

# MONTHLY REVIEW

## *Agricultural and Business Conditions*

### TENTH FEDERAL RESERVE DISTRICT

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FEDERAL RESERVE BANK OF KANSAS CITY

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#### WIND EROSION OF SOIL\*

**Occurrence** Soils are subject to erosion by wind in any area where rainfall is deficient, crops fail to grow, tillage practices and the natural action of rain and temperature have pulverized the surface soil, and where winds of relatively high velocity prevail during certain seasons of the year. With the exception of mountainous areas, this combination of weather, crop, and soil conditions has, at various times, existed to some degree in practically every section of the Tenth District. Thus, soil blowing may be considered a problem common to the entire area, although it varies in intensity from one of negligible proportions in the eastern section to one of major importance throughout the western two thirds of the District.

By virtue of an average annual rainfall of about 30 inches in the eastern one third of Nebraska, Kansas, and Oklahoma, the conditions conducive to soil blowing develop less frequently and extensively there than in the western areas of the District where the average annual rainfall ranges from 15 to 20 inches. There are, however, several areas of light, sandy cropland in eastern Oklahoma that are subject to serious wind erosion in spite of their location in a region of relatively high rainfall. Many of the light, sandy soils in south central Nebraska, central Kansas, and north central Oklahoma are also inclined to blow in periods when rainfall is sharply below normal.

The section of the District in which wind erosion of the soil is an almost constant hazard extends eastward from the Rocky Mountains in Wyoming, Colorado, and New Mexico into the western two thirds of Nebraska, Kansas, and Oklahoma. It is in this region that combating wind erosion is of paramount importance in the farming systems applied to the land. In this analysis, this region will hereafter be referred to as the Plains.

**Causes** Obviously, the principal cause of soil blowing in the Plains is insufficient rainfall during a crop year or over a series of crop years. There are, however, several contributing causes and it is

these that must receive attention and be corrected if a sound agricultural program is to be developed and maintained. Little can be accomplished toward correcting deficient rainfall. There is, on the other hand, much that remains to be done in adapting land use and cultivation practices to the climate of the area.

Being unaware of the weather characteristics of the Plains, the early settlers employed essentially the same cropping systems and tillage techniques that they used in the more humid agricultural sections of the east. Although these methods proved inadequate to cope with the recurring periods of dry weather, tradition has extended their use through the years. There are yet large acreages of cropland in the area that are farmed under cropping systems developed over a half century ago.

It is evident today that much of the land broken from sod prior to 1900 and during World War I should have been left permanently in grass. Such land is now classified as marginal or high risk cropland. Some persons fear that the increased use of these soils in the favorable crop years since 1940 will eventually cause a repetition of soil blowing comparable to that which occurred in the area from 1934 to 1937. Others consider such a possibility to be rather remote in view of present day knowledge of the factors responsible for soil blowing.

What appears to be rather significant progress has been made since 1930 in the development of land use practices and tillage techniques designed to meet the weather hazards of the Plains. If a drought of major proportions should occur, these improved measures would doubtless be considerably more effective in dealing with the problem of wind erosion than were the methods available in the 1930's. Whether or not these improved techniques are sufficient in themselves to prevent widespread wind erosion must finally be determined by actual test. There is no conclusive information that would yield a positive answer to this

\* This article is the second in a series on Soil Conservation and presents in some detail one important phase of that general subject. The first article, "Soil Conservation," was introductory in nature and appeared in the January 31, 1948, issue of the Monthly Review.

question. Nevertheless, wind erosion appears likely to remain as one of the chronic hazards of agriculture in the area because of the close relationship of rainfall to crop production. Inadequate rainfall invariably results in crop failures which in turn leave the soil exposed to the powerful eroding force of the wind.

**Land Use** The proper use of land is basic to sound farming anywhere. Proper land use is established by studying the physical and chemical make-up of the soils in a given area and, in consideration of climate, location of market, labor and feed supplies, and other factors, determining the kinds of crops or livestock, or a combination thereof, that the land is best suited to produce. In a general way, experiment and practical experience have now established that many of the light, sandy soils found in southwestern Kansas, western Nebraska and Oklahoma, and eastern Colorado are best adapted to livestock production. Proper land use principles dictate that these soils should remain in native grass or, if now under cultivation, be reseeded to tame grass. The continued or expanded use of these soils for grain production is the most vulnerable point in the defense against wind erosion. Yet, throughout the Great Plains states in the crop year 1946-1947 over a million acres of grassland and other stabilized land were broken for cultivation, principally in Kansas, Colorado, Montana, and North Dakota. This, however, is not a net figure, as large areas of submarginal cropland have been reseeded to grass in recent years.

The use of corn in cropping systems was a common practice in the area until comparatively recent years. It has since been determined that, except in a few isolated localities, corn is not generally adapted to the climate of the dry land sections of the Plains. Sorghums have largely replaced corn in the area and have become established as a more productive and certain crop for either grain or fodder. They are drought resistant, fit well into a crop rotation requiring a row crop, and are almost equal to corn in value as a livestock feed.

Notable progress has been made in recent years in bringing about such changes in land use practices, although much remains to be accomplished. Clearly, many of the soils in the area are adapted to wheat production and thus should remain under a proper system of wheat farming. However, there is evidence to indicate that, from the standpoint of stability of family farm income, it may be well, in many instances, to supplement a wheat production program with a livestock enterprise. Such shifts in farming operations would involve fundamental changes in land use because of the pasture, feed grain, and forage crop requirements of a supplemental livestock program.

**Moisture Conservation** The manner and timeliness with which cultivated land is handled is of the utmost importance in determining the physical condition of the soil and therefore its susceptibility at any time to erosion by the wind. Thus, the general methods of farming that are applied to land in preparing, seeding, cultivating, and harvesting a crop are almost always the major defense against wind erosion. Moisture is the key to the agriculture of the Plains, and successful farming methods make the maximum use of moisture conservation measures.

A number of relatively new farming methods and tillage techniques have been developed to reduce water runoff and to hold the rain where it falls. There is no area in the District where one or more of these methods or techniques cannot be applied to advantage. However, some are impractical on certain types of soil and others require special adaptations according to the location of the area in which they are to be used.

One of the most widely used water saving devices is summer fallow. It is estimated that as many as 40 per cent of the Plains farmers have fallowed land at one time or another. Fallowing cropland means leaving a field idle but clear of vegetative growth for one year. The field is cultivated only when necessary to keep down weed growth and to prevent soil blowing. This practice allows the soil to absorb a full year's rainfall and to hold it in storage for the production of a crop the following year.

Summer fallowing of wheat land is practiced extensively in western Kansas and Oklahoma and in eastern Colorado and can be used in sorghum production. It is recommended for use on the medium and heavy soils which have the capacity to absorb and hold moisture for long periods of time. The moisture holding capacity of sandy cropland soils is so small that fallowing is generally not practical as a means of conserving moisture. Soil moisture tests over a period of years in western Kansas show that the average depth of moisture penetration on fallowed land generally exceeds that on continuously cropped land by a significant margin.

Following the farming practices with which they were familiar, the early settlers plowed and cultivated fields from end to end, with the direction of the tillage rows determined by section lines or the compass. Many fields are still farmed in this way and valuable water is lost by runoff each time it rains. In an area of limited rainfall, the loss of any amount of water from the field where it falls eventually reduces the ability of the soil to produce a vegetative cover that would be protection from wind erosion and a crop that would be income to the owner.

Cultivation of land on the contour is an effective method of reducing water runoff and holding moisture

where it falls and can be applied to practically all the soils in light rainfall sections of the Plains. Contoured land holds a high percentage of the rainfall on the land, thereby promoting a heavier plant growth and soil covering than is likely on fields planted in straight furrows. Next to fallowing, it is probably the most popular water conserving farm practice followed in the Plains area. Its popularity has been attributed to the fact that it permits continuous cropping of all land in a unit, is economical to put into practice, and is generally adapted to heavy farm machinery.

Strip cropping is frequently used in conjunction with contour farming, particularly in the more northern sections of the Plains. In this area it generally consists of planting in alternate strips at right angles to the direction of prevailing winds such close growing crops as wheat and such row crops as sorghums. Wherever practiced on the contour, strip cropping performs the double duty of slowing the speed of water runoff and checking the erosive action of the wind. The practice has some limitations on sandy and silt loam soils, where the strips must be quite narrow in order to be effective. In the central and eastern portions of the area, strip cropping has the disadvantage of increasing the hazard of crop damage from grasshoppers and chinch bugs which can move more readily from one strip to another than from one field to another.

The construction of terraces on soils adapted to their use provides an additional method of moisture conservation in areas of light rainfall. Since terraces follow the contours of the land, their use necessarily requires the application of contour tillage. Over most sections of the Plains, terraces have proved to be of material benefit in storing moisture for wheat and sorghum production.

As in the case of summer fallow, however, terrace farming is most effective on the medium and heavy soils and is not adapted to the deep sandy soils. Terrace construction varies in different sections, depending upon the type of soil and crops grown. The number or spacing of terrace ridges required on a field depends principally upon the water absorptive capacity of the soil and the slope of the land. The width and height of the ridges are determined by the kind of crop or crops to be grown.

**Tillage Methods** The principal objectives in cultivating land in most sections of the Plains, whether farmed on the contour, terraced, or left in summer fallow, are to destroy the weed growth and provide a satisfactory seedbed for a crop. The tillage implements used to accomplish this objective should at all times leave a part of the residue from the previous year's crop on the surface or produce a rough,

cloddy topsoil condition, both of which resist the eroding action of the wind. The protruding crop residue and the rough soil surface are equally important as means of trapping snow and water and holding the moisture for eventual absorption into the soil. In most areas of the Plains, it is never good practice to leave a field in a smooth, clean condition, regardless of the season of the year.

One of the principles of soil management in the early development of the Plains was the use of cultivation implements that penetrated only the top layer of soil and provided a dust mulch. The tools applied were designed to level and pulverize the surface soil, with the objective of maintaining a dry cover over the damp subsoil. In periods of light rainfall it was found that this type of tillage left the soil in an ideal condition to be moved by the wind, and there was a consequent shift in emphasis to tools that dig deep, raise clods to the surface, and leave crop residues on the surface.

There are a number of tillage implements, several of recent origin, that produce the topsoil condition necessary to halt or minimize soil blowing. Two of the most widely used are the lister and the chisel. When properly set, both implements raise clods and leave crop residue exposed, providing a rough surface that will catch soil particles and resist the eroding action of the wind. An implement known as the basin lister, a variation of the lister plow, performs the additional service of constructing cross dams at intervals across the lister furrows, thus holding rain water within close limits to bring about more uniform absorption into the soil.

When the soil is sufficiently moist, the one-way plow is employed to good advantage in turning under wheat stubble in such a manner as to leave a considerable portion of the crop residue exposed to protect the surface soil. This implement is extensively used in the heavy wheat-producing sections of the Plains. The moldboard plow has several advantages on many soils of the Plains, providing there is sufficient moisture present in the subsoil to prevent its pulverizing when brought to the surface. The duckfoot cultivator and the rod weeder type of implement are particularly valuable in the cultivation of fallowed land in practically all sections of the Plains. Both implements leave a rough surface and destroy weeds.

Correct knowledge of how, when, and where to use these and similar implements is necessary if their purpose of design is to be effectively realized. For example, special procedures are required in the cultivation and management of fallow land, depending upon the crop rotation in cropping programs. Likewise, the effective use of the lister and chisel is partially, although not altogether, limited to the medium and

heavy soils. Their effectiveness on the deep sandy soils of southwestern Kansas, western Oklahoma, and western Nebraska is somewhat temporary, since it is difficult, if not impossible, to plow deep enough in these soils to bring clods to the surface.

**Emergency Measures** In the event of extreme weather conditions, such as prevailed from 1934 to 1937, soil blowing will likely take place regardless of proper land use and the recommended soil management practices that have been applied to the land. Under these circumstances, it becomes necessary to resort to emergency measures in attempting to halt or at least minimize the blowing. Such emergency measures involve the timely use of tillage implements that will produce a rough, cloddy soil surface, irrespective of whether the land is growing a crop or is in fallow. It is imperative that such tillage be applied to a field as soon as any area within it begins to blow, rather than delay the operation until blowing engulfs the entire field. If the blowing area in a field or in a whole community is permitted to become extensive, control may become impossible. In the past three years, there have been numerous local areas in Kansas, Oklahoma, Nebraska, and Colorado where wind erosion on wheat land has been effectively checked by prompt action. In many of these instances it is felt that only the vigorous and immediate use of emergency measures forestalled the development of serious soil blowing and partial or complete crop failure.

The chisel and the lister are two of the more popular implements used for emergency tillage. If soil and weather conditions indicate that the blowing may become severe, the lister produces higher ridges against the wind and deeper traps to catch shifting soil. If a somewhat lesser degree of blowing is anticipated, the chisel or an even shallower type of cultivator may serve the purpose. Listing and chiseling should be done either on the contour or at right angles to the direction of prevailing winds. Frequently the higher elevations in a field are the first to require treatment. Chiseling and listing may be applied to small areas in a field that have begun to blow, in strips across the field, or to the entire field, depending upon the degree of blowing that exists. Their use on sandy soils is, again, somewhat limited because of the difficulty in producing a rough soil surface. A dry spring frequently results in blow spots developing on the windward slope of a field of growing wheat. The chisel and shovel cultivator are extensively used to check this type of blowing. The operation involves strip chiseling, or plowing these spots with small furrows spaced 35 to 40 inches apart. Numerous wheat plants are destroyed but the final yield of the field is not adversely af-

ected, unless repeated chiseling of a large number of spots in a field is necessary. If one treatment is not sufficient to check the blowing, a second or third application may be required under extreme conditions.

Other implements that are effective in emergency tillage under certain conditions include the moldboard plow and duckfoot cultivator. The moldboard plow has been used to advantage in the construction of ridges at intervals across eroding fields. The shovel and duckfoot cultivators have been helpful in areas where soil blowing is not usually serious and where shallow tillage will produce a rough soil surface.

There are no statistics or conclusive studies that indicate which tillage implement should be used in different degrees of emergencies. Most authorities agree that when soil blowing reaches the emergency stage any implement can be used so long as it does not pulverize the soil but rather develops a rough surface condition. The local county agent, vocational agriculture teacher, or Soil Conservation office constitute the most readily available sources of technical and practical information to which farmers might turn in formulating farm programs that provide for protecting the land from wind erosion.

**Goal is Complete Protection** The limited rainfall of the Plains, which basically is responsible for the problem of soil blowing, has long been regarded as the controlling factor in building sound farming systems and soil management practices in the area. The vast educational resources of the state agricultural colleges and various state and Federal agencies have for many years been directed toward developing and establishing the use of crop and livestock production methods that conform to the limitations imposed by this controlling factor. The progress in encouraging their adoption has been substantial, but acceptance has not been universal. The human element, with the characteristic resistance to a change in the usual way of doing things, remains yet as an obstacle to attaining complete protection from soil blowing.

At the present time it appears that about three fourths of the cropland in the Plains states is now being operated under systems of farming and with methods of soil management that offer protection from soil blowing, provided the land produces a crop each year under continuous cropping or every other year where summer fallowing is practiced. The difficulty is, as the crop history of the area clearly testifies, that crops are not produced every year or every second year. One or several consecutive dry years resulting in crop failures leave the soil exposed to the eroding forces of prevailing winds, the results of which approach or actually reach the point of disaster.

BUSINESS AND AGRICULTURAL CONDITIONS

MEMBER BANK CREDIT

During April, changes in District member bank loan volume continued in accordance with seasonal tendencies, as reserve city bank loan volume declined by 7 million dollars and country bank loan volume expanded by 9 million dollars. Thus, the amount of loans outstanding for all member banks showed little net change during the month.

For the first four months of this year, District member banks expanded their loans by 32 million dollars compared with an increase of 57 million during the comparable period a year ago. Because of the rapid increase during the last half of 1947, however, the level of loans now is much higher than a year ago. The increase for the year ended April 30 was 233 million dollars, an increase of 22 per cent.

District reserve city member bank loan volume has been decreasing for the past three months, and for the first four months of this year it showed a net decrease of 7 million dollars compared with an increase of 17 million during the first four months of 1947. District country member bank loans have shown about the same change during 1948 as during 1947, as loans increased by 38 million dollars during the first four months of 1948 and by 40 million during that period last year.

Data indicating the changes in various types of loans during 1948 are available only for city banks. Reports from 57 District weekly reporting banks show a decrease of 18 million dollars in commercial, industrial, and agricultural loans and a decrease of 6 million in loans for purchasing or carrying securities, mostly Government securities. On the other hand, real estate loans increased by 9 million dollars and the "other" loans category, consisting largely of consumer loans, increased by 10 million.

The pattern of loan change is essentially in line with that for the country as a whole. During the first quar-

BANK DEBITS

	Apr.	4 Mos.	Change from '47	
	1948	1948	Apr.	4 Mos.
	(Thousand dollars)		(Per cent)	
<b>COLORADO</b>				
Colo. Springs.....	34,283	135,233	+4	+4
Denver.....	470,369	1,880,033	+8	+11
Gr. Junction.....	12,755	49,673	+14	+7
Greeley.....	20,928	85,196	+30	+26
Pueblo.....	38,744	142,000	+1	+8
<b>KANSAS</b>				
Atchison.....	18,258	59,464	+27	+6
Emporia.....	9,810	37,874	+13	+4
Hutchinson.....	46,370	177,119	+48	+15
Independence....	6,550	26,574	+11	+5
Kansas City.....	63,674	243,597	+1	+7
Lawrence.....	10,040	40,072	+14	+11
Parsons.....	7,669	30,744	+13	+13
Pittsburg.....	10,991	46,804	+12	+21
Salina.....	39,755	152,503	+30	+15
Topeka.....	81,612	324,503	+7	+3
Wichita.....	206,799	916,499	+21	+17
<b>MISSOURI</b>				
Joplin.....	26,103	104,687	+5	+4
Kansas City.....	1,006,743	4,084,956	+13	+15
St. Joseph.....	95,210	390,310	+11	+12
<b>NEBRASKA</b>				
Fremont.....	16,906	64,520	+42	+32
Grand Island....	21,638	85,861	+13	+14
Hastings.....	14,499	57,345	+6	+8
Lincoln.....	79,403	306,667	+16	+13
Omaha.....	438,111	1,866,690	-1	+4
<b>NEW MEXICO</b>				
Albuquerque....	67,735	281,019	+12	+12
<b>OKLAHOMA</b>				
Bartlesville.....	94,966	356,796	+65	+54
Enid.....	40,216	155,071	+54	+14
Guthrie.....	4,592	16,704	+22	+6
Muskogee.....	24,711	91,820	+33	+5
Okla. City.....	295,372	1,150,807	+19	+13
Okmulgee.....	6,438	26,581	+6	+10
Tulsa.....	486,024	1,852,880	+44	+44
<b>WYOMING</b>				
Casper.....	23,353	92,619	+30	+27
Cheyenne.....	25,569	109,605	+13	+5
District, 34 cities..	3,846,196	15,442,826	+16	+15
U. S., 333 cities....	102,354,000	405,431,000	+17	+14

ter of this year, loans of all weekly reporting member banks in the United States, which are chiefly city banks, increased by only 120 million dollars, while loan volume of all other commercial banks, which are chiefly country banks, expanded by 700 million. For the weekly reporting banks, commercial and industrial

SELECTED ITEMS OF CONDITION OF TENTH DISTRICT MEMBER BANKS  
(In millions of dollars)

	ALL MEMBER BANKS			RESERVE CITY BANKS			COUNTRY BANKS		
	Apr.28 1948	Mar.31 1948	Apr.30 1947	Apr.28 1948	Mar.31 1948	Apr.30 1947	Apr.28 1948	Mar.31 1948	Apr.30 1947
Loans and investments.....	4,156	4,142	4,068	2,226	2,204	2,225	1,930	1,938	1,843
Loans and discounts.....	1,292	1,290	1,059	755	762	633	537	528	426
U. S. Government obligations.....	2,501	2,489	2,686	1,284	1,257	1,417	1,217	1,232	1,269
Other securities.....	363	363	323	187	185	175	176	178	148
Reserve with F. R. Bank.....	777	773	767	461	457	460	316	316	307
Balances with banks in U. S.....	577	560	629	256	257	257	321	303	372
Cash items in process of collection.....	247	228	219	230	212	204	17	16	15
Gross demand deposits.....	4,846	4,788	4,795	2,667	2,621	2,652	2,179	2,167	2,143
Deposits of banks.....	796	745	909	736	689	838	60	56	71
Other demand deposits.....	4,050	4,043	3,886	1,931	1,932	1,814	2,119	2,111	2,072
Time deposits.....	670	673	660	363	364	357	307	309	303
Total deposits.....	5,516	5,461	5,455	3,030	2,985	3,009	2,486	2,476	2,446
Borrowings.....	7	7	4	5	5	4	2	2	*

\* Less than \$500,000.

loans declined slightly, while real estate loans and consumer loans continued to increase.

### DEPARTMENT STORE TRADE

Dollar volume of sales at reporting department stores in this District in April was 11 and in the fore part of May about 9 per cent larger than in the corresponding periods last year, as compared with a gain of 8 per cent for the first quarter. The relatively large recent increases reflect chiefly the stimulus of warm weather, post-Easter clearances of women's apparel, and an unusually heavy demand for major household appliances. Instead of an expected decline following Easter, department store sales increased from March to April and the seasonally adjusted index of daily average sales rose from 307 per cent of the 1935-39 average in March to 337 in April. This was a new record level, exceeding by a small margin the previous peak of 335 last November.

Department store inventories declined contraseasonally during April, and the seasonally adjusted index of stocks dropped from a peak level of 353 per cent of the 1935-39 average at the end of March to 325 per cent at the end of April. This was the first decrease in nine months. Stocks of merchandise on hand April 30 were 14 per cent larger in value than a year ago, and outstanding orders were about 5 per cent larger.

Department store sales and stocks in leading cities:

	SALES		STOCKS
	Apr.'48 comp.to Apr.'47	4 Mos.'48 comp.to 4 Mos.'47	Apr. 30,'48 comp. to Apr. 30,'47
	(Per cent increase or decrease)		
Denver.....	+4	+4	+3
Pueblo.....	+5	+15	+16
Hutchinson.....	+7	+6	+33
Topeka.....	+13	+11	+24
Wichita.....	+12	+9	+23
Joplin.....	+8	+8	+21
Kansas City.....	+13	+11	+10
St. Joseph.....	-1	+1	*
Omaha.....	+7	+5	+6
Oklahoma City.....	+16	+12	+32
Tulsa.....	+25	+18	*
Other cities.....	+11	+6	+23
District.....	+11	+9	+14

\* Not shown separately but included in District total.

### INDUSTRIAL PRODUCTION

**Meat Packing** As indicated by packers' purchases at central markets, cattle slaughter in this District during April was down 24 per cent from March and was 51 per cent below April, 1947. Hog and sheep slaughter in April also was down sharply from the previous month and from a year ago. However, total meat production under Federal inspection in the entire country for the week ended May 15 was only 14 per cent less than in the same week a year ago. Roughly, these statistics indicate that the volume of meat production in this District had been more ad-

versely affected by the meat strike than had production for the country as a whole. Local meat supplies in this region have remained adequate, but the volume of meat shipped to eastern points has been reduced substantially.

Cold storage holdings of all meats declined by an unusually large amount during the month of April. While withdrawals of beef, pork, and other meats are usual for this time of year, the net out-of-storage movement in April was considerably more than average for that month. Beef stocks declined by 27 million pounds and pork by about 48 million pounds, as compared with average April decreases of 8 million and 26 million pounds, respectively. Meat in cold storage has been withdrawn at a heavy rate since the strike of packing-house workers began on March 16, the movement of meat out of storage partially offsetting the decline in the current production of fresh meat.

**Flour Milling** Flour milling operations in the Southwest during the first part of May averaged about 93 per cent of capacity, the same level as that prevailing during April. Several mills in Omaha operated the full seven days of the week ended May 8, while running time in other cities was limited to five days. Flour production in the first four months of this year was approximately 5 per cent below the same period of 1947, reflecting the somewhat lower level of milling operations thus far in 1948 as compared with a year ago.

The volume of flour sales throughout the Southwest in the first week of May reached the highest point since late March. A strike of certain bakery workers in Denver held flour sales of Denver mills at a low level, and various other centers reported only limited flour business early in May. Generally, however, continued buying by the Government, the receipt of export licenses for Latin American trade, and purchases by chain bakeries resulted in an improved flour sales situation. Favorable prices for by-product millfeeds permitted mills to take full advantage of flour price discounts to attract new business. The threatened railroad strike near the middle of May failed to stimulate any appreciable further increase in purchases by the large flour users, and family flour sales remained only in fair volume.

**Petroleum** A definite increase in the number of tank cars available for moving petroleum and refined products has been reported in the Mid-Continent area. The main problem presently facing marketers, however, is that of obtaining sufficient quantities of these products, especially gasoline, to meet the seasonal demand. Early in May, tank-car prices on both regular and premium gasoline were in-

creased by one major oil company in the Mid-Continent area. It is also reported that, although high bonuses are being offered for gasoline supplies, little additional quantities are appearing on the market. The close balance between supply and demand for gasoline may thus result in temporary spot shortages, with the greatest pressure rising during the summer harvest and vacation months.

During the first quarter of the year, drilling operations in the nation increased sharply, with total completions 12 per cent higher than in the first three months of 1947. Although completions in the Tenth District increased only slightly, Colorado and Wyoming stepped up drilling operations about two thirds above a year ago. Completions in Oklahoma accounted for about half of the total drilling activity in the District, with Kansas reporting approximately one third of the total. In southwestern Kansas, exploration crews drilling near Elkhart have reported the discovery of an artesian well flowing 700 gallons of water a minute. Undoubtedly, this supply will be of considerable importance to industrial concerns seeking new plant locations where large quantities of both natural gas and water are readily available.

Production of crude oil in the Tenth District averaged 1,016,600 barrels a day during April. This level of output was 5 per cent higher than that of the previous month and 9 per cent above April last year. All the principal oil-producing states of the District reported increased output over April, 1947.

Estimated gross crude oil production, based upon reports of the Oil and Gas Journal and the Bureau of Mines:

	Apr. 1948	4 Mos. 1948	Change from '47	
	(Thousand barrels)		Apr.	4 Mos.
			(Per cent)	
Colorado.....	1,335	5,472	+15	+21
Kansas.....	8,869	33,803	+3	+2
Nebraska.....	14	62	-18	-18
New Mexico.....	3,830	15,377	+20	+22
Oklahoma.....	12,207	48,406	+7	+8
Wyoming.....	4,242	16,952	+20	+26
Six states.....	30,497	120,072	+9	+10
United States.....	162,507	646,957	+9	+11

**Employment** The recently authorized increase in the nation's air force has had a decided influence on manufacturing activity in this District. The Boeing Airplane Company's B-29 plant at Wichita has hired about 1,300 additional workers, making a total employment of about 3,000 near the middle of May. Present plans call for a steady expansion to about 7,000 aircraft workers by the first of August. Before starting its recruitment of new employees, the Boeing Company worked closely with the Wichita Chamber of Commerce and outlined its manpower needs to a representative group of 75 Wichita employers. This procedure proved very effective, and

local businessmen not only assisted in the recruitment program but even released employees whose skills were needed badly by the Boeing Company. This type of arrangement had another advantage in that most of the workers thus hired were local people who already had adequate housing facilities. Qualified applicants from outside Wichita were employed, however, if they could show that they already had obtained housing accommodations.

Certain types of manufacturing concerns in other areas of the District also have been affected by the increase in the nation's air force. It is reported that the Air Force has let contracts with a considerable number of firms in Kansas City and the surrounding territory, not only for airplane parts but for research and development work as well.

With the enlargement of the nation's air force, this District undoubtedly can expect even more widespread activity to meet the need for aircraft and aircraft parts, just as it did during World War II. This situation will increase the demand for workers whose skills are adaptable to such manufacturing. As many areas in the District are even now experiencing a tight labor market, this added pressure will require the closest cooperation between plant officials and local employers in order to place workers in positions where their skills can be utilized most effectively. It is possible that recruitment of many individuals not now in the labor force will be necessary if present production levels are to be maintained. Enactment of the proposed temporary Selective Service and universal military training programs would remove a large number of young people from the labor force and undoubtedly would place even greater pressure upon the existing labor supply.

**AGRICULTURE**

**Farm Land Values** As of March 1, 1948, farm land values for the country as a whole were 7 per cent above a year earlier and were at the same level as in 1920, the peak year in farm land prices following World War I. Except for Missouri, land values in all states of this District increased more than the national average. Compared with March 1, 1947, land values on March 1 this year had increased in Nebraska by 17 per cent, Kansas 16, Wyoming 14, Colorado 11, Oklahoma 9, New Mexico 8, and Missouri by 3 per cent. Increases were the sharpest in those states in which wheat and range-livestock production are predominant. Land values in New Mexico are now 26, in Colorado and Oklahoma 11, and in Kansas 8 per cent above the 1920 level.

The large savings of land buyers and the continued high level of farm income are still being reflected in the proportion of sales made entirely for cash. Ac-

ording to survey results, about 55 per cent of the recorded farm sales were on a cash basis. The estimated volume of farm sales in the past year was still at a high level although 15 per cent below the previous year. The importance of individuals and commercial banks as sources of farm mortgage credit has been increasing steadily since 1940. In the last two years these two lending groups have together made almost three fourths of the loans to finance purchases of farm land. In this connection it is significant to note that a 50 per cent farm mortgage loan based on current land prices would be roughly equivalent to a 100 per cent loan in 1940.

Department of Agriculture indexes of estimated farm real estate values on March 1:

	Colo.	Kans.	Mo.	Nebr.	N.M.	Okla.	Wyo.	U.S.
	(1912-14 average=100)							
1948.....	157	163	116	126	181	185	168	170
1947.....	141	140	113	108	168	169	147	159
1946.....	125	120	102	96	151	156	132	142
1945.....	108	111	91	86	132	131	115	126
1944.....	93	96	82	77	117	120	102	114
1943.....	78	84	74	64	101	111	88	99
1942.....	69	74	66	59	95	101	78	91
1941.....	63	71	60	55	87	96	71	85
1940.....	61	71	59	58	84	93	68	84
1939.....	61	76	58	65	83	93	66	84
1938.....	60	78	60	69	83	94	66	85
1937.....	60	78	60	72	82	91	66	85
1936.....	57	75	60	73	80	91	65	82
1935.....	53	73	58	72	76	86	62	79
1934.....	54	72	57	72	76	83	62	76
1933.....	54	70	55	69	75	76	62	73
1932.....	65	89	67	90	89	94	77	89
1931.....	81	103	79	106	109	116	95	106
1930.....	83	113	92	113	110	127	98	115
1925.....	92	115	112	123	108	131	100	127
1920.....	141	151	167	179	144	166	176	170
1915.....	93	103	102	101	100	95	103	103

**Crops** Moderate to heavy rains late in May brought much needed relief to wheat in many sections of western Oklahoma and Kansas and eastern Colorado. The wheat crop in central and western Kansas, western Oklahoma, and throughout most sections of Nebraska was beginning to show the effects of dry topsoil at mid-April. Some of the wheat areas in western Oklahoma had not received any appreciable amount of moisture since early spring. Although soil moisture supplies in western Kansas and Nebraska and in eastern Colorado were adequate early in the season, they had become increasingly short since mid-April. Late planted wheat in this region was generally in a fair to poor condition. Many fields were thin, with short stems and a heavy weed growth. A few of these fields have been sprayed with chemicals in an effort to kill the weeds. Some operators report very favorable results from this method of weed control. Elsewhere in the District the wheat crop is reported in generally favorable condition, but additional moisture will be needed for growth before the crop enters the period of dry, hot weather that brings it to maturity.

As indicated by receipts at central markets, the volume of grain marketed in the first four months of this year was sharply below that in the corresponding period of 1947. Grain prices in early May were irregular but generally showed little change from the April level. Except for soybeans, most declines were no more than three to four cents per day and were subsequently followed by recoveries of like amounts.

The lower range of Kansas City cash grain prices:

	May 18 1948	Apr. 30 1948	Mar. 31 1948	Apr. 30 1947
No. 1 dk., hd. wheat, bu. \$2.36¼	\$2.36¼	\$2.37½	\$2.37¼	\$2.63¼
No. 2 mixed corn, bu. .... 2.29	2.29	2.23	2.29	1.56½
No. 2 white oats, bu. .... 1.12½	1.12½	1.18½	1.24½	.90
No. 2 rye, bu. .... 2.30	2.30	2.42	2.42	2.95
No. 2 barley, bu. .... 1.79	1.79	1.78	1.90	1.40
No. 2 white kafir, cwt. ... 3.80	3.80	3.83	3.81	2.77

**Livestock** Prices of spring lambs reached record highs at most central markets in the District in the second week of May. Cattle prices also turned sharply upward and reached the highest levels thus far in 1948. Choice grain fed steers at Kansas City sold at \$34.00 per hundredweight, only 50 cents below the 1947 peak price of \$34.50. At Kansas City, spring lambs established a new high for that market of \$32.50 per hundredweight. Hog prices were generally unsteady but remained at about the same level that prevailed in April. The market for livestock became more active toward the middle of May when many of the strike-bound packing plants began to resume slaughter operations on a limited scale.

Top carlot livestock prices at Kansas City:

	May 18 1948	Apr. 1948	Mar. 1948	Apr. 1947	Apr. 1946	Apr. 1945
(In dollars per hundredweight)						
Beef steers.....	34.00	31.00	30.50	26.50	17.65	17.25
Stocker cattle.....	31.00	29.50	28.90	22.00	15.50	17.65
Feeder cattle.....	29.25	29.25	28.00	23.15	16.90	15.60
Calves.....	29.00	29.00	30.00	26.00	14.50	17.50
Hogs.....	23.00	23.25	25.25	27.25	14.55	14.50
Lambs.....	32.50	27.50	23.75	25.00	17.00	16.75
Slaughter ewes....	13.25	13.00	12.00	11.00	9.00	9.25

Western range feed conditions were rated as poor to good on May 1, with pastures late in developing in many sections. Range feed was short in the dry areas of New Mexico, western Nebraska, and eastern Wyoming. Although insufficient rainfall was retarding the development of spring pastures over much of the Plains area, prospects remained generally favorable for an adequate supply of summer range feed. A considerable number of cattle have been moved off the dry ranges in Arizona and Texas into eastern grazing sections. Generous rains in California halted the emergency movement of cattle from that state, and pastures there are much improved. Throughout April there was a heavy movement of cattle into the Osage and Blue Stem pastures of Oklahoma and Kansas, which are reported to be in excellent condition.