

MONTHLY REVIEW

Agricultural and Business Conditions

TENTH FEDERAL RESERVE DISTRICT

VOL. 33, No. 8

FEDERAL RESERVE BANK OF KANSAS CITY

AUGUST 31, 1948

WATER EROSION OF SOIL*

Occurrence Rain falls in some amount on virtually every field of crop and pasture land in the Tenth Federal Reserve District. Wherever rainfall or other water flows across the surface of land, soil particles are moved by the force of water in motion. Thus, except on level river bottom cropland, water erosion of soil occurs to some extent in all sections of the District. Obviously, the greater the amount of annual rainfall and surface runoff of water, the greater is the amount of soil moved.

Although water erosion is not a major problem in the western two thirds of the Tenth District, it is by no means nonexistent. Extremely heavy rains, or "gullywashers," occasionally fall and cause serious

rainfall on the field where it falls and conserving soil moisture supplies. If these objectives are attained by the use of terraces, contour plowing, strip cropping, or summer fallowing, all with proper tillage implements, protection from water erosion is generally adequate.

In the eastern one third of the Tenth District, rainfall is not normally the limiting factor in crop and livestock production but is, rather, the cause of an appalling loss of fertile crop and pasture soils. Studies indicate that in many areas of this region from one half to three fourths of the fertile topsoil has been washed away. Statistics, however, as interesting and painfully true as they are, will not return one particle

ESTIMATES OF SOIL CONSERVING MEASURES NEEDED AND APPLIED, 1947*

State	Acres of Contour Planting		Acres of Strip Cropping		Miles of Terraces		Miles of Diversion Ditches	
	Needed	Applied	Needed	Applied	Needed	Applied	Needed	Applied
Colorado.....	6,000	105	1,500	67	**	**	5	***
Kansas.....	7,400	621	3,800	46	546	12	22	1
Missouri.....	4,400	52	**	**	102	***	**	***
Nebraska.....	5,200	767	2,200	80	360	7	38	1
New Mexico.....	1,300	340	300	47	53	2	**	1
Oklahoma.....	6,400	1,131	3,100	61	371	39	22	2
Wyoming.....	270	5	372	5	**	**	**	**

*Practices applied in Soil Conservation Districts only. **Estimates not available. ***Less than 500 miles.
SOURCE: Data furnished by the U. S. Soil Conservation Service.

soil washing, particularly in seasons when cultivated land has no vegetative cover. Large areas of crop and pasture land along the eastern slope of the Rocky Mountains are seriously damaged annually by such intensive rainfall. It is estimated that about 4 million acres of land in New Mexico and 15 million acres in Colorado have been severely eroded by water.

Nevertheless, the disposal of excess rain water is still not a principal land management problem in the Western Plains area of the District. Conversely, since rainfall is the limiting factor in crop and forage production, the major objectives in soil management practices throughout the area remain those of holding

of lost soil. It is the soil that remains that is important. Although much soil is still largely intact and productive, it is being permitted to erode in some regions at a pace that will render it unproductive and useless in the space of a few years. If the remaining productive soils are not protected from further erosion losses, owners may likely find crop yields and livestock production declining in future years in spite of the introduction of new higher yielding crop varieties and improved animal breeding techniques.

Water erosion of soil generally takes place in two forms: (1) Sheet erosion and (2) gully erosion. Both may occur on the same field or pasture simultaneously or sheet erosion may, and frequently does, develop into gully erosion. As indicated by the estimates in the accompanying table, the task of preventing water

*This article is the third 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. The second article, "Wind Erosion of Soil," appeared in the May 31, 1948, issue of the Monthly Review.

erosion of soil in states of the Tenth District is only well begun.

Sheet Erosion Sheet erosion is generally described as the gradual washing away of topsoil in thin layers. It is most likely to occur on clean, cultivated, sloping fields whenever the volume of rainfall exceeds the water absorptive capacity of the soil. Actually, sheet erosion is caused by the action of countless rivulets or miniature rivers formed on the soil surface during rainfall and not by a sheet of water constantly moving off a field.

The susceptibility of various types of soil to sheet erosion, whether cultivated or pastured, depends upon topography, intensity of rainfall, and the soil management practices applied. Some types of soil, by reason of their physical make-up, erode more easily than others under essentially the same conditions of topography, climate, and management. Although cultivated land is more readily subject to water erosion, sloping pasture and range lands that are overgrazed and otherwise mismanaged also suffer from the loss of large portions of productive topsoil. In extreme northwestern Missouri, northeastern Kansas, and southeastern Nebraska, where a type of soil known as the Marshall silt loam is predominant, many farmers comment that over the years their soil gradually changed from a dark to a light color. The facts are that the almost invisible action of sheet erosion gradually removed the humus-filled, dark colored topsoil and slowly exposed the humus-deficient, light colored subsoil. In some sections of this area only 4 to 6 inches of topsoil remain. The original depth of the Marshall silt loam was from 15 to 18 inches.

In northeastern Oklahoma and southwestern Missouri, experience with a soil called the Baxter silt loam indicates that wherever it has been cultivated over a period of years sheet erosion has been extensive. Farmers complain that stones are continually working to the surface. Many of them fail to recognize that, in addition to the heaving effects of freezing and thawing, sheet erosion has been removing the surface soil from the rocks. About two thirds of the original Baxter topsoil has been lost from fields that have been under continuous cultivation.

Measures for protecting land from soil losses by sheet erosion are based on a single principle: slowing down the rate at which excess water runs off the surface of the land. As one authority has stated, "the 'runoff' must be slowed to a 'walk off'."

Some of the farming practices that conform to this principle are contour cultivation, terracing, strip cropping, and crop rotations. The measure or measures that should be applied to either cultivated or pasture land vary in different localities depending

upon the degree and length of slope, soil type, volume and intensity of expected rainfall, and personal preference.

Contour farming offers a practical means for halting or minimizing surface runoff except on the shallow clay pan soils which have a small water absorbing capacity. The contour furrows, which follow the curvature of the cultivated slope, catch the excess surface water almost immediately and hold it for absorption into the soil. Widely spaced contour furrows on pasture land are effective in much the same way. Where the water absorptive capacity of the soil is not large enough to hold the volume of water commonly received in rainfalls of the locality, drainage ways of sod at intervals across fields provide a safe method of carrying off excess water. In addition to minimizing sheet erosion, the smaller runoff from contoured fields may increase crop yields. These advantages are shown in the accompanying table which summarizes the results of soil and crop experiments conducted in Oklahoma.

SOIL AND WATER LOSSES AND CROP YIELDS ON
CONTOURED AND STRAIGHT ROW FARMING

Type of Tillage	Water Loss Per Cent	Soil Loss Tons per Acre	Cotton Yields Lbs. per Acre
Contoured	7.99	16.6	432
Straight rows	9.11	38.2	404

SOURCE: Technical Bulletin 837, Red Plains Conservation Experiment Station, Guthrie, Oklahoma, 1932-38.

Terraces properly used on either crop or pasture land reduce soil losses from sheet erosion. In the eastern sections of the Tenth District the "drainage" type of terrace is usually employed to intercept runoff water and to carry it slowly from the field in protected channels. The ridges and channels that make up the terrace cut the long slope of a field into short slopes, thereby preventing runoff water from attaining a high velocity.

The construction and maintenance costs of terraces are sometimes cited as being in excess of their long-run value. Most authorities agree that if erosion can be controlled by contour farming, strip cropping, and good soil, crop, and pasture management practices, it may not be necessary to use terraces. However, on cultivated soils that are characterized by a heavy clay or impermeable subsoil such as those in southeast Kansas, the use of drainage terraces may be the only practical means of erosion control. At the same time, it is generally not advisable to use terraces on fields where the slope exceeds 6 to 8 degrees. Technical assistance may be required in determining whether the soil is adapted to terracing, the changes that must be made in the location of fields, fences, and roads, the number and grade of terraces necessary on different fields, and where protected drainage ways should be

established. The usefulness of terraces in reducing soil loss is shown in the accompanying table.

SOIL AND WATER LOSSES FROM TERRACE AND STRAIGHT ROW FARMING

Treatment	Runoff as Per Cent of Rainfall	Soil Loss Tons per Acre
Terraces, contoured	11.2	3.63
Straight row farmed	15.8	17.13

SOURCE: Hydrologic Division, Research SCSTP-39, Bethany, Mo., 1941.

Although strip cropping has some limitations from the standpoint of efficient crop production, it is an effective method of protecting cultivated land from surface soil losses. As practiced in the eastern parts of Nebraska, Kansas, and Oklahoma, a system of strip cropping generally involves the planting of row crops such as corn and close growing crops such as alfalfa in alternate strips across or on the contour of a field. The strips of close growing, soil binding legumes act as a check to the velocity of runoff water flowing down the slope from the strips of row crops. In most well run cropping systems, the strips are rotated from time to time, with row crops being planted in the strips that were formerly planted to close growing crops.

Strip cropping is adapted for use on most soils that are suitable for the production of both close growing and row crops. As a cropping system, however, it has certain disadvantages. On steep sloping fields it is often necessary to plant the crops in rather narrow strips and many difficulties in cultivating and harvesting may be encountered. In strip cropping systems that employ corn or sorghums with a fall seeded small grain, chinch bugs and grasshoppers frequently cause serious damage. In addition, a system of strip cropping that is not carefully planned to suit the particular field or farm unit may increase the difficulties of field and soil management to an extent that is out of all proportion to the benefits derived.

AVERAGE EFFECT OF A CROP ROTATION ON RUNOFF AND SOIL LOSS

Crop	Runoff as Per Cent of Rainfall	Soil Loss Tons per Acre
Rotation of cotton, wheat, and sweet clover.....	9.3	3.64
Cotton	11.0	8.81
Wheat	11.0	1.59
Sweet clover	6.0	0.49
Continuous cotton	12.0	16.06

SOURCE: Daniel, Elwell, and Murphy, Oklahoma Experiment Station Bulletin No. B-257, "Conservation and Better Land Use for Oklahoma," 1942.

Crop rotation, while primarily a land use practice, nevertheless is a valuable aid in minimizing the sheet erosion. Land that is farmed continually with a row crop is considerably more susceptible to water erosion than that farmed with a rotation including such close

growing crops as sweet clover or alfalfa. It is evident that different crops vary widely in the degree of erosion resistance they furnish, a fact that is clearly indicated in the accompanying table.

A crop rotation that is well planned for adaptability to a locality places a crop that is hazardous from the standpoint of erosion after a crop which tends to make the soil resistant to erosion. This resistance is the result of three factors: (1) The binding effect of plant roots in the soil, (2) protection from the beating action of rainfall afforded the soil by a vegetative cover, and (3) the water checking effect of the surface portion of vegetation. Crop rotations can and in all probability should be used on cultivated and temporary pasture land in most sections of the eastern part of the District. They are important not only from the standpoint of their value as a barrier to water erosion but also because of their function of building soil fertility.

Gully Erosion

Gullies usually develop when concentrations of excess water are allowed to run off the numerous watersheds of a field in natural but unprotected drainage ways. The depressions made by tractor and implement wheels on a sloping field are often the beginning of serious gully development. The cutting power of water flowing through such passages is sufficient to cause small gullies to form in a short period of time during heavy rainfall. Each year, countless new gullies are allowed to break out on fields heretofore free of their menace, and old gullies are permitted to become larger and progressively more destructive. While it is both more desirable and economical to remove the conditions that cause gullies than to control them once they have formed, the immediate problem in eastern Kansas, Nebraska, and Oklahoma is to arrest the development of gullies already formed.

By and large, the methods of soil and crop management that minimize sheet erosion also aid directly in preventing the formation of gullies. However, in the treatment and elimination of existing gullies, it must be recognized that before the original sod and timber covering was removed from the land, most soils were amply protected from gully erosion. When the trees were cleared and the sod plowed from natural drainage ways, runoff water continued to use these natural depressions in finding its way off fields and pastures. It has been man's neglect in replacing these protective provisions of nature that is largely responsible for gully erosion. There are three principal ways in which these mistakes can in some measure be corrected: (1) Hold excess water on the field or pasture for absorption into the soil, (2) divert the normal course of runoff water away from existing gullies,

and (3) replace the natural vegetative cover or provide mechanical soil protecting devices to allow runoff water to move through existing drainage ways.

On relatively deep soils with an adequate water absorptive capacity, a large amount of excess water may be held on a gullied field by growing adapted crops in an approved crop rotation and by using proper tillage methods and soil management practices such as contouring and terracing. A suitable program of cropping and tillage lessens the amount of excess water that must drain from a field through established gullies and thereby retards gully development. Thereafter, any number of operations may be required to rehabilitate a field, depending upon the number and depth of the gullies. Those that are comparatively shallow may be filled with dirt. Deeper and larger gullies with small watersheds may eventually be resurfaced by crossing them with obstruction dams of dirt, brush wood, woven wire, or planking.

In areas where the surface soil is shallow with an impervious subsoil, the water absorbing capacity is usually too small to attempt reducing surface runoff by holding rainfall on the land. Excess water must then be disposed of in other ways if existing gullies are to be remedied and the development of new ones prevented. In such areas the use of drainage terraces or diversion channels located at the heads of gullies are sometimes recommended. The terrace or diversion channel, whichever is used, intercepts the runoff before it enters the gully and carries the water around the gully to a distant disposal point. In using the drainage terrace or the diversion ditch, it is important that the disposal point or outlet be at a location that is well protected by vegetation, rocks, or other devices that spread the concentrated runoff over a wide area or discharge it into a well established drainage ditch.

The type of soil and topography of many cultivated fields and permanent pastures sometimes make it impossible either to hold the excess water on the land

or to divert it from existing gullies. In these instances there is no choice but to allow the runoff to pass through the eroded drainage ways. However, much can be done to prevent such ditches from becoming larger and more destructive. Large gullies can sometimes be treated by grading down the banks to a gentle slope and establishing grass sod on the sides and over the bottom. Other vegetation such as willows or shrubs can be planted across the gully at intervals. Also, sod flumes and sod strips are effective in checking many forms of gully erosion.

Serious gully erosion on pasture lands of eastern Nebraska, Kansas, and Oklahoma has often been the result of overgrazing. Such abuse is likely to reduce at least temporarily the water absorbing ability of the soil and also the effectiveness of the vegetation in checking the speed of water runoff. Indiscriminate cutting of timber and brush from pasture lands has also been an important cause of gully erosion in pastures. Gully control on such land can be facilitated by planting trees, bushes, or vines over the eroding areas and fencing them from livestock until the vegetation becomes well established.

If gully control by vegetation is not adequate, mechanical devices may be applied on either cultivated or pasture land. Check dams of cement, stone, brush, woven wire, planking, and earth are some of the more effective of these devices. Permanent structures such as rock or cement flumes and farm ponds with controlled outlets are often necessary where gullying has progressed far beyond the stage of initial development. The selection of one or several mechanical means of controlling gully development should be governed by the soil and drainage problem found on each individual field and farm and not by such standards as appearance and local popularity. Whatever the methods selected, the drainage and erosion control system should be in harmony with that used on adjacent farms or fields.

BUSINESS AND AGRICULTURAL CONDITIONS

MEMBER BANK CREDIT

Loan volume of District member banks expanded further during July, reflecting in part seasonal advances to grain dealers and millers in connection with the marketing of the new wheat crop. The increase in loans measured about 4 per cent at both reserve city and country member banks, with loan volume at both classes of banks reaching a new high point for 1948. The July increase in loans at country banks was substantially larger, and that at reserve city banks considerably smaller, this year than last. Consequently, country bank loans now show an increase

of 27 per cent over a year ago, while reserve city bank loans show a somewhat smaller gain of 17 per cent.

Member bank holdings of Government securities, which by midyear had declined to the lowest point in 1948, increased slightly during July, and at reserve city banks there was a sizable increase during July in holdings of other securities also. Holdings of Government obligations are down 9 per cent from a year ago at reserve city banks and are down 4 per cent at country banks, while other security holdings are up 13 and 17 per cent, respectively.

Deposit increases at District member banks in July this year generally were far less pronounced than

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

	ALL MEMBER BANKS			RESERVE CITY BANKS			COUNTRY BANKS		
	July 28 1948	June 30* 1948	July 30 1947	July 28 1948	June 30* 1948	July 30 1947	July 28 1948	June 30* 1948	July 30 1947
Loans and investments.....	4,251	4,164	4,144	2,300	2,236	2,293	1,951	1,928	1,851
Loans and discounts.....	1,376	1,325	1,137	802	771	684	574	554	453
U. S. Government obligations.....	2,497	2,471	2,677	1,301	1,278	1,434	1,196	1,193	1,243
Other securities.....	378	368	330	197	187	175	181	181	155
Reserve with F. R. Bank.....	812	799	769	491	481	460	321	318	309
Balances with banks in U. S.....	620	634	690	261	284	277	359	350	413
Cash items in process of collection.....	270	273	251	253	252	235	17	21	16
Gross demand deposits.....	5,050	4,964	4,967	2,806	2,755	2,771	2,244	2,209	2,196
Deposits of banks.....	865	829	1,005	801	768	930	64	61	75
Other demand deposits.....	4,185	4,135	3,962	2,005	1,987	1,841	2,180	2,148	2,121
Time deposits.....	665	668	664	357	359	359	308	309	305
Total deposits.....	5,715	5,632	5,631	3,163	3,114	3,130	2,552	2,518	2,501
Borrowings.....	3	3	5	2	2	4	1	1	1

*Revised.

those in July last year. At country banks an increase in demand deposits other than interbank represented largely the proceeds of wheat sold by country bank customers, and at reserve city banks interbank demand deposits increased as wheat payments to country bank customers cleared through the city banks and built up country bank correspondent balances at the city banks. Demand deposits other than interbank

are 9 per cent larger than a year ago at reserve city banks and 3 per cent larger at country banks, while interbank deposits show a decrease of about 14 per cent.

DEPARTMENT STORE TRADE

Dollar volume of sales at reporting stores in this District in July and in the first seven months of 1948 was 9 per cent larger than in the corresponding periods of 1947. In the first half of August, sales showed an increase of 15 per cent over a year ago, but allowance should be made for the fact that the August comparison is with a period of temporary slump in sales last year. Sales this year decreased considerably more than is usual during June and July, and the seasonally adjusted index of daily average sales by July had declined to 317 per cent of the 1935-39 average as compared with the record level of around 337 per cent prevailing last April and May.

Department store sales and stocks in leading cities:

	BANK DEBITS		Change from '47	
	July 1948	7 Mos. 1948	July	7 Mos.
COLORADO	(Thousand dollars)		(Per cent)	
Colo. Springs.....	46,715	259,629	+28	+12
Denver.....	499,908	3,338,252	+14	+13
Gr. Junction.....	12,608	87,209	+14	+10
Greeley.....	18,731	144,962	+18	+26
Pueblo.....	56,547	273,871	+54	+19
KANSAS				
Atchison.....	17,395	109,177	+23	+13
Emporia.....	10,899	68,168	+10	+9
Hutchinson.....	52,396	331,022	-11	+22
Independence.....	6,773	46,826	-7	+2
Kansas City.....	67,349	441,773	+19	+12
Lawrence.....	11,084	72,433	+16	+14
Parsons.....	8,586	55,842	+11	+13
Pittsburg.....	11,288	80,543	+8	+17
Salina.....	50,881	280,240	-12	+14
Topeka.....	95,604	603,572	+12	+9
Wichita.....	233,520	1,585,156	+8	+16
MISSOURI				
Joplin.....	26,272	184,757	+6	+7
Kansas City.....	1,208,581	7,406,473	+11	+16
St. Joseph.....	103,732	680,232	+9	+11
NEBRASKA				
Fremont.....	17,455	116,534	+18	+33
Grand Island.....	22,305	152,374	+21	+13
Hastings.....	14,961	102,396	+11	+9
Lincoln.....	81,042	542,115	+16	+14
Omaha.....	525,083	3,310,086	+7	+4
NEW MEXICO				
Albuquerque.....	75,857	493,679	+28	+16
OKLAHOMA				
Bartlesville.....	115,980	704,479	+83	+68
Enid.....	48,930	309,562	-31	+9
Guthrie.....	4,368	30,398	+31	+15
Muskogee.....	24,321	162,267	+20	+12
Okla. City.....	338,401	2,093,265	+27	+16
Okmulgee.....	6,005	45,564	+12	+13
Ponca City.....	18,071	138,846	-20	+1
Tulsa.....	549,123	3,389,666	+50	+43
WYOMING				
Casper.....	28,031	173,504	+35	+33
Cheyenne.....	28,704	191,106	+29	+12
District, 35 cities.....	4,437,506	28,005,978	+16	+17
U. S., 333 cities.....	102,942,000	714,595,000	+10	+13

	SALES		STOCKS
	July '48 comp. to July '47	7 Mos.'48 comp. to 7 Mos.'47	July 31,'48 comp. to July 31,'47
	(Per cent increase or decrease)		
Denver.....	+7	+5	+24
Pueblo.....	+17	+18	+16
Hutchinson.....	-3	+6	+35
Topeka.....	+7	+9	+24
Wichita.....	+13	+10	+33
Joplin.....	+8	+8	+31
Kansas City.....	+10	+10	+13
St. Joseph.....	-3	+1	*
Lincoln.....	-3	+8	*
Omaha.....	+6	+6	+32
Oklahoma City.....	+14	+12	+46
Tulsa.....	+16	+18	+15
Other cities.....	+12	+7	+27
District.....	+9	+9	+24

*Not shown separately but included in District total.

Department store inventories declined contraseasonally in July for the fourth consecutive month, and the seasonally adjusted index of stocks had dropped by the end of July to 266 per cent of the 1935-39 average from the peak level of 353 per cent last March. Stocks of merchandise on hand at the end

of July were 24 per cent larger in value than a year ago, but the volume of orders outstanding was 4 per cent smaller than a year earlier.

INDUSTRIAL PRODUCTION

Meat Packing The slaughter of cattle, hogs, and sheep at principal markets of the District in July was down substantially from June and was also under the volume slaughtered in July, 1947. As anticipated early in this year, the numbers of all types of livestock available for slaughter this summer are considerably less than those in the summer of 1947. Receipts of livestock at public markets so far in 1948 have generally been under the volume in the same months of 1947, and purchases by meat packers have been correspondingly lower. Packers' purchases of cattle at leading markets in the Tenth District during the first seven months of the year were down 30 per cent from the same period a year ago. Calf purchases were down 25 per cent, hogs 15 per cent, and sheep and lambs 10 per cent. Total meat production under Federal inspection in the entire country in the week ended August 14 was 12 per cent below the corresponding week a year ago.

In spite of efforts on the part of housewives to organize a week-long meat buyers' strike in several large cities, there was no material drop in apparent meat consumption by mid-August. One or two eastern cities reported a decrease in meat consumption which was attributed to buyers' strikes. However, since July and August are popular vacation months, such declines were probably due in part to a temporary reduction in city population. In the meantime, various cuts of beef and ham continued to move readily at prices of \$1.00 or more per pound.

Flour Milling Flour milling operations in the Southwest during the first half of August were in excess of 100 per cent of normal full-time capacity because mills generally were running overtime. Many mills in this territory were concerned with the preparation of flour shipments for the Gulf ports to fulfill export contracts specifying September 1 delivery. Much of the flour covered by these export contracts was 80 per cent extraction flour. Several countries, such as India, Italy, and the Netherlands, are regular buyers of the high extraction dark flour which is not popular in the United States.

The volume of flour sales in the Southwest averaged less than 50 per cent of capacity in the week ended August 14. Domestic sales were on a reduced scale but this was offset to some extent by an increase in export sales during the week. Large flour users were again purchasing only small lots and were not inclined to contract for distant future delivery. Al-

though the prices of family grades of flour were generally 10 cents a sack lower at mid-August, sales were scattered and no surge of buying developed.

Petroleum According to the midyear report of the Oil and Gas Journal, the United States set a new oil production record in the first half of 1948 which was 12 per cent over output in the same period last year. The industry also completed an all-time record number of wells in the first half of the year, representing a 26 per cent increase over the first half of 1947. Moreover, the growth of inventories of all oil products during the last four months has been greater than during any similar period in ten years, so that "there is plenty of gasoline for the remainder of the touring season" and "there will be ample supplies of heating oil in all parts of the country next winter." This changed outlook was attributed to two factors: (1) The tremendous increase in crude oil production and its processing by refineries during the last year, and (2) a shift in the United States import-export balance, by which "instead of the United States becoming more dependent on foreign oil, it appears that foreign countries are becoming less dependent on American oil."

In July, a new multimillion dollar refinery in the Kansas City metropolitan area commenced operations. This refinery, the latest development in petroleum technology to increase gasoline production, has a daily capacity of 700,000 gallons of gasoline, 170,000 gallons of diesel oil, 210,000 gallons of heating oil, 90,000 gallons of industrial fuel, and various amounts of coke, asphalt, road oil, naphtha and paraffin waxes. In Kansas, the Kansas Oil Industry Information Committee has predicted that the Kansas oil industry will break all production records in 1948 and will hit a peak 8 to 9 per cent over last year. The year also promises to mark the greatest volume of oil drilling activity in Kansas since the peak year 1918.

The Interior Department has announced that the Navy, the Bureau of Mines, and several petroleum companies are carrying on an intensive program of exploratory drilling assay work to determine the character and extent of western Colorado oil shale beds this summer. The program calls for drilling at least eleven diamond core test holes in the Green River oil shale formation northwest of the towns of Rifle, Grand Valley, and Debeque. This formation has been called the world's largest single mineral deposit and is believed to contain 300 million barrels of shale oil, the equivalent of a 150-year supply of liquid fuels for the United States at the 1947 rate of use.

One of the major petroleum companies has announced that it is ready to launch an expansion program in Colorado and Wyoming calling eventually

for an expenditure of between two and one half and three million dollars. For the first time in history each of Wyoming's 23 counties is having some oil drilling activity, as reports have now brought Sheridan, the twenty-third county, into the picture. Unit operation of oil fields in Oklahoma passed another milestone in mid-August in two of the state's five communized fields where venting of gas had been halted and oil production is gaining.

Employment The consensus is that the new draft beginning some time this fall will bring relatively few short-term manpower worries for industry. The defense supply program is causing somewhat more concern. According to a recent report of the United States Employment Service on the labor market in the four District areas which achieved a wartime employment level of 15,000 or more in aircraft—Kansas City, Kansas-Missouri, Wichita, Tulsa, and Oklahoma City—the labor supply for each city showed only a very slight surplus. Employment in January, 1948, stood at 5,100 in Wichita and at less than 5,000 in the other three cities. In contrast, aircraft employment figures for July, 1944, had shown 48,300 employed in Kansas City, 45,200 in Wichita, 22,000 in Tulsa, and 22,700 in Oklahoma City. A major aircraft producer at Wichita, which issued a call late in May for 1,000 more workers, announced on July 28 that it had a backlog of orders totaling \$300,000,000. Thousands of workers are expected to be added steadily from month to month for the next two years. On July 24, it was announced that an aircraft engine plant at Kansas City would be reactivated for the manufacture of jet engines.

"Surpassing by 300,000 the record high established in June, total civilian employment in the United States reached a level of 61½ million in the survey week of July 4-10," according to the Census Bureau. Agricultural employment was estimated at 9 million, 250,000 under the seasonal peak recorded in June. On the other hand, nonagricultural employment continued to expand, reaching a new all-time high of 52½ million in July, 550,000 more than in June.

Available state employment reports for states in the Tenth District indicate a continuing upward trend. In Wyoming, unemployment compensation in July registered a 40 per cent decrease from a year ago, and "in nearly every section of the state, pay rolls continue upward toward a new all-time peak." Total employment in New Mexico mining, manufacturing, transportation and utilities, trade, finance, service, and regular government industries continued its upward trend in June for the third consecutive month, with an increase of 900 workers. Manufacturing establishments showed the greatest gain, half

of which was in the production of lumber and lumber products.

Kansas reports for July showed a slight nonagricultural employment decline for Kansas City, Kansas. Employment in Hutchinson held steady during June and July. Employment continued to increase in Wichita, and in Topeka it recorded a new postwar peak of 32,300. This was a gain of about 1 per cent over May, with the greatest increase in nonmanufacturing and retail trade. Oklahoma manufacturing employment in June totalled 67,000, a 4.5 per cent increase during the month. The sharp rise was primarily in the food processing industry. Both Tulsa and Oklahoma City anticipate continuing employment increases. Unemployment has faded to an all-time low of 2.3 per cent in Tulsa.

AGRICULTURE

Crops The most outstanding feature of the crop situation is the outlook for bumper crops of wheat, corn, sorghums, barley, soybeans, and many other farm crops. A record corn crop following the harvest of the second largest wheat crop in history is expected to exert a downward pressure on livestock and other farm commodity prices. Some tendency in this direction is already evident, as the index of livestock feed prices dropped about one fourth from early June to August 10. This index for the entire country stood at 220 at mid-August compared with 288 in June. Continued strong prices for livestock and lower feed prices obviously result in more favorable livestock feeding ratios. At Chicago during the week ended August 7, the hog-corn ratio based on all hog purchases passed into the profitable feeding bracket for the first time in many months. The ratio in that week was 12.7. The long time average ratio that marks the line between profitable and unprofitable hog feeding is 12.3. The ratio figure simply indicates the number of bushels of corn equal in value to 100 pounds of live hog.

Growing crops continued to make excellent progress in July and the first half of August, as favorable moisture and temperature conditions prevailed in most sections of the District. Crops in a number of areas in the southern two thirds of Wyoming, however, have suffered from inadequate rainfall throughout the spring and summer, and soil moisture supplies are very low. Likewise, there are dry areas in eastern Colorado and in southcentral and southwestern Oklahoma. The harvesting of winter wheat was largely completed by August 1, although salvage operations were still in progress on fields that were damaged by heavy rains, floods, and hail. Corn was generally in excellent condition and was reported to be about two weeks ahead of normal development. Some feed-

	RAINFALL			
	July 1948	July Normal	7 Mos. 1948	7 Mos. Normal
	(In inches)			
COLORADO				
Denver.....	.93	1.68	9.43	9.33
Leadville.....	1.09	3.02	10.66	11.68
Pueblo.....	.51	1.94	10.14	7.60
Lamar.....	1.42	2.47	7.51	10.15
Alamosa.....	.35	1.20	4.39	3.87
Steamboat Springs....	2.00	1.46	11.10	14.15
KANSAS				
Topeka.....	5.81	3.41	24.14	18.92
Iola.....	15.74	3.06	35.07	22.26
Concordia.....	6.38	3.10	20.65	15.74
Salina.....	5.88	2.70	21.14	16.48
Wichita.....	6.39	2.89	23.36	18.67
Hays.....	5.57	2.87	21.06	14.67
Goodland.....	1.62	2.67	12.75	11.60
Dodge City.....	5.25	2.67	16.95	12.80
Elkhart.....	1.84	2.40	11.63	10.62
MISSOURI				
St. Joseph.....	6.82	3.78	23.67	22.05
Kansas City.....	7.29	3.82	21.57	21.06
Joplin.....	8.82	4.62	34.49	27.72
NEBRASKA				
Omaha.....	5.91	3.54	15.20	17.38
Lincoln.....	2.50	3.85	15.91	17.68
Norfolk.....	4.02	3.41	12.32	17.65
Grand Island.....	3.97	3.13	16.37	16.39
McCook.....	2.86	2.83	14.76	13.12
North Platte.....	3.12	2.74	8.90	12.58
Bridgeport.....	1.18	2.09	11.53	10.87
Valentine.....	3.29	3.01	12.86	12.60
NEW MEXICO				
Clayton.....	3.38	2.54	12.07	9.58
Santa Fe.....	1.45	2.44	7.96	7.85
Farmington.....	.05	1.05	3.83	4.51
OKLAHOMA				
Tulsa.....	3.61	3.26	27.45	22.89
McAlester.....	2.25	3.07	22.41	26.14
Oklahoma City.....	3.54	2.86	29.84	18.98
Pauls Valley.....	2.28	2.74	25.79	21.40
Hobart.....	1.28	1.96	12.85	16.20
Enid.....	3.30	2.40	16.54	17.45
Woodward.....	1.31	2.62	14.23	15.25
WYOMING				
Cheyenne.....	2.34	2.10	8.63	10.24
Casper.....	.93	1.20	7.07	9.30
Lander.....	.99	.69	7.16	8.58
Sheridan.....	2.98	1.22	16.31	10.56

ing of new corn was being done in a few areas. The warm and dry weather which moved into most of the Plains states after mid-August was expected to speed the maturity of the crop and to put it in an almost ideal condition for early harvesting.

Livestock Several significant developments have taken place recently in the livestock situation aside from the new record high prices paid for cattle and hogs. The most important consideration is the possible effect of the present grain and feed supply outlook on future livestock production. Sheep numbers have been declining since 1942 and cattle and hog numbers since about 1945. Population, employment, and purchasing power have been increasing. The result has been and continues to be higher livestock and meat prices. Using past experience as a guide, it does not appear that the upward trend in livestock and meat prices can reverse itself to any great extent under conditions of increasing demand

and decreasing supply. Basically, it would seem that one of two actions is necessary before such a reversal can take place: (1) Purchasing power must decrease, or (2) livestock numbers (supply) must increase. For the first time in several years, the outlook for grain and feed production gives promise of an extended period of favorable livestock feeding ratios, a prerequisite to any period of increasing livestock numbers and meat production. Because of the time required for livestock to convert grain and other feeds into meat, it will likely be mid-1949 before the results of favorable feeding ratios become apparent to the meat consumer.

Effective August 16, the Canadian Government discontinued export restrictions on beef cattle and calves, dressed beef and veal, and other beef, veal, and meat products destined for the United States. Although the number of cattle in Canada available for export to the United States is thought to be quite small, any increase in the supply of feeder cattle will be readily utilized in the feedlots of the northern Corn Belt if this country's 3½ billion bushel corn crop materializes. Canadian exports of cattle and calves to the United States in the five years prior to 1942 averaged 225,000 head per year. During the week ended July 31, the average price of choice steers at Winnipeg, Canada, was \$21.11 per hundred pounds and at Chicago \$39.42 per hundred pounds.

Top carlot livestock prices at Kansas City:

	Aug. 16 1948	July 1948	June 1948	July 1947	July 1946	July 1945
	(In dollars per hundredweight)					
Beef steers.....	39.00	40.00	38.75	31.00	26.50	17.65
Stocker cattle.....	29.00	31.50	30.25	23.00	15.15	17.50
Feeder cattle.....	32.00	34.25	34.00	27.75	20.75	15.50
Calves.....	31.50	33.00	31.00	23.00	15.50	18.50
Hogs.....	30.75	30.00	29.25	28.25	23.50	14.50
Lambs.....	27.50	33.00	33.00	26.25	21.00	16.35
Slaughter ewes.....	11.00	11.25	11.50	8.50	10.25	8.25

The number of cattle on feed August 1 in the Corn Belt states was about 12 per cent smaller than on that date last year. Nebraska and Iowa had 25 per cent fewer cattle on feed than a year ago, but the number on feed in Kansas and Minnesota was 10 and 8 per cent higher, respectively. At mid-August the heavy seasonal movement of grass fed cattle from western states to the Corn Belt had not yet begun because of the excellent condition of western pastures. Although the marketing of grass cattle will eventually swell the number of cattle on grain feed in the Corn Belt, it is expected that feeder buyers will encounter strong competition from meat packers for the heavier weight grassers which would normally not be considered ready for slaughter. If a sufficient number of these so-called "two way" cattle are slaughtered, many Corn Belt feeders may experience some difficulty in finding an outlet for the record corn crop.