prices received by the farmers in the wheat area has been upward during the past half century (see Fig. 2). In spite of this upward trend, however, the South Dakota farmer was still not receiving a parity price for his wheat during the latter part of this period because price levels as a whole have moved in the same general upward direction but have risen more rapidly and to higher levels than agricultural prices. Hence this figure should not be misinterpreted—it merely indicates that the trend of wheat prices has been ascending during the last fifty years but not as rapidly as industrial price levels. The trend line as used here does not necessarily forecast a continued rise in the wheat price level: there are many other factors that will affect these prices perhaps even in a downward direction.

**Seasonality of Wheat Prices for the Area.** The time to sell wheat is a practical question confronting the wheat farmer each year. There usually are certain months during any given year when the price the farmer will receive for his wheat is higher than it is at other times; or, in other words, there are certain seasonal periods when prices are low, others when they are medium and still others when the prices tend to be high.

The average seasonal distribution of prices for wheat in the South Dakota wheat area are presented in Fig. 4. During the month of November the seasonal price index of wheat is at its lowest position, 92.8 percent. The highest seasonal price index is during the month of May when it is 105. Simplified, these figures mean that if the average yearly price for wheat was 90 cents, the November price would normally be 92.8 percent of 90 cents, or 83.5 cents and the May price would be 94.4 cents; this would mean a difference of 11 cents per bushel, normally, between the seasonal high and low. If the average annual price of wheat was higher, say \$1.50, then there would be a still wider

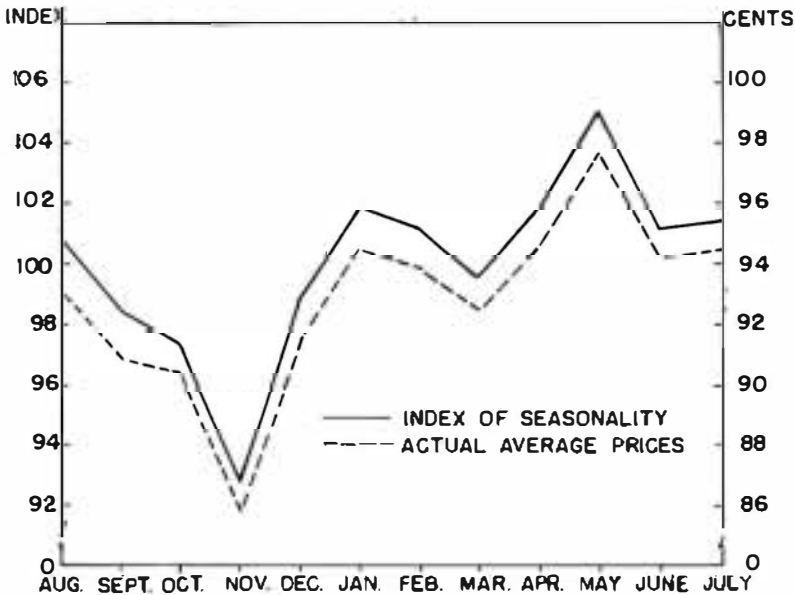


Fig. 4. Index of seasonality of wheat prices for wheat area.\*

\* This index was determined for Ipswich only since the other stations have followed the same general pattern.

spread between the low and high seasonal price periods; in this case the May price would normally be about 18 cents higher than the November price of the previous fall. Most farmers would probably find the cost of storage and handling during the five months from November to May to be as large as the differential in seasonal prices; hence for those farmers it would not pay to store their wheat until May, unless they had unused storage space on their own farm.

The average weighted monthly prices tended to conform to the same general pattern as the price index of seasonality (see Fig. 4). The lowest average monthly price occurred during November when it was down to 86 cents, whereas the May price was 98 cents; in this case the actual difference per bushel was 12 cents. However, actual price figures themselves do not portray the true seasonality of prices because the trend factor inherent in the data is not removed nor do they show the actual consistency of higher prices in one month as compared with another.

### Factors Affecting Wheat Prices During This Period

It scarcely needs be said that the ability to make an intelligent estimate of the future course of prices is exceedingly important to the farmer. He wants to know by planting time how to make his plans to bring him in the highest returns. At harvest time he wants to know whether to store or sell. When buying land or equipment he must do so in the expectation that future prices will

make his investment worth while. Fortunately, the Outlook reports have a good record of accuracy, as shown by careful comparison of their predictions with subsequent events. Nevertheless, some discussion of major price making factors is in order.

Using the familiar division into factors of supply and demand, the demand situation may be considered first. Domestic demand is fairly stable, although there has been in recent years a slow but steady decline in the per capita consumption of wheat, not altogether offset by the increase in population. The fact that consumption does not respond by increasing and decreasing readily as the price changes is very unsettling to the price situation. It has been found that a one percent change in price brings about a change in consumption of only approximately 0.08 of one percent, and vice versa. This means that the price change is proportionately very much greater than the change in consumption, which accounts for the fact that a large United States wheat crop brings in less money than a small one. However, a considerable part of the demand for wheat lies in the export market, so that if a large crop in this country comes in a year when small crops in foreign countries have to be made up by large imports from the United States the domestic price will not break unduly. Consequently, information about foreign carryovers and crop production, as well as foreign tariffs, quotas, preferences, etc., can repay careful study. It may be observed, too, that in recent years almost as much wheat has been exported by Southern hemisphere countries as by Northern hemisphere countries. Since the seasons are reversed in the Southern hemisphere, estimates of the crop there become available in time to have some influence on spring planting in this country.

In the older countries wheat does not occupy quite the same eminent position among food grains that it does in North America. As a result, the size of European rye and other grain crops may be an important factor in the export demand for American wheat.

As for the supply of wheat, of course the amount of grain available for sale is equal to production plus carryover. *The Wheat Situation*, published by the United States Department of Agriculture, carries running estimates of the probable size of both carryover and production.

Carryover, of course, is not only largely related to the size of the previous year's crop, but also to the volume of sales, and particularly to export sales since they are more variable. In recent years the size of the carryover has had a close relation to the loan value. The higher the loan value the higher the carryover tends to be. If the loan value is set too high in any one year it supports the price in that year at the expense of building up a carryover which has a price depressing influence the following year. This can be overcome by subsidized exports (provided foreign countries do not counter the subsidies with tariffs) and by acreage reductions in the following year.

Production is a matter of acreage and yield, with yield influenced by weather, disease, and infestation. Under the Agricultural Adjustment program acreage in this country has been subject to a certain amount of control. On the other hand, it has been possible for foreign countries to expand produc-

tion at the same time the United States has been contracting, so that much of the advantage of crop reduction has accrued to them and not to us.

Meanwhile, the long term prospect for wheat is very much beclouded by the war situation. Blockaded countries may very well be disinclined to reestablish a dependence on water-borne food supplies unless a just peace and a very strong and trustworthy organization for the prevention of future wars can be established. On the other hand, the prospect of an industrialized Latin America with a purposely complementary economy might improve the situation somewhat by increasing their home consumption of wheat. Changes in dietary habits will probably continue with a shift away from wheat and toward fruit and vegetables. Against this may be set the prospects of increased population in North America with Canada absorbing an increasing proportion of its own wheat crop. It also seems possible that Latin America may shift to the use of more wheat in its diet as we move in the other direction.

## *Part II—Flax Prices*

More flax was imported into the United States during the years between 1921 and 1939 than was produced in this country. The average annual production of flax in the United States during this period was 14.4 million bushels while on an average more than 17.5 million bushels were annually being imported; this means that United States' flax production was almost 20 percent less than the imports.

Needless to say flax is not as important a cash crop to the average farmer of South Dakota as is wheat. However, the average annual income derived from the production of flax in this state from 1924 through 1939 was about \$3,500,000. In the year 1927, flax brought an income of almost \$10,000,000 to its producers in this state; however, in 1932 flax produced less than \$650,000 of income for the flax farmers. During these same years the United States has been paying more than \$30,000,000 annually for flaxseed imported from other countries.

The main flax area of the state is the eight northeastern counties (see Fig. 1). This region has annually produced on the average almost 40 percent of South Dakota's flax from 1924 through 1940. In the more recent years (1937 through 1940) this area has produced about 80 percent of the flax produced in South Dakota.

## **Analysis and Presentation of Data**

**Variability of Flax Prices by Counties.** By examining Fig. 5 one can see the extreme variability of flax prices within the flax area of South Dakota from 1890 to 1940. The average weighted crop-year prices of flax ranged from less than 55 cents at Watertown during the 1896 crop year to a high of \$4.33 in Brookings for the crop year of 1919; this is a spread of almost 800 percent. The main characteristic of the flax prices during this 50-year period was their fluctuating nature; at no period of time during that era did the flax prices maintain a fair degree of stability.

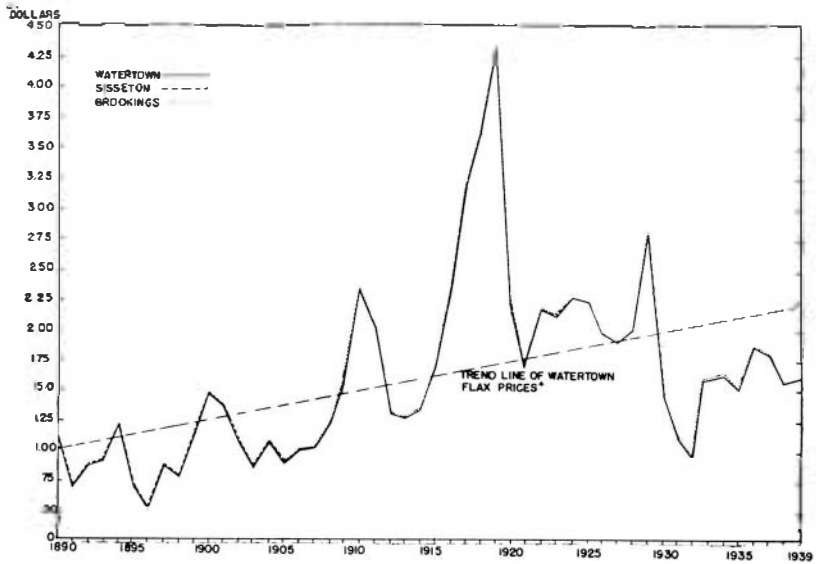


Fig. 5. Annual weighted flax prices in flax area of South Dakota.

\* Watertown price data were chosen to depict the trend of flax prices because it was thought that these would represent the general trend over this 50-year period in a more representative way than the prices for any of the other towns of the flax area. A trend line for prices in any of the other towns in the flax area would be very similar to this one.

Other evidence of the variability of flax prices in the flax area is contained in Table 2. Slightly more than 20 percent of the average yearly weighted flax prices were below \$1; more than 50 percent of these prices were between \$1 and \$2. Approximately one-fourth of the flax prices between 1890 and 1940 for this flax area were above \$2; however, only 6 percent of the latter 25 percent (i.e., 1½ percent of all prices) were above \$3. This all indicates that the great majority of flax prices during this 50-year period was less than \$2; the simple arithmetical average of the weighted crop-year flax prices over this period was \$1.61; however, due to the fluctuating nature of these prices it does not mean much to think of an average price as being typical.

Since these flax prices do not tend to follow any regular pattern, the South Dakota farmer should take account of this fact in his farming operations in

Table 2. Average Weighted Crop Year Flax Prices by Towns, 1890-1939.

Average Annual Prices Total	Britton*		Brookings		Clear Lake		Hayri		Milbank		Sisseton		Watertown		Webster	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under \$1.00	10	20	10	20	10	20	10	20	10	20	10	20	10	20	11	22
\$1.00-1.99	28	56	27	54	27	54	27	54	27	54	27	54	27	54	27	54
\$2.00-2.99	9	18	10	20	10	20	10	20	10	20	10	20	10	20	9	18
\$3.00-3.99	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
\$4.00 over	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2

\* For meaning of No. and percentage see footnote in Table 1.

such a manner as to be best able to survive the shocks of these widely fluctuating flax prices. This will necessitate the maintaining of a sufficiently flexible individual farm program to enable the operator to increase or decrease his flax acreage depending upon prevailing and prospective conditions.

**Averages of Prices by Significant Periods.** A simple average of the weighted crop-year flax prices for the flax area was given in the above section as being \$1.61; it was also stated that this average was not representative of its data. Hence, let us examine more carefully significant price periods during this half-century.

From Fig. 6 one can readily see that the flax price during the decade 1910-19 was the highest ten-year average of the fifty year period. The average price during this period was \$2.35 per bushel. The following decade, 1920-29, ranked second with an average annual price of \$2.15 per bushel. During the depression thirties the average price of flax had fallen to \$1.51 per bushel; however, in the decades of the 1890's and 1900's the price for flax in this area was even less, averaging 88 cents and \$1.16 respectively. Certainly these additional facts would substantiate the statement that there is little logic in speaking of one price as being the average for flax. Indeed, one can probably conclude that \$2.00 flax is more "mythical" than real for the flax area of South Dakota. In only one out of every four years during the past 50 has the average annual flax price been \$2 or above.

**Trend of Flax Prices for Flax Area.** The trend of agricultural prices as a whole has been in an upward direction since 1890; the price of flax has followed the same general movement as the trend line of the Watertown flax price in Fig. 5. However, the increasing price the South Dakota farmer has received for his flax has not kept up with the increasing cost of the goods he has had to buy; hence, flax prices are and have been at a disparity, as was also pointed out for the prices of wheat. Nevertheless, it is interesting to note that the general movement of flax prices has (as have other farm prices also) been in an upward direction since 1890, even though the exceptionally high prices of the World War era be omitted. The price of flax in South Dakota fell off in 1930, 1931, and 1932, but since then it has been increasing and will probably continue to do so as long as the world emergency continues to exist and as long as we have to import flax into the United States and have a high import tariff, or high ocean freight rates.

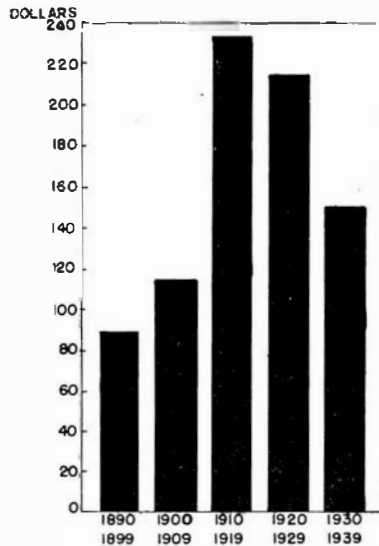


Fig. 6. Flax prices by decades for flax area.

**Seasonality of Flax Prices for the Flax Area.** The price of flax does not have as distinct a tendency to follow a seasonal pattern as does the price of wheat. In other words the price of flax tends to remain more stable throughout the year than the price of wheat. The index of seasonality for wheat (see Fig. 3) ranged between the limits of 92.8 percent and 105 percent; that for flax (see Fig. 7) ranges between a low of 96.1 percent to a high of 102.9 percent.

The low point for the price of flax in the flax area of South Dakota normally comes during the month of October, according to the data of this study. The farmer receives his highest price during April, although March and May bring him almost as high a price for his flax. To illustrate what is meant by this index of seasonality for flax, let us assume the average price of flax for some year such as 1940 was \$1.50 per bushel. This would mean that normally the price the farmer would receive for his flax when the heaviest marketings take place in October would be about \$1.44. If the farmer waited until April of the following year to sell his flax he would normally have received \$1.54 per bushel; this would have meant an additional 10 cents per bushel for his flax. However, the normal carrying charges from October to April would also be about 10 cents; hence, unless a farmer had unused storage space on his own farm, and did not need to sell in order to pay interest bearing debts, it would probably not be profitable in the long run to attempt to hold his flax until

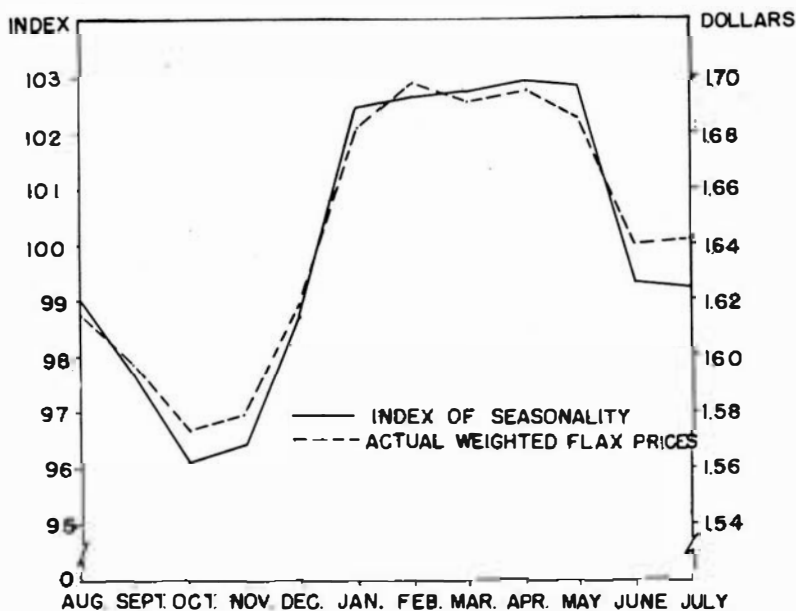


Fig. 7. Index of seasonality of flax prices for flax area.\*

\* Watertown was chosen to represent the flax area because it was thought to be the most representative, and prices at other towns in this area would have an index of seasonality almost identical to that from this town.

April. Most farmers have found it to be wisest to consistently follow the policy of selling the flax when harvested or to consistently hold it over for the normal seasonal increase in price, providing they had sufficient unused storage space of their own. This latter policy would almost necessitate an effective loan storage program similar to the corn or wheat loan programs of today for farmers who lack capital.

**Wheat and Flax Prices Compared.** Both wheat and flax are somewhat similar crops for the South Dakota farmer in view of the fact that they are mainly cash crops. As has already been pointed out, the South Dakota farmer has increased his wheat acreage more than his flax acreage. This brings up the question, "Did the South Dakota farmer do the most profitable thing from the standpoint of increased income by expanding his wheat acreage at the expense of flax?"

In order to arrive at an answer to this question let us examine some price and production data. In Table 1 the wheat prices for the wheat area have been summarized. This table shows that almost 70 percent of the wheat prices during the 50-year period, 1890-1940, were less than \$1 per bushel; only 6 percent of the wheat prices were \$2 or over. On the other hand only 20 percent of the flax prices, as shown by Table 2, were less than \$1, while slightly over 54 percent were between \$1 and \$2 and more than 25 percent were over \$2. As has been pointed out previously the simple average weighted crop-year price per bushel for flax was \$1.61 while for wheat it was only 93 cents; this means that on the average the flax prices were almost 75 percent higher annually per bushel than the wheat prices during this last half century.

"Since production costs per acre of flax and wheat are approximately the same," it will be necessary to examine yield data before arriving at a more definite answer to the above question.<sup>4</sup> The average annual wheat yield per harvested acre in the three eastern counties of the wheat area (Roberts, Day and Marshall) from 1928 through 1940 was 10.1 bushels; the flax yield for the same counties was only 5.8 bushels per harvested acre.<sup>5</sup> During the same period of time the flax acreage abandonment for this similar portion of the wheat and flax areas of South Dakota was almost identical with that for wheat, slightly over 22 percent.

By using the above-quoted prices and yield averages for flax and wheat, one comes out with a gross income per acre for wheat (in this three-county area) of \$9.42 and for flax of \$9.34.<sup>6</sup> These figures would tend to indicate that there was no appreciable difference in the earning capacity of wheat and flax as far as the wheat and flax areas of South Dakota are concerned. However, the ef-

4. Flax Facts, U.S.D.A. Cooperative publication with the Agricultural Extension Divisions of the University of Minnesota, Montana State College, North Dakota Agricultural College and South Dakota State College. pp. 3 and 4.

5. Roberts, Day and Marshall counties were chosen because they are the only counties that are in both the wheat and flax areas of South Dakota (See Fig. 1). By choosing these three counties for the above comparisons, climatic and physical factors are held relatively comparable.

6. Since costs of production per acre for flax and wheat are approximately the same, it would not be necessary to compute net income figures for the two crops in order to compare their profitability.



fective tariff on flax has been an important factor in keeping flax prices well above those for wheat; on the other hand the United States tariff on wheat has proved to be ineffective since we are a wheat exporting country.

The above figures tend to indicate that as far as income is concerned it has been a matter of indifference during this period of time whether the farmers in the area studied produced flax or wheat.

### Some Factors Affecting Flax Prices

The flax crop in the United States has been grown almost exclusively for the seed, which is used for the production of linseed oil and its by-product, linseed cake. Linseed oil is an excellent drying oil for use in paints, and its only strong competitor is Tung oil which is only beginning to be produced on any significant scale domestically. Soybean oil, a semi-drying oil, competes also to some extent, and the supply of these two oils may have a growing effect on the price of flax in the future. Soybean cake also competes with linseed cake, as does cottonseed cake to an extent somewhat limited by the cost of transportation. Research in the chemistry of fats and oils has been making fast progress in the last few years. As more is learned about the process of modifying the properties of oils it becomes easier to substitute one for another. This means that in future years the price of flax may come to depend more closely on the size of cotton and peanut crops. It means also that extremely high or low swings of linseed oil prices will be less probable.

Commercial utilization of flax straw is extremely limited on account of transportation costs. Even a concentrated growing area would be capable of supporting only a small scale industry, and concentration is checked by the nature of the crop rotation necessary in growing flax. There may be attempts to use the fibre for low grade twines during the time the Pacific war interrupts the receipt of manila, hemp and jute. Paper making could provide an outlet for flax straw, but the price of paper is not high enough to permit much margin between the handling cost and the price of the straw. A limited quantity can be used for upholstering material.

For the immediately foreseeable future, therefore, the principal set of demand factors relates to the oilseed market. Current information is published regularly by the U. S. Department of Agriculture in *The Fats and Oils Situation*. A good rough guide to the expected trend in prices might be the Federal Reserve Board's *Index of Industrial Production*, carried periodically in the financial pages of most newspapers. This not only gives an indication of the trend of industrial demand, but also is related to the trend in the purchasing power of urban wage earners.

Only about half of our supply of flax seed has been produced domestically. The principal foreign supplier has been Argentina. The flax seed price in Argentina in recent times has been set by the official Argentine Grain Board. A major factor in supporting the domestic price has been a substantial tariff. This was recently cut in half, but still remains 32.5 cents per bushel. Transportation charges afford additional protection. In fact, war time increased ocean freight rates and pressure on shipping space prevented the reduction in tariff from showing any immediate effect on the United States market.