

**Undeveloped Mineral Rights  
As a Source of Farm Income  
In Western Oklahoma**

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# Undeveloped Mineral Rights as a Source of Farm Income in Western Oklahoma

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Income from land in most of Oklahoma involves income from the oil and gas which may be found underground as well as income from the farm and ranch operations on the surface of the land. Income from the subsurface is of two types: (1) Oil or gas actually produced (royalties); and (2) Payments for the right to drill for oil (leases).\*

From the standpoint of total value, income from royalties on produced oil is the more important of the two sources of subsurface income. However, from the standpoint of the amount of land involved and the number of persons affected, income from leasing subsurface rights assumes great importance.

Oklahomans are increasingly recognizing that income from leasing is an important element in the State's agricultural economy. Therefore, the Experiment Station undertook a study of the situation in the western part of the State (see map, Figure 1.) This bulletin is a report of that study. The data obtained point to the following conclusions:

1. Income from undeveloped mineral rights amounts to about one-fourth of the total income to land in the area. A majority (62 percent) of the farms in the area participate in this income.

2. It can normally be expected that, over a period of time, one-fourth of the land in western Oklahoma will be under lease for oil and gas. However, the exact proportion will vary from year to year. Between 1938 and 1947 there was an upward trend. In the latter year, 44 percent of the land was under lease.

The proportion under lease is not uniform for all parts of western Oklahoma. In some parts it was above 50 percent; in others, it was as low as 15 percent. The variation among areas is described in more detail later in this bulletin.

Total income received by landowners in western Oklahoma from leases averaged about \$6,000,000 annually for the period

\* The general procedure in leasing land for oil and gas production is described on pages 15 to 16.

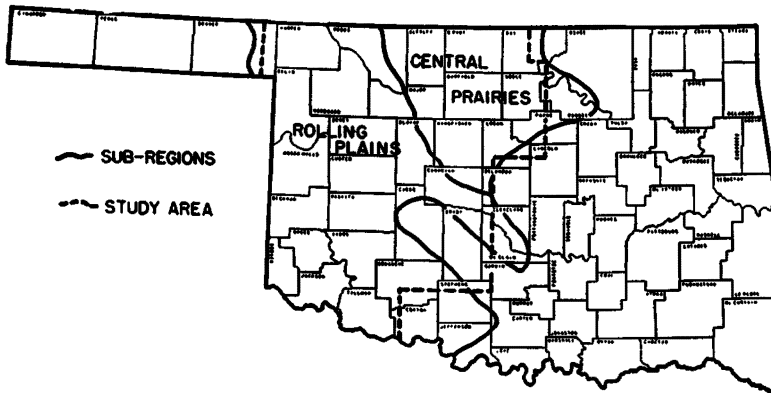


FIGURE 1.—Area Studied.

Map shows the area studied—23 counties and portions of 12 others. Income from leasing is recognized as an important part of the State's agricultural economy. Based on certain assumptions, it appears that investments in subsurface rights gave a better return than surface investments during the ten-year period, 1938-1947.

1938 to 1947. It varied from \$2,653,000 in 1942 to \$11,534,000 in 1944. The average subsurface income per acre for land under lease was \$1.50 per year.

3 Based on certain assumptions (discussed later), it appears that investments in subsurface rights gave a better return than did investments on the surface during the ten-year period 1938-1947. As an estimate, the subsurface returned about 6 percent on the investment whereas the return from the surface investment was about 5 percent.

These conclusions are based on a study of 23 complete counties and portions of 12 others. This area includes, roughly, 15,791,000 acres of land in farms. Obviously, all tracts in an area this size could not be studied without undue cost. Nor, for the same reason, could the entire legal history of each tract be studied. Therefore, a ten-year legal history of a sample consisting of more than a thousand quarter-section tracts was studied. This sample is believed to be fairly representative of the whole area.<sup>1</sup>

For persons interested in some particular part of the area studied, the information obtained is presented in the following

<sup>1</sup> A previous detailed study of one county, coupled with preliminary examination of the area studied here, indicated that the ten-year period 1938-47 was fairly representative of the history of leasing activity in the area. The sample tracts were so chosen that it is probable the data from them are representative of all tracts in the area. An explanation of the sampling technique will be furnished upon request.

pages by sub-areas as well as for western Oklahoma as a whole. These sub-areas (see Figure 2) include the following counties:

Sub-area 1: Blaine, Dewey, Ellis, Harper, Major, Woods, Woodward and part of Beaver.

Sub-area 2: Beckham, Custer, Roger Mills.

Sub-area 3: Greer, Harmon, Jackson, Kiowa, Tillman and parts of Comanche and Cotton.

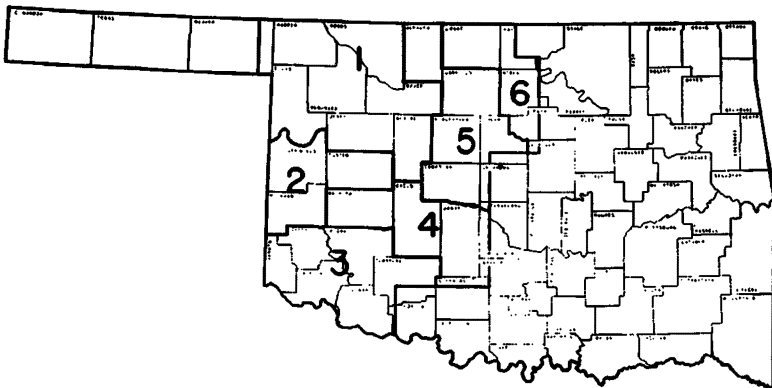
Sub-area 4: Caddo, Grady, Washita, and parts of Garvin, McClain and Stephens.

Sub-area 5: Alfalfa, Canadian, Garfield, Kingfisher, and parts of Logan and Oklahoma.

Sub-area 6: Grant and parts of Kay, Lincoln, Noble and Payne.

### Proportion of Land Leased

The first step in determining the income to western Oklahoma land from oil and gas leases was to find the proportion of the land under lease. This was done by studying the ten-year leasing history of each of the sample tracts. The proportion of the total acreage of these tracts that was leased each year was assumed to be the proportion of all acreage in the area leased each of the years.



**FIGURE 2.—Sub-Area Information.**

Mineral rights information obtained is presented by six sub-areas as shown on the map. Information by sub-areas, as well as for western Oklahoma as a whole, is given for persons interested in some particular part of the area studied.

Table I shows the acres under lease each year, and the year to year change. It is apparent that the proportion of land leased varies considerably from year to year, and between different areas in the same year. Figure 3 shows this graphically.

Leasing activity apparently is affected by the general economic situation, the same as any other business. The year 1942 was the low year in land leased, not only for the area but for nearly all the sub-areas. This probably was due to unsettled conditions the first year of the war. In 1943, increased demand for oil led to a sharp rise in leasing; and the taking of new leases reached a peak in 1944. After 1944, new leasing continued at a less rapid rate, but a greater proportion of older leases was kept in effect.

By 1947 nearly seven million acres were under lease in western Oklahoma. This compares with an annual average of slightly more than three million acres prior to 1940 and a low of a little more than two million in 1942. The ten-year average of acres leased is roughly four million acres, or 25 percent of the total land in farms in the area.

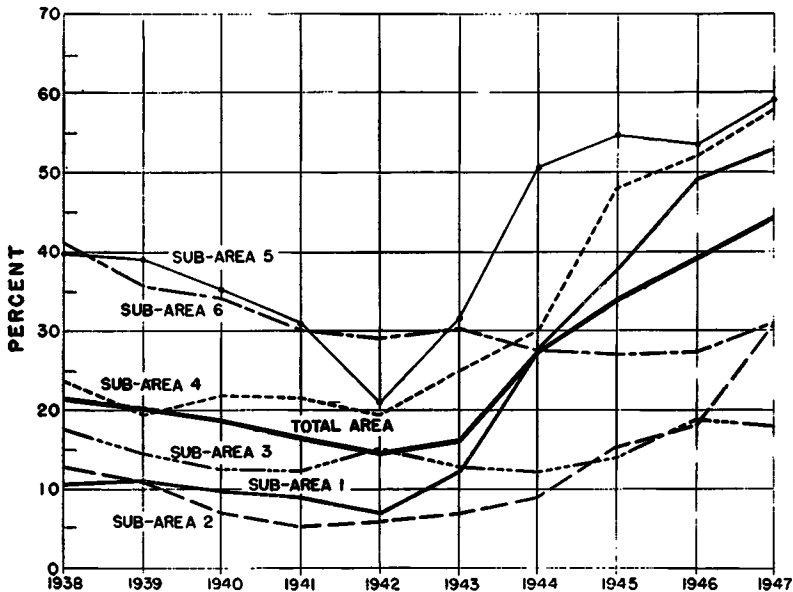


FIGURE 3.—Leasing Activity.

As in any other business, leasing activity apparently is affected by the general economic situation. Nearly seven million acres were under lease in western Oklahoma by 1947, as compared with the ten-year average of approximately four million acres. Leasing activity, as shown above, varies considerably between sub-areas.

Table 1.—Total Acres, Total Acres Leased by Years, and Acres Under New Lease Each Year, 1938-1947.

Year	Total acres	Percent leased	Acres leased	Percent under new lease	Acres under new lease	Leased acres released <sup>a</sup>
<b>Western Oklahoma</b>						
1938	15,793,320	21.52 <sup>1</sup>	3,398,499 <sup>a</sup>	8.9 <sup>1</sup>	303,670 <sup>a</sup>	502,962 <sup>a</sup>
1939		20.06	3,168,857	14.0	444,588	674,230
1940		18.25	2,881,943	10.3	299,045	585,959
1941		16.75	2,645,704	13.0	345,060	581,299
1942		14.47	2,284,745	16.7	380,646	741,605
1943		18.35	2,898,068	41.3	1,196,149	582,826
1944		26.95	4,256,542	48.1	2,046,577	688,103
1945		33.93	5,358,509	28.6	1,534,638	432,671
1946		39.02	6,161,770	18.7	1,151,257	347,996
1947		44.12	6,968,281	16.2	1,131,765	325,254
Average		25.34	4,002,292	22.1	883,336	546,290
<b>Sub-Area 1</b>						
(Blaine, Dewey, Ellis, Harper, Major, Woods, Woodward, and part of Beaver)						
1938	4,784,640	10.64	509,312	8.5	43,060	93,300 <sup>a</sup>
1939		11.05	528,666	19.7	104,325	84,970
1940		9.82	469,846	11.2	52,630	111,450
1941		8.94	427,626	9.0	38,275	80,495
1942		7.06	337,942	26.8	90,500	180,185
1943		12.09	578,472	48.8	282,294	41,765
1944		27.66	1,323,586	72.6	961,712	216,598
1945		38.08	1,819,410	33.1	602,864	107,040
1946		48.81	2,335,589	25.4	593,295	77,116
1947		53.04	2,537,586	11.1	282,294	80,297
Average		22.71	1,086,803	28.1	305,145	107,322
<b>Sub-Area 2</b>						
(Beckham, Custer, and Roger Mills)						
1938	1,828,000	12.72	232,590	2.4	5,485	41,685
1939		10.91	199,380	4.6	9,140	42,350
1940		7.23	132,230	8.3	10,970	78,120
1941		5.29	96,695	26.5	25,590	61,125
1942		6.20	113,360	33.7	38,250	21,585
1943		6.81	124,500	14.7	18,280	7,140
1944		9.20	168,160	57.6	96,885	53,225
1945		15.45	282,498	42.7	120,648	6,310
1946		18.80	343,597	39.4	135,272	74,173
1947		31.53	576,405	43.4	250,436	17,628
Average		12.41	226,942	31.3	71,095	40,334

Table I.—(Continued).

Year	Total acres	Percent leased	Acres leased	Percent under new lease	Acres under new lease	Leased acres released <sup>1</sup>
<b>Sub-Area 3</b>						
(Greer, Harmon, Jackson, Kiowa, Tillman, and parts of Comanche and Cotton)						
1938	2,827,000	17.91	506,287	15.6	79,150	84,469
1939		14.79	418,253	9.5	39,578	127,612
1940		12.69	358,844	6.3	22,615	82,024
1941		12.75	360,525	19.1	68,945	67,264
1942		15.14	428,000	21.8	93,291	25,816
1943		12.45	351,973	14.4	50,885	126,912
1944		12.14	343,075	24.7	84,810	93,708
1945		14.00	395,673	27.9	110,250	57,652
1946		18.72	529,091	36.3	192,235	58,817
1947		17.84	504,332	23.5	118,735	143,494
Average		14.84	419,605	20.5	86,050	86,777
<b>Sub-Area 4</b>						
(Caddo, Grady, Washita, and parts of Garvin, McClain, and Stephens)						
1938	2,339,000	23.14	541,223	5.6	30,405	124,894
1939		19.83	463,707	15.6	72,510	150,026
1940		22.21	519,492	21.2	110,340	54,455
1941		21.91	512,398	12.7	65,170	72,364
1942		19.31	451,364	9.3	42,100	103,134
1943		25.11	587,268	33.0	194,140	58,236
1944		29.68	693,158	29.4	203,495	97,605
1945		47.67	1,114,899	44.9	500,546	78,805
1946		51.77	1,210,979	13.5	163,730	67,650
1947		58.16	1,360,423	11.7	159,050	9,606
Average		31.87	745,501	20.7	154,149	81,678
<b>Sub-Area 5</b>						
(Adalfa, Canadian, Garfield, Kingfisher, and parts of Logan and Oklahoma)						
1938	2,649,640	39.73	1,052,592	10.1	105,985	113,030
1939		39.28	1,040,756	15.3	158,975	170,811
1940		35.26	934,373	6.6	61,540	167,923
1941		31.02	821,997	9.8	80,640	193,016
1942		21.04	557,608	8.1	45,045	309,434
1943		31.68	839,476	68.5	574,970	293,102
1944		51.06	1,352,877	46.8	633,265	119,864
1945		54.55	1,445,306	10.1	145,730	53,301
1946		53.33	1,412,976	3.6	50,345	82,675
1947		58.81	1,558,130	13.4	209,320	64,166
Average		41.58	1,101,609	18.8	206,580	156,732

Table I.—(Continued).

Year	Total acres	Percent leased	Acres leased	Percent under new lease	Acres under new lease	Leased acres released <sup>1</sup>
<b>Sub-Area 6</b>						
(Grant and parts of Kay, Lincoln, Noble and Payne)						
1938	1,365,040	40.77	556,493	7.1	39,585	45,586
1939		37.95	518,096	11.6	60,060	98,457
1940		34.22	467,056	8.8	40,950	91,990
1941		31.24	426,463	15.6	66,440	107,033
1942		29.04	396,470	18.0	71,460	101,453
1943		30.50	416,382	18.2	75,580	55,668
1944		27.52	375,686	17.7	66,410	107,106
1945		26.19	357,478	15.3	54,600	72,808
1946		26.21	357,769	4.6	16,380	16,089
1947		31.60	431,404	25.9	111,930	38,295
Average		31.52	430,330	14.0	60,340	73,448

<sup>1</sup> Calculated—New leases plus previous year's land leased minus current year's land leased.

<sup>2</sup> Total of all sub-areas.

<sup>3</sup> Calculated for each sub-area—New leases plus previous year's land leased minus current year's land leased.

That the leasing picture varies considerably between sub-areas within western Oklahoma can be seen by a study of Table I and Figure 3. In sub-area 1, the proportion of land leased averaged about 23 percent during the 10-year period. However, during the final two years the average was above 50 percent. The upward trend, when coupled with oil industry reports, indicates that the proportion leased may remain above 50 percent for some years to come.

The 10-year average of land leased in sub-area 2 was slightly more than 12 percent of all farmland. The highest proportion leased during any one year was 31.5 percent in 1947. However, leasing activity which began in 1948 sharply increased the acreage under lease in this area. The activity has continued to the present.

Sub-area 3 had a 10-year average of about 15 percent of the land in farms under lease. The highest proportion under lease during any one year was 18.7 percent in 1946. Leasing in this sub-area is noted chiefly for the uniformity of the proportion leased each year. There has been a recent increase in leasing activity in the northern part of the area which borders sub-area 2. The indications are that for the next few years, at least, a fair proportion of the land is likely to be under lease in these two areas.

Sub-area 4 had an average of roughly one-third of the farmland under lease during the 10-year period. In only two years did the



acreage leased fall below one-fifth of the land in farms. However, during the final three years of the period, the average under lease was above 50 percent.

Sub-area 5, with an average of nearly 42 percent under lease each year of the period, had the best leasing record of all the sub-areas. A majority of the land in farms was under lease the last four years of the 10-year period. The average for the last half of the 10-year period closely approached 50 percent when 49.9 percent was under lease.

In sub-area 6, the amount of land under lease was relatively stable during the period. The average for the ten-years shows nearly one-third of the land leased each year. While there has been a downward trend in land leased in this sub-division, the trend has been slight and the proportion leased still remains substantial.

### Income from Leasing and Bonuses

The proportion of land under lease means very little until translated into income. The next step in the study, therefore, was to get figures on the amounts which oil companies paid to landowners in the way of delay rentals and bonuses. With this information, it was possible to multiply the number of acres under lease by the lease payments per acre and get a figure on the income landowners received from leasing. The results are shown in Table II.

In securing information on income from leasing, the principal difficulty was in obtaining an estimate of bonus payments.<sup>2</sup> Only infrequently is a bonus mentioned in the lease contract on file in public records. For this reason the bonus figure used in this study was based on opinions and such factual data as could be obtained from lease scouts, oil companies, the U. S. Geological Survey Office at Oklahoma City, and the Oklahoma School Land Commission.<sup>3</sup> The bonus figures used here are estimated composite figures reached after careful consideration of the available factual data, and tempered by the opinions obtained. It is believed that they are as close to an average or "normal" bonus as can be obtained. Some landowners will obtain bonuses much larger than the figures used; a few will obtain less. The lease scouts interviewed for this study reported that bonuses usually range from \$1 to \$15 per acre, with a majority falling in the lower portion of the range.

<sup>2</sup> The place of the bonus payment in the leasing system is described in the section of this bulletin on page 16.

<sup>3</sup> The School Land Commission, in particular, has a great deal of factual data on file in the form of bids on school land leases. However, school land lease sales are held only upon request of a prospective lessee. Such a request causes the School Land Commission to advertise the tracts as open for lease which in effect is public notice that someone believes the tract is valuable for oil and gas. Competition is thereby stimulated and bids usually go higher than for bonuses ordinarily paid in the locality. For this reason data obtained from this source must be used with caution.

Table II.—Total and Per Acre Income from Leasing and Bonuses. 1938-1947.

Year	Lease Income		Bonus Income		Total Income	
	Per acre <sup>a</sup> (dollars)	Area (dollars)	Per acre <sup>b</sup> (dollars)	Area (dollars)	Per Acre <sup>c</sup> (dollars)	Area (dollars)
<b>Western Oklahoma<sup>d</sup></b>						
1938	.89	2,739,053	4.25	1,289,084	1.18	4,028,137
1939	.90	2,458,150	3.25	1,455,503	1.24	3,913,653
1940	.92	2,383,183	2.50	755,009	1.09	3,138,192
1941	.89	2,036,437	3.65	1,262,273	1.25	3,298,710
1942	.87	1,660,686	2.60	992,549	1.16	2,653,235
1943	.91	1,554,727	5.60	6,712,917	2.85	8,267,644
1944	.97	2,132,993	4.60	9,400,782	2.71	11,533,775
1945	.97	3,706,729	4.10	6,330,249	1.87	10,036,978
1946	.96	4,819,433	4.30	4,986,745	1.59	9,806,178
1947	.98	5,743,050	4.40	4,985,227	1.54	10,728,277
<b>Average</b>	<b>.93</b>	<b>2,900,626</b>	<b>3.53</b>	<b>3,115,646</b>	<b>1.50</b>	<b>6,016,272</b>
<b>Sub-Area 1</b>						
(Blaine, Dewey, Ellis, Harper, Major, Woods, Woodward, and part of Beaver)						
1938	.89	414,964 <sup>e</sup>	1.50	64,590 <sup>e</sup>	.94	479,554 <sup>f</sup>
1939	.87	369,177	1.50	156,488	.99	525,665
1940	.98	408,872	1.25	65,787	1.01	474,659
1941	.89	346,522	1.50	57,413	.94	403,935
1942	.86	212,800	1.25	113,125	.96	325,925
1943	.82	242,866	2.50	705,735	1.64	948,601
1944	.95	343,779	2.75	2,644,708	2.26	2,988,487
1945	.95	1,155,719	3.50	2,110,024	1.79	3,265,743
1946	.96	1,672,602	4.00	2,373,180	1.73	4,045,782
1947	.98	2,210,186	4.00	1,129,176	1.32	3,339,362
<b>Average</b>	<b>.92</b>	<b>719,125</b>	<b>2.25</b>	<b>686,576</b>	<b>1.29</b>	<b>1,405,710</b>
<b>Sub-Area 2</b>						
(Beckham, Custer, and Roger Mills)						
1938	.79	179,413	1.50	8,227	.81	187,640
1939	.80	152,192	1.50	13,710	.83	165,902
1940	.83	100,646	1.50	16,455	.89	117,101
1941	.86	61,150	2.50	63,975	1.29	125,125
1942	.86	64,595	2.50	95,625	1.41	160,220
1943	.88	93,474	3.00	54,840	1.19	148,314
1944	.85	60,584	2.50	242,212	1.80	302,796
1945	.89	144,047	2.50	301,620	1.58	445,667
1946	.92	191,659	3.50	473,452	1.94	665,111
1947	.94	306,411	3.50	876,526	2.05	1,182,937
<b>Average</b>	<b>.86</b>	<b>134,028</b>	<b>2.25</b>	<b>159,964</b>	<b>1.30</b>	<b>293,992</b>

Table II.—(Continued).

Year	Lease Income		Bonus Income		Total Income	
	Per acre <sup>a</sup> (dollars)	Area (dollars)	Per Acre <sup>a</sup> (dollars)	Area (dollars)	Per Acre <sup>a</sup> (dollars)	Area (dollars)
<b>Sub-Area 3</b>						
(Greer, Harmon, Jackson, Kiowa, Tillman, and parts of Comanche and Cotton)						
1938	.92	392,966	4.00	316,600	1.40	709,566
1939	.96	363,528	2.50	98,945	1.10	462,473
1940	.93	312,693	3.50	79,152	1.09	391,845
1941	.88	256,590	4.00	275,780	1.46	532,370
1942	.93	311,279	2.00	186,582	1.16	497,861
1943	.92	277,001	3.50	178,097	1.29	455,098
1944	.98	253,100	4.50	381,645	1.85	634,745
1945	1.00	285,423	4.50	496,125	1.98	781,548
1946	1.01	340,225	4.50	865,058	2.28	1,205,283
1947	1.01	389,453	4.00	474,940	1.71	864,393
Average	.95	316,877	3.50	301,175	1.47	618,052
<b>Sub-Area 4</b>						
(Caddo, Grady, Washita, and parts of Garvin, McClain, and Stephens)						
1938	.94	480,169	5.00	152,025	1.17	632,194
1939	.96	375,549	2.50	181,275	1.20	556,824
1940	.98	401,067	2.50	275,850	1.30	676,917
1941	1.00	447,228	2.50	162,925	1.19	610,153
1942	.98	401,079	4.50	189,450	1.31	590,529
1943	.98	385,265	5.00	970,700	2.31	1,355,965
1944	.99	484,766	5.00	1,017,475	2.17	1,502,241
1945	1.00	614,353	5.00	2,502,730	2.80	3,117,083
1946	1.00	1,047,249	6.00	982,380	1.68	2,029,629
1947	1.00	1,201,373	6.00	954,300	1.58	2,155,673
Average	.98	579,525	4.50	693,671	1.71	1,273,196
<b>Sub-Area 5</b>						
(Alfalfa, Canadian, Kingfisher, and parts of Logan and Oklahoma)						
1938	.83	785,684	5.00	529,925	1.25	1,315,609
1939	.87	767,150	5.00	794,875	1.50	1,562,025
1940	.87	759,365	3.50	215,390	1.04	974,755
1941	.83	615,327	5.00	403,200	1.25	1,018,527
1942	.77	394,674	3.50	157,657	.99	552,331
1943	.93	245,991	7.50	4,312,275	5.43	4,558,266
1944	.99	712,416	7.50	4,749,487	4.04	5,461,903
1945	.95	1,234,597	5.00	728,650	1.36	1,963,247
1946	.92	1,253,621	5.00	251,725	1.06	1,505,346
1947	.99	1,335,322	5.00	1,046,600	1.53	2,381,922
Average	.90	805,526	5.00	1,032,900	1.67	1,838,426

Table II.—(Continued).

Year	Lease Income		Bonus Income		Total Income	
	Per acre <sup>a</sup> (dollars)	Area (dollars)	Per Acre <sup>b</sup> (dollars)	Area (dollars)	Per Acre <sup>c</sup> (dollars)	Area (dollars)
<b>Sub-Area 6</b>						
(Grant and parts of Kay, Lincoln, Noble and Payne)						
1938	.94	485,893	5.50	217,717	1.26	703,610
1939	.94	430,554	3.50	210,210	1.24	640,764
1940	.94	400,540	2.50	102,375	1.08	502,915
1941	.86	309,620	4.50	298,980	1.43	608,600
1942	.85	276,259	3.50	250,110	1.33	526,369
1943	.91	310,150	6.50	491,270	1.92	801,400
1944	.90	278,348	5.50	365,255	1.71	643,603
1945	.90	272,590	3.50	191,100	1.30	463,690
1946	.92	314,077	2.50	40,950	.99	355,027
1947	.94	300,305	4.50	503,685	1.86	803,990
Average	.91	336,690	4.00	241,360	1.34	578,051

<sup>1</sup> Total of the six sub-areas.

<sup>2</sup> Lease income divided by Acres on which rent was paid.

<sup>3</sup> Total Bonus income divided by total of new leases taken.

<sup>4</sup> Total income divided by total acres under lease.

<sup>5</sup> Computed by applying per acre income to acres leased minus acres under new lease as shown in table on leasing for the sub-areas.

<sup>6</sup> Per Acre income estimated and applied to acres of new leases as shown in table on leasing for the sub-areas.

<sup>7</sup> The total of lease income plus bonus income.

Lease rent in western Oklahoma as a whole averaged 93 cents per acre over the 10-year period studied. The average lease rent income in the area was \$2,900,626 per year.

The estimated bonus income for the area averaged \$3,115,646 per year, or \$3.53 per acre for new leases.

Total income for the area as a whole averaged \$6,016,272 per year for the period, or \$1.50 per acre for all land leased; almost equally divided between lease rentals and bonuses.

The highest income year was 1944. Lease rents and bonuses that year totaled \$11,533,775, about 80 percent of which came from bonuses. However, on per acre basis, income in 1944 was exceeded by that in 1943, when the average per acre income amounted to \$2.85 on the acreage under lease. The low point in total income during the period occurred in 1942 when slightly more than \$2,653,000 were received by landowners, roughly two-thirds coming from lease rentals.

It should be pointed out that these amounts accrued to land leased. In sub-areas 2 and 3, more than half the land was not

*Table III.—Estimated Relationship of Income to Land from Oil Leasing and from Agriculture in Western Oklahoma.\**

	1939	1944	Average
Income from oil leases	\$ 3,914,000	\$11,534,000	\$ 7,724,000
Net return from agriculture	12,151,000	30,427,000	21,289,000
Total income to land	16,065,000	41,961,000	29,013,000
Percent from oil leases	24.4	27.5	26.6
Assumed Investment			
In Land	383,757,000	436,209,500	409,983,450
In Mineral Rights	78,966,600	172,463,000	125,714,800
Percent return on investment			
From oil leases	5.0	6.7	6.1
From agriculture	3.2	7.0	5.2

\* For basis of estimates, see Appendix.

leased at all during the ten-year period studied. In sub-areas 1 and 6, more than a fourth of the land was not leased during the period. For western Oklahoma, as a whole, 38 percent of the land was not leased at any time during the ten-year period.

#### Relative Income from Surface and Subsurface

After the subsurface income figures shown in Table II were calculated, an effort was made to compare them with income from farming and ranching in the same area. The comparison had to be based on the years 1939 and 1944, because these are the only years within the period studied for which agricultural income figures for the area are available.

Results of the comparison are shown in Table III.<sup>4</sup> It must be remembered that some of these figures are only estimates. However, they were arrived at after careful consideration of all the data available, and it is believed that the relationships shown are reasonably accurate. At least, it seems clear that return to the land from undeveloped mineral rights is an important element in land income in western Oklahoma. Income from the subsurface apparently was about one fourth of the total income to land in that area for the ten years studied, 1938 to 1947.

It also appears that for the 10-year period the percentage of return on the investment is somewhat better from the subsurface than from the surface, even without considering the value of any oil produced. This is perhaps as it should be since the risk in ownership of subsurface rights probably is greater than the risk involved in an investment on the surface.<sup>5</sup> Therefore, a higher

<sup>4</sup> Methods of calculating the comparisons shown in Table III are described in the Appendix, page 17.

<sup>5</sup> It should be noted that the figures for "percent return on investment" in Table III are an average for all landowners in the area studied.

rate of return to the subsurface investor would be necessary to encourage such investments if a fair rate of return were the only factor governing such investments. As a matter of fact, investments made solely in subsurface rights usually are speculative, and a return from the actual production of oil and gas is the primary consideration rather than a return to the undeveloped subsurface rights.

### Leasing Procedure

Most landowners have neither the finances nor the skill required to explore for and produce the oil and gas that might be found under their land. Therefore, landowners are generally willing to lease their land for this purpose to an oil company or operator equipped to explore for, produce, and market petroleum.

Most oil and gas leases are written to cover either a five or a ten-year period. The lessee may commence actual drilling any time during this period. However, practically all leases provide that unless drilling is started within a year after the lease is made the lessee will forfeit the lease unless he pays an amount stated in the contract to keep it in force. This payment is called a delay rental. The delay rental, as the name implies, is simply a payment to the landowner for the right to delay drilling for another year. The operator may make these delay rental payments for the life of the lease.

The privilege of paying delay rental is a convenience to oil operators who do not wish to begin drilling within the first year of the lease. There may be any number of reasons for the delay. The lessee may want to explore further the possibilities of getting oil if a well is sunk, since drilling an oil well is a costly venture. The lessee may wish to wait for higher oil prices, or he may not be able to get required equipment. Still, the possibilities of finding oil are great enough that the lessee may be willing to continue delay rental payments in order to keep the lease. It is for this reason that a considerable proportion of land is constantly under lease in Oklahoma.

As a rule, one dollar per acre is paid as a delay rental on land under lease. This may vary, however. In the early 1930's when conditions were depressed, many new lease contracts were made at 50 cents per acre rental.

Even in more prosperous periods, some leases will be made which call for a delay rental of less than one dollar per acre. Land less favorably situated in relation to known promising geological formations frequently will be leased only at a reduced rate. It is for these reasons that the average rental rate is less than one dollar.

Since it is seldom that the rental rate goes above one dollar per acre, some adjustment usually is made to a landowner whose holdings lie in favorable territory in order to persuade him to sign the lease. This adjustment is in the form of a bonus, which is an additional payment made to the landowner at the time the lease contract is made.

The bonus is a particularly elusive thing to isolate; one may or may not be paid. Whether a bonus is paid and the size of the payment depends on many things: the general demand for leases in the area, the economic position of the landowner, and the location of the tract in relation to known favorable geological formations.

In general, competition for leases is the dominant factor in setting the bonus. Competition usually is sharp when some lessee attempts to lease all land within a locality.\* Competition also is strong in the vicinity of a "wildcat" well while it is being drilled. Even though the "wildcat" may not discover oil, favorable geological formations may be found, and this stimulates competition for leases. Bonuses may, therefore, range from nothing to several hundred dollars per acre. However, the lease scouts interviewed during this study reported that bonuses more commonly range from \$1 to \$15 per acre, with \$5 being the figure most often quoted. Such bonuses are of frequent enough occurrence that the individual landowner may have reasonable expectations of receiving a bonus when he leases his land.

The data presented earlier in this bulletin show that, over a period of years, bonus income is larger than lease income in most areas. It is a particularly important source of income during periods of great leasing activity when competition for leases is sharp. It is during these periods that lump sum payments are large enough to permit landowners to retire mortgage debts, make needed farm improvements, or to buy necessary equipment. Under more ordinary conditions, lease rentals are a source of supplemental income which is often large enough to pay real estate taxes.

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\* This is referred to as a lease block and individuals are particularly eager to lease land within the block, usually with the idea of reselling at a profit to the lessee who is attempting to establish the block.

## APPENDIX

### Method of Computing Agricultural Income Figures Used in Preparing Table III

Cash income from crops in the area as reported by the census<sup>1</sup> totaled roughly \$46,765,000 in 1939 and \$121,455,000 in 1944. In view of the fact that wheat and cotton are, by far, the predominant cash crops of the area, it was assumed that all crop income came from these two crops. The total crop income was divided arbitrarily according to the cash income relationship that wheat and cotton held to each other in those two years. In 1939, 70 percent of the cash income from these two commodities was from wheat; 30 percent from cotton. In 1944, 67 percent of the cash income from these two commodities was from wheat, 33 percent was from cotton.

Divided in this manner, calculations show that in 1939 wheat income amounted to \$32,735,500,<sup>2</sup> and cotton income was \$14,080,150. In 1944, wheat income was \$81,374,850,<sup>3</sup> and cotton income was \$40,080,150. However, cash income from crops is not net income to the farm.

Therefore, for crop income, it was assumed that the normal crop share going to the landlord represents landlords' gross return from land due to crop production. According to figures compiled by the United States Department of Agriculture, estimated landlord expenses comprise about 36 percent of the gross rent income to landlords in the United States.<sup>4</sup>

In 1939, the calculated wheat income amounted to \$32,735,500 in the area. One-third of this amount normally goes to landlords. Their gross return from wheat was, therefore, about \$10,912,000. Cotton income in 1939 was calculated to be \$14,029,500, of which one-fourth normally goes to landlords. The landlords' gross return was \$3,507,000 from cotton. The estimated gross return to landlords from crops totaled \$14,419,000 in 1939.

Apparently the most accurate estimation of net income to land from livestock production would be a calculated figure based on the normal rent received from pasture. There are approximately 6,525,000 acres of land used for pasture in the area. Over the area as a whole it requires about 10 acres of pasture to support one animal unit. The going rate over the area is one dollar per animal

<sup>1</sup> *United States Census of Agriculture, 1945, Department of Commerce, Bureau of the Census, Vol. 1, Part 25.*

<sup>2</sup> Seventy percent of \$46,765,000, the total crop income.

<sup>3</sup> Sixty-seven percent of \$121,455,000, the total crop income.

<sup>4</sup> Five-year average, 1938-1942, *Agricultural Statistics, 1943, Table 499, p. 412, U. S. Department of Agriculture, Washington, D. C.*



unit per month. The normal grazing season is seven months. Therefore, the return to landlords from pasture rent is approximately \$4,567,500. This amount added to crop income gave a gross return to landlords of \$18,986,500. The net return to the land, then, would be 36 percent less than this amount or \$12,151,360 from agricultural production in the area in 1939.

Over the area as a whole, there is a probability that landowners' investments in mineral rights could have been liquidated at an average of about \$5.00 per acre in 1939. The only factual data available which shows the selling price of land in the area, with mineral rights and without, are for counties with a considerable amount of oil production.<sup>6</sup> In these counties, land conveying one-half or more of the mineral rights sold for about \$10.00 per acre more than did land with none of the mineral rights. There is much land in the study area where mineral rights would have sold for considerably more than \$5 per acre; there probably is more land where the subsurface rights could have been sold only if the selling price had been very low.<sup>6</sup> If, however, it be assumed that \$5.00 per acre is a fair average, then all mineral rights in the study area would have sold for a total of \$78,966,600 in 1939. The return to this investment was \$3,914,000, or about 5 percent for that year.

The census value of farms in the area in 1940 as approximately \$462,724,000.<sup>7</sup> From this figure the assumed value of the subsurface is deducted, leaving \$383,757,400 as the estimated value of surface realty. The net return to land from agriculture was estimated at \$12,151,000 in 1939 or 3.2 percent return to the investment in the surface.

In 1944, cash income from crops was roughly \$121,455,000. Using the same procedure for calculating as before, it is found that the gross return to the landlords from crops was \$37,144,985.

There are reasons for believing that pasture rent was about 25 percent higher in 1944 than in 1939. This means that roughly \$5,709,400 were received for pasture rent in 1944. This amount added to the gross return from crops gives a gross return to landlords of \$42,854,000 from agriculture. The net return to land is calculated to be \$30,427,000.<sup>8</sup>

<sup>6</sup> Grady and Payne Counties. Davidson, R. D. and Parcher, L. A., *The Influence of Mineral Rights on Transfers of Farm Real Estate in Oklahoma*. Okla. Agri. Exp. Sta. Bul. No. B-278, Feb. 1944.

<sup>6</sup> It must be remembered that reluctance of a buyer to buy land without complete title, and reluctance of some sellers to convey all mineral rights when conveying land, makes the transfers of mineral rights contingent on something more than the economic value of those rights.

<sup>7</sup> *Census of Agriculture*. *Op. Cit.*

<sup>8</sup> Twenty-nine percent of the gross income. This is the average for the United States for the years 1943-46. *Agricultural Statistics, 1947*, U. S. Department of Agriculture, Table 644, p. 543.

Subsurface income in 1944 was \$11,534,000. This amount is 27.5 percent of the total net return to land from both the surface and subsurface. It is probable that in 1944 investments in subsurface rights must be reckoned at a figure higher than in 1939. It is difficult to say how much higher, but returns to land from oil and gas leasing activity are so direct that an increase in lease income may be capitalized into value rather quickly. It is possible, therefore, that the increased values can be estimated with some degree of accuracy. The per acre returns to land from leases and bonuses in 1944 were 118.5 percent greater than in 1939. Assuming that market values for mineral rights increased by something like that amount between 1939 and 1944, the estimated value of mineral rights in 1944 was \$10.92 per acre, with a total of mineral rights in the area of \$172,463,000. An \$11,534,000 return gave a 6.7 percent yield on this investment.

The census reported value of land and buildings in 1944 was \$608,672,400 in the area. If from this is taken the assumed value of subsurface rights, there remains \$436,209,500 invested in the surface. The return to the surface from agriculture, calculated to be \$30,427,000, is a 7.0 percent yield on the investment.

Although year-to-year agricultural income and value figures for the area are lacking, it may be that an average of the two years, 1939 and 1944, can be taken as representative of the whole 10-year period, 1938-1947. On this basis, the average net income to land from agriculture is calculated to be \$21,289,000; the average value of the surface, \$409,983,450. The average income gave a 5.2 percent return on the average investment.

The average investment in subsurface rights, assuming 1939 and 1944 are representative of the 10-year period, was \$125,714,800. The average income for the two years was \$7,724,000, or a 6.1 percent return on the investment. Returns to the subsurface were 26.6 percent of the net cash return to land from both surface and subsurface.