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WINTER WHEAT PRODUCTION COSTS

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WINTER WHEAT PRODUCTION COSTS

Nebraska, 1948

Arthur G. George, Department of Rural Economics*

Average costs per bushel to produce winter wheat in Nebraska in 1948 were as follows:

Cass	88 ¢	Saunders	92 ¢
Douglas	95 ¢	Cheyenne	80 ¢
Fillmore	99 ¢	Perkins	59 ¢

These data were obtained from 141 farmers who submitted records to the Nebraska College of Agriculture covering operations on their 1948 winter wheat crops. Similar records have been obtained from these same counties for about 20 years.

Figures for the different counties appear in Tables 1 to 6. Each table shows three columns of figures. The first column gives average figures for the records obtained from a county, the second and third columns give average figures for the approximate one-third of the records having lowest and highest costs per bushel, respectively. These records include no direct charge for the use of land, and acre costs as given take no account of this item. Costs per bushel, however, indirectly include a land charge since the given cost items are charged entirely to the tenant's share of the crop. For purposes of this study the usual share rent was deducted from the total winter wheat production on land operated by owners and the tenant's share used in computing bushel costs.

The winter wheat records were obtained from three areas which differ as to soil conditions, rainfall and extent of winter wheat operations. Cass, Douglas, and Saunders counties represent conditions of one type, Fillmore county of another type, and Cheyenne and Perkins counties of still another type. For purposes of this discussion, the first two groupings mentioned will be treated as eastern counties and the last grouping as western counties.

Average costs per bushel to produce winter wheat were 94 cents in the eastern counties compared with 70 cents in the western counties. Acre costs for the two groups, other than use of land, averaged $14.26 in the east and $11.50 in the west. Yields per acre were almost equal within the two groups, 25.9 bushels per acre in eastern counties, and 25.8 bushels per acre in those from the west.

Average costs per acre for labor, power and "other" were greater in the eastern counties but less for equipment than in the western counties. The following table shows some of the differences in winter wheat costs between the eastern and western counties.

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*The Department of Rural Economics and the Agricultural Extension Service of the Nebraska College of Agriculture and interested wheat growers.

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Counties	Costs per bushel	Bushel yields per acre	Costs per acre: Labor	Power	Equipment	Other	Total	Hours per acre: Man	Horse	Tractor
Eastern	$.94	25.9	$3.45	$3.19	$3.14	$4.48	$14.26	3.36	.17	3.18
Western	$.70	25.8	$2.74	$2.82	$3.37	$2.57	$11.50	2.20	[illegible]	1.97

Abandonment of winter wheat acreage seeded on the farms of the record keepers in the eastern counties was 5.1 per cent but in the western counties it was only three per cent. The record keepers from Cass, Douglas, and Perkins counties reported no abandonment. Flood damage and dry weather accounted for the abandonment in the eastern counties, while hail was the cause of abandonment in Cheyenne county. There was considerable hail damage to winter wheat on farms of record keepers in Cheyenne county, but such damage was much less extensive on the farms of record keepers in Perkins county. Several record keepers from Cheyenne county reported very low wheat yields on fields which had been hailed out during the previous year.

The total winter wheat acreage covered by 106 records in the eastern counties was 6,698.25, and in the western counties 35 records covered 10,565.5 acres. Continuous cropping was the rule in eastern counties, but the records from the western counties covered only summer fallowed wheat. In that area, very little non-fallowed wheat is grown.

Average costs per bushel in the four eastern counties as shown in Tables 1 to 4 were Cass 88 cents, Douglas 95 cents, Fillmore 99 cents, and Saunders 92 cents. The average shares per acre received by the tenants in these counties were 16.6 bushels, 16.2 bushels, 13.2 bushels, and 16.1 bushels, respectively. Differences in average costs per bushel between the different counties were due to differences in costs per acre and in the tenant's share of the yields per acre. In Fillmore county, the advantage of a lower cost per acre was more than offset by a much lower average yield per acre.

Abandonment of seeded winter wheat acreage among the record keepers was 7.8 per cent in Fillmore county and 3.3 per cent in Saunders county.

The figures for each of the low-cost groups of the four eastern counties show a lower average cost per acre and a higher average share of the yield per acre for the tenant than those for the corresponding high-cost groups. Higher yields and lower acre costs resulted in lower bushel costs for the low-cost groups than for the high-cost groups.

Ground preparation for winter wheat production in the eastern counties usually consisted of plowing, disking and harrowing. There was considerable variation in the depth of plowing, but the following depths were most frequently reported by the record keepers from each of the eastern counties: Cass 6 inches, Douglas and Fillmore 5 1/2 inches, and Saunders 6 1/2 inches.

In the two western counties, average costs per bushel to produce winter wheat were, Cheyenne 80 cents and Perkins 59 cents (Tables 5 and 6). The tenant's share of the crop showed average yields per acre for these two counties of 14.7 bushels and 19.8 bushels, respectively. An average of the Perkins county records gave a slightly higher acre cost than did the Cheyenne county records, but the higher average share received by the tenant in Perkins county was mainly responsible for the lower bushel cost of that county.

Abandonment of seeded winter wheat acreage on the farms of the record keepers was 5.5 per cent in Cheyenne county with none in Perkins county. In Cheyenne county, the low-cost group had no abandoned wheat acreage and the average share received by the tenant was 22.2 bushels per acre. These were the chief reasons for a lower average cost per bushel than for the high-cost group where there was considerable abandonment and the average share received by the tenant was 8.7 bushels per acre. The disadvantage of a higher acre cost for the low-cost group was more than offset by the higher average yield per acre when compared with the high-cost group.

In the case of Perkins county when comparing the low-cost and high-cost groups we find the former had a lower average acre cost and a higher average share per acre for the tenant which would account for the lower cost per bushel of this group.

Seed bed preparation on the farms of the Cheyenne county record keepers was somewhat different than the practices followed by the record keepers in Perkins county. In Cheyenne county the initial operation was to use mold board plows on 32 per cent of the acreage seeded to wheat, 56 per cent was worked with one-way disks initially and 12 per cent with subsurface tillers. The initial operations were usually followed by one-way disking, tandem disking and rod weeding. In Perkins county only 8 per cent of the wheat ground was plowed and one per cent initially worked with a subsurface tiller. Ninety-one per cent of the acreage was initially worked with one-way disks. In general, subsequent operations during the summer consisted of one-waying, disking, and rod weeding. In several instances tillers or spring tooth harrows were used instead of disks.

A marked change in the labor requirements to produce an acre of winter wheat is noted in the eastern counties during the past 20 years with little, if any, change during that period on summer-fallowed winter wheat in the western counties. The lack of significant change in the western counties may be due to the employment of more tillage operations on account of greater rainfall during the last decade than during the one preceding. This would tend to offset the labor saving advantages of larger machines and more efficient tractors which have generally come into use during the past ten years. The change in the eastern counties was doubtless due to increased mechanization and use of larger machines. These changes are indicated in the following tabulation:

Hours of man labor required to produce an acre of winter wheat.*

County	Average hours per acre, 10-year periods		Remarks
	1929-1938	1939-1948	
Cass	7.1	4.1	
Douglas	8.8	4.9	
Fillmore	5.4	3.0	
Saunders	7.1	3.9**	
Cheyenne	2.6***	2.2	Summer fallow
Perkins	2.0	2.2	Summer fallow

*From cost of winter wheat production records obtained by the Nebraska College of Agriculture.
**Nine year average. No records for 1945.
***Nine year average. No records for 1929.

Another item is perhaps significant in that in all counties except one the average yield per acre of winter wheat was greater during the past decade than during the one immediately preceding. This was especially significant in the western counties. This increase in yields per acre might be due to one or more of several causes such as more favorable weather conditions, selection of better adapted varieties, improved cultural practices or perhaps other reasons. The data follow:

Average winter wheat yields by counties, Nebraska*

County	Average yields per acre, 10-year periods		Remarks
	1929-1938	1939-1948	
	Bushels	Bushels	
Cass	21.6	20.6	
Douglas	20.1	24.6	
Fillmore	14.9	16.8	
Saunders	19.3	21.5**	
Cheyenne	17.7***	25.7	Summer fallow
Perkins	14.4	26.4	Summer fallow

*From cost of winter wheat production records obtained by the Nebraska College of Agriculture.
**Nine year average. No records for 1945.
***Nine year average. No records for 1929.

Table 1. Cost of producing winter wheat on 26 farms, Cass county, Nebraska, 1948.

Item	Your farm	Average of 26 farms	10 low-cost farms	10 high-cost farms
NUMBER OF FARMS		26	10	10
LABOR AND POWER PER ACRE: HOURS				
To harvest				
Man		2.52	2.13	3.07
Tractor		2.52	2.13	3.07
For harvest				
Man		1.10	1.03	1.27
Tractor		1.10	1.03	1.27
Total				
Man		3.62	3.16	4.34
Tractor		3.62	3.16	4.34
COSTS PER ACRE				
Labor		$3.80	$3.62	$4.07
Power		$3.46	$3.20	$3.71
Equipment		$3.21	$3.19	$3.17
Other		$4.18	$3.94	$4.40
TOTAL COSTS PER ACRE*		$14.65	$13.95	$15.35
ACRES IN WHEAT		39.7	50.2	35.1
YIELDS PER ACRE: BUSHELS				
Average		28.1	32.4	21.1
Tenant's Share		16.6	19.1	12.5
COSTS PER BUSHEL*		$.88	$.73	$1.23

*Bushel costs include a land charge, acre costs do not.

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Table 2. Cost of producing winter wheat on 22 farms, Douglas county, Nebraska, 1948.

Item	Your farm	Average of 22 farms	8 low-cost farms	8 high-cost farms
NUMBER OF FARMS		22	8	8
LABOR AND POWER PER ACRE: HOURS				
To harvest				
Man		2.45	1.94	2.79
Tractor		2.45	1.94	2.79
For harvest				
Man		1.15	1.08	1.09
Tractor		1.10	.94	1.09
Total				
Man		3.60	3.02	3.88
Tractor		3.55	2.88	3.88
COSTS PER ACRE				
Labor		$3.85	$3.50	$4.06
Power		$3.65	$3.32	$3.85
Equipment		$3.31	$3.42	$3.25
Other		$4.66	$3.90	$5.24
TOTAL COSTS PER ACRE*		$15.47	$14.14	$16.40
ACRES IN WHEAT		33.7	36.4	39.5
YIELDS PER ACRE: BUSHELS				
Average		28.0	32.3	23.1
Tenant's Share		16.2	19.0	13.2
COSTS PER BUSHEL*		$.95	$.74	$1.24

*Bushel costs include a land charge, acre costs do not.

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Table 3. Cost of producing winter wheat on 31 farms, Fillmore county, Nebraska, 1948.

Item	Your farm	Average of 31 farms	10 low-cost farms	10 high-cost farms
NUMBER OF FARMS		31	10	10
LABOR AND POWER PER ACRE: HOURS				
To harvest				
Man		1.67	1.60	1.65
Horse		.16	.20	.24
Tractor		1.61	1.52	1.57
For harvest				
Man		1.15	.90	1.59
Horse		.08	.07	.23
Tractor		.78	.56	1.02
Total				
Man		2.82	2.50	3.24
Horse		.24	.27	.47
Tractor		2.39	2.08	2.59
COSTS PER ACRE				
Labor		$2.73	$2.63	$2.86
Power		$2.55	$2.57	$2.58
Equipment		$2.87	$2.91	$2.82
Other		$4.21	$4.01	$4.35
TOTAL COSTS PER ACRE*		$12.36	$12.12	$12.61
ACRES IN WHEAT--SEEDED		127.7	171.1	114.5
ACRES IN WHEAT--HARVESTED		117.7	168.1	88.0
YIELDS PER ACRE: BUSHELS				
Average		19.8	23.0	14.7
Tenant's Share		13.2	15.4	9.7
COSTS PER BUSHEL*		$.99	$.80	$1.53

*Bushel costs include a land charge, acre costs do not.

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Table 4. Cost of producing winter wheat on 27 farms, Saunders county, Nebraska, 1948.

Item	Your farm	Average of 27 farms	9 low-cost farms	9 high-cost farms
NUMBER OF FARMS		27	9	9
LABOR AND POWER PER ACRE: HOURS				
To harvest				
Man		2.10	1.93	2.42
Horse		.37	--	1.14
Tractor		2.01	1.93	2.15
For harvest				
Man		1.29	1.33	1.40
Horse		.09	--	.37
Tractor		1.14	1.30	1.04
Total				
Man		3.39	3.26	3.82
Horse		.46	--	1.51
Tractor		3.15	3.23	3.19
COSTS PER ACRE				
Labor		$3.42	$3.38	$3.68
Power		$3.09	$3.00	$3.34
Equipment		$3.16	$3.22	$3.07
Other		$4.90	$4.54	$5.65
TOTAL COSTS PER ACRE*		$14.57	$14.14	$15.74
ACRES IN WHEAT SEEDED		35.8	45.8	26.1
ACRES IN WHEAT HARVESTED		34.6	44.3	24.4
YIELDS PER ACRE: BUSHELS				
Average		27.7	33.3	20.4
Tenant's Share		16.1	19.4	11.3
COSTS PER BUSHEL*		$.92	$.74	$1.45

*Bushel costs include a land charge, acre costs do not.

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Table 5. Cost of producing summer fallowed winter wheat on 17 farms, Cheyenne county, Nebraska, 1948.

Item	Your farm	Average of 17 farms	6 low-cost farms	6 high-cost farms
NUMBER OF FARMS		17	6	6
LABOR AND POWER PER ACRE: HOURS				
To Harvest				
Man		1.33	1.55	1.25
Tractor		1.33	1.55	1.25
For Harvest				
Man		1.00	1.50	.80
Tractor		.76	1.21	.62
Total				
Man		2.33	3.05	2.05
Tractor		2.09	2.76	1.87
COSTS PER ACRE				
Labor		$2.68	$3.28	$2.28
Power		$2.75	$3.33	$2.40
Equipment		$3.24	$3.61	$2.93
Other		$2.68	$2.31	$2.94
TOTAL COSTS PER ACRE*		$11.35	$12.53	$10.55
ACRES IN WHEAT--SEEDED		338.7	284.3	365.3
ACRES IN WHEAT--HARVESTED		320.1	284.3	312.7
YIELDS PER ACRE: BUSHELS				
Average		22.0	33.3	13.0
Tenant's Share		14.7	22.2	8.7
COSTS PER BUSHEL*		$.80	$.56	$1.33

*Bushel costs include a land charge, acre costs do not.

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Table 6. Cost of producing summer fallowed winter wheat on 18 farms, Perkins county, Nebraska, 1948.

Item	Your farm	Average of 18 farms	6 Low-cost farms	6 High-cost farms
NUMBER OF FARMS		18	6	6
LABOR AND POWER PER ACRE: HOURS				
To Harvest				
Man		1.24	1.04	1.75
Tractor		1.24	1.04	1.75
For Harvest				
Man		.83	.79	.98
Tractor		.61	.42	.74
Total				
Man		2.07	1.83	2.73
Tractor		1.85	1.46	2.49
COSTS PER ACRE				
Labor		$2.81	$2.69	$3.09
Power		$2.90	$2.71	$3.39
Equipment		$3.49	$3.57	$3.39
Other		$2.45	$2.12	$3.13
TOTAL COSTS PER ACRE*		$11.65	$11.09	$13.00
ACRES IN WHEAT--SEEDED		267.1	392.5	140.3
ACRES IN WHEAT--HARVESTED		267.1	392.5	140.3
YIELD PER ACRE: BUSHELS				
Average		29.6	32.0	24.0
Tenant's Share		19.8	21.3	16.0
COSTS PER BUSHEL*		$.59	$.52	$.81

*Bushel costs include a land charge, acre costs do not.

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Scale of Charges

All cash outlays as given by cooperating farmers were used in determining these winter wheat costs. Other items such as unpaid labor, power costs and machinery costs were charged at going rates for the community or at rates based on a study made by the Nebraska Experiment Station in 1947. Some of the more important charges used were as follows:

1. Man labor per hour	70¢
2. Power per hour	
Horse	20¢
Tractor[2]	
6 to 10.9 drawbar horsepower	71¢
11 to 20.9 drawbar horsepower	80¢
21 to 25.9 drawbar horsepower	$1.02
26 to 30.9 drawbar horsepower	$1.16
3. Equipment costs per acre[3]	
Disk, single	10¢
Disk, tandem	16¢
Disk, one-way	13¢
Plow, gang	28¢
Harrow, spike tooth	4¢
Harrow, spring tooth	4¢
Drill, Grain	25¢
Tiller or duckfoot	16¢
Roller	28¢
Rod weeder	5¢
Binder	
7 foot, horse	65¢
9 foot, tractor (one man)	97¢
10 foot, tractor (two men)	66¢
Sprayer or duster	25¢
Float, 9 foot, per hour	21¢
Wagon, rack and harness (threshing)	4¢ per horse hour used

4. Preliminary Preparation. This item is included under "costs per acre", as "Other" in the tables. It is arbitrarily figured as 20 per cent of the total costs for labor, power and equipment for each operation up to harvest. Under harvest costs, it is included for binding but not for combining and hauling since these costs were charged at going custom rates. Preliminary preparation costs are intended to cover such costs as moving to and from fields, getting machines in readiness for operation and any other costs pertaining to machinery that may not otherwise be included.

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[2]Based on Bulletin 324, Revised. Cost of Tractor Power on Nebraska Farms. Nebraska Agricultural Experiment Station. Charges increased on basis of current increase in costs.

[3]Unpublished data. Nebraska Agricultural Experiment Station.

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5. Combining was charged at going custom rates per acre in the different counties as follows:

Cass	$5.00	Saunders	$5.00
Douglas	5.00	Cheyenne	4.00
Fillmore	4.00	Perkins	4.50

Combining charges were apportioned as follows:

	Combines less than 10 foot	Combines 10 foot or more
Labor	34%	29%
Power	20%	19%
Equipment	46%	52%

6. Hauling from combine or thresher to market: These charges were made at flat rates per bushel based on farmer opinion.

Cass	3¢	Saunders	2 1/2¢
Douglas	4¢	Cheyenne	5¢
Fillmore	3¢	Perkins	5¢

Hauling charges were apportioned as follows:

Labor	42%
Power	42%
Equipment	16%

7. Tractor hours for harvest in most cases also includes truck hours for hauling, so that this item is not exclusively a tractor item but is more specifically a power item. The cost for this item was determined by taking a percentage of the hauling cost, irrespective of whether trucks or tractors were used for hauling.