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ESTIMATED PER ACRE COST AND RETURNS WINTER WHEAT COLUMBIA BASIN WASHINGTON

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WINTER WHEAT
ESTIMATED PER ACRE COSTS AND RETURNS
COLUMBIA BASIN, WASHINGTON

by
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INTRODUCTION

Wheat is one of the leading crops in the Columbia Basin. It ranked as one of the top five crops in total value between 1960 and 1967. The acreage of wheat more than doubled between 1963 and 1967, as shown below.

Irrigated Wheat Production in the Columbia Basin

<u>Year</u>	<u>Acres in Irrig. Wheat</u>	<u>Ave. Yield per Acre</u>	<u>Ave. Price per Bushel</u>	<u>Ave. Value per Acre</u>
1963	45,561	79	\$ 1.78	\$ 104.62
1964	66,435	83	1.32	109.56
1965	60,016	83	1.34	111.22
1966	64,912	90	1.58	142.20
1967	105,054	74	1.42	105.08

Data from U. S. Bureau of Reclamation annual crop reports; does not include value of federal support and certificate payments.

Winter wheat is the most common wheat in the Basin. Gaines and Nugaines are the usual winter wheat varieties.

The popularity of winter wheat is due to its relative profitability and its suitability to the soil and climatic conditions in the area. Also, wheat production requires less water, labor and management than many other adapted crops.

The seeding dates for winter wheat commonly range from September to January. February plantings have also produced good yields, but generally not as high as earlier seedings. Early plantings are effective in reducing wind erosion during the windy spring months.

Wheat is an excellent crop for rotation purposes. The crop residue increases water penetration and reduces wind and water erosion. However, continuous cropping of wheat can result in reduced wheat yields. Take-All, a fungus disease, can become a serious problem when wheat follows wheat on irrigated land.

Columbia Basin farmers usually received only the cash market price for their wheat crop. Few Basin farmers had sufficient wheat history to qualify for price support loans or wheat marketing certificates.

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OBJECTIVE OF THIS STUDY

This study was conducted to provide cost and return information for farmers growing winter wheat and those considering winter wheat production. Representatives of credit organizations that finance winter wheat production will also find it useful. Further, the information provides a basis for comparing winter wheat costs and returns with those for other adapted crops.

Data in the tables indicate expected income and expenses when 50 acres of Columbia Basin land on a 200-acre surface irrigated farm are used to grow winter wheat.

METHOD OF OBTAINING DATA

The data were obtained from a selected group of growers producing wheat in the Columbia Basin. The data were reviewed by growers, county agents, and others familiar with wheat production in the area.

The costs and returns shown in the tables are not averages, but represent expected costs and returns under the conditions assumed for this study. Therefore, growers should use the information only as a basic guide until more data are available from their own records. Space was provided in each table so operators can insert their own data as they become available.

TABLE 1. COSTS AND RETURNS SUMMARY

Returns: Returns from wheat production depend on (1) the yield per acre, (2) the market price of wheat at the time of sale, and (3) government payments to the growers.

Government payments vary from farm to farm according to the wheat acreage allotment for the farm and the established normal yield per acre. They also vary from year to year according to adjustments in the national allotted acres and the support price.

The five-year, 1963-1967, average wheat yield for the Columbia Basin was 82 bushels per acre. However, yields ranged from about 50 to 140 bushels per acre.

For this study, returns were based on a 100-bushel yield per acre and a market price of \$1.30 per bushel, as shown in Table 1. This amount does not include a government support payment.

Expenses: Crop expenses were computed by determining usual production and harvest practices and the associated costs for labor, materials, and machinery. Cash and non-cash overhead costs were then added to the production and harvest cost to determine total costs per acre.

Fall operations for winter wheat normally included pre-irrigation, fertilizing, preparing the seedbed, planting the seed, and corrugating the field after planting.

Nitrogen was the principal fertilizer applied. The amount of nitrogen applied in the fall depended mainly on texture of the surface soil, time of planting, and the preceeding crop. Fall applications ranged from none to over 200 pounds available nitrogen per acre. This study assumed a fall application of 175 pounds available nitrogen per acre.

Usual spring pre-harvest operations included fertilizing, irrigation, and pest control. Spring applications of nitrogen depended on soil conditions and the amount applied in the fall. This study assumed a spring application of 50 pounds available nitrogen per acre.

A charge of \$3.00 per acre was made for weed control materials and custom application. Four irrigations were assumed, at a cost of \$2.62 per acre.

The cost of combing and hauling the wheat to a receiving station was based on custom rates. Operators who own a combine and harvest their own crop should adjust their costs accordingly. Adjustments are also needed for those who haul their own wheat and for those who store it on the farm.

Cash Overhead: Cash overhead included real estate and personal property TAXES, irrigation WATER assessments, GENERAL OVERHEAD, and INTEREST ON OPERATING CAPITAL. No charge was made for RENT since a charge was made for land taxes and interest on the investment in land. Those who rent land should adjust their cost accordingly.

A charge of five percent of cash costs was included as general overhead, to cover such unitemized expenses as utilities, insurance, travel, office costs, etc.

The financial situation of the operator will determine whether INTEREST ON OPERATING CAPITAL is a cash or non-cash cost. It is a cash cost when the operator borrows the money; a non-cash opportunity cost when he uses his own money for operating expenses.

Non-Cash Costs: The non-cash charges were for OPERATOR'S LABOR and the amount due to INVESTMENT OVERHEAD.

Investment overhead consisted of DEPRECIATION of equipment and buildings and INTEREST ON AVERAGE INVESTMENT in equipment, buildings, and land. Details of the investment overhead charges are shown in Table 2.

Return for Operator's Labor and Management: The non-cash charge for OPERATOR'S LABOR (\$6.15 per acre) was included in TOTAL COSTS. Therefore, that amount was deducted from total costs when determining the operator's labor and management income per acre.

TABLE 2. CAPITAL INVESTMENT

Table 2 lists the equipment and buildings necessary for wheat production. It was assumed that most items were used for other enterprises on the farm, so only a portion of their annual depreciation and interest on investment was charged to the wheat enterprise.

Also shown are expected cash costs per hour of operation for the various items of equipment.

TABLE 3. MONTHLY CASH FLOW

The cash expense and income, taken from Table 1, are shown by operation and expected month of occurrence. Table 3 was prepared for farmers who want to budget their financial and labor needs for each month.

The income from wheat is shown as being received in September. However, an individual's income may be on a different time basis. Each operator can indicate expected income according to his usual harvest, storage, and selling practices.

TABLE 4. COSTS PER ACRE AND PER BUSHEL AT SELECTED YIELDS

Table 4 shows the cash, non-cash and total costs on a per acre and per bushel basis for wheat yields ranging from 70 bushels to 120 bushels per acre.

The growers indicated the principal factors that determine their wheat yields are time and rate of seeding, time and rate of fertilizer application, irrigation and pest control practices, and care in harvesting. They indicated that most pre-harvest costs do not change with yields. Custom harvest costs, however, will vary with the yield.

Again, the non-cash and total costs include a charge for operator's labor.

Based on the assumptions used for this study, the cost of producing a bushel of wheat ranged from \$1.90 per bushel at the 70-bushel yield level to \$1.15 per bushel for 120-bushel yields.

TABLE 5. OPERATOR'S RETURN AT SELECTED YIELDS AND PRICES

Table 5 shows the labor and management income per acre that a grower can expect at certain yields and prices. Yields were varied from 70 to 120 bushels per acre. Prices were varied from \$1.25 to \$1.75 per bushel.

The study indicated that growers need to carefully consider the advisability of producing irrigated wheat that is not eligible for government payments unless their average yield approaches 100 bushels per acre. The amount of government payments has considerable influence on the farm income and profit when wheat is produced in the Columbia Basin.

TABLE 1. ESTIMATED COSTS AND RETURNS PER ACRE
COLUMBIA BASIN, WASHINGTON
(1967)

	Hours per Acre	Labor ^{1/}	Machinery Fuel and Repairs	Materials & Other	Total	Your Estimate
		\$	\$	\$	\$	\$
RETURNS						
100 bushels @ \$1.30 per bu. Wheat Certificates					130.00	
COSTS						
Preplant						
Corrugate	.25	.44	.42		.86	
Pre-irrigate	.50	.87			.87	
Fertilizer (175# N @ 12c) ^{2/}				21.00 [‡]	21.00	
Custom apply				1.50 [‡]	1.50	
Disc	.33	.58	.63		1.21	
Plant to Harvest						
Planting	.33	.58	.63		1.21	
60 lbs. seed ^{3/}				3.50	3.50	
Corrugate	.25	.44	.42		.86	
Ditch cleanup, repair (spring)	.10	.18	.16	.75 [‡]	1.09	
Fertilizer - spring applied (50# nitrogen @ 12c)	.25	.44	.44	6.00 [‡]	.88	
Weed control				.50 [‡]	.50	
Custom apply				2.50 [‡]	2.50	
Irrigate, 4x	1.5	2.62			2.62	
Insect control						
Harvest						
Combine (custom) ^{4/}				12.00 [‡]	12.00	
Hauling (5 miles) ^{5/}				4.50 [‡]	4.50	
Cash Overhead^{6/}						
Taxes				8.00	8.00	
Rent						
Water				10.00	10.00	
General Overhead (5% of cash costs)				4.00	4.00	
Int. on Oper. Capital (9 mo. @ 7%)				4.00	4.00	
TOTAL CASH COSTS PER ACRE			2.70	78.25	80.95	
Operator's Labor		6.15			6.15	
Investment Overhead^{7/}						
Depreciation				7.84	7.84	
Int. on Average Investment				39.50	39.50	
TOTAL NON-CASH COSTS PER ACRE		6.15		47.34	53.49	
TOTAL COSTS PER ACRE		6.15	2.70	125.59	134.44	
NET RETURNS FOR OPERATOR'S LABOR & MANAGEMENT					1.71	

Costs based on 50 acres of wheat on a 200-acre surface irrigated farm.

‡These operations usually hired.

^{1/}Labor charged at \$1.75 per hour.

^{2/}Consult your county agent or fieldman for local recommendations on specific cultural practices.

^{3/}Seeding rate varies according to seeding date.

^{4/}Custom combine rate: \$12 per acre plus 12-1/2c per bushel over 100 bushels.

^{5/}Custom hauling rate: \$1.40 per ton for 3 miles plus 5c for each additional ton mile.

^{6/}Rounded to the nearest dollar.

^{7/}See Table 2 for details on investment overhead costs.

TABLE 2. CAPITAL INVESTMENT^{1/}

	Purchase Price	Salvage Value	Average Value	Percent Due to Wheat	Method of Deprec. ^{2/}	Annual Costs		Annual Costs (Your Estimate)		Cash Costs Per Hour		
						Deprec.	Int. 7%	Deprec.	Int. (%)	Fuel	Repairs	Total
Tractor, 60 HP, diesel	\$ 7,500	\$ 1,500	\$ 4,500	20	10 SL	\$ 120.00	\$ 63.00	\$	\$	\$.52	\$.98	\$ 1.50
Disc, tandem, 12'	1,200	200	700	25	8 SL	31.25	12.25				.40	.40
Drill, grain, 12'	1,250	350	800	50	10 SL	45.00	28.00				.40	.40
Cultivating equip.	400	100	250	20	8 SL	7.50	3.50				.20	.20
Fertilizer spdr., 12'	400	0	200	50	6 SL	33.33	7.00				.25	.25
Irrigation equip.	100	0	50	100	10 SL	10.00	3.50					
Pickup	2,500	700	1,600	20	6 SL	60.00	22.40			.02 [‡]	.03 [‡]	.05 [‡]
Shed and Shop	3,500	0	1,750	25	25 SL	35.00	30.62					
Shop equipment	2,000	0	1,000	25	10 SL	50.00	17.50					
Land, 50 acres @ \$550			27,500									
TOTAL						392.08	1,975.27					
YOUR TOTAL												
PER ACRE						7.84	39.50					
YOUR COST												

[‡] Expected cost per mile of operation.

^{1/} Based on 50 acres of wheat on 200-acre surface irrigated farm.

^{2/} Straight line (SL) method of depreciation used; the number (10) indicates year of expected use.

^{3/} Interest on land investment charged at 6.5 percent.

TABLE 3. MONTHLY CASH FLOW

OPERATION	TOTAL	S	O	N	D	J ^{1/}	F	M	A	M	J-J	A	S
<u>Pre Plant</u>	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Corrugate	.42	.30				.12							
Pre-irrigate													
Fertilizer - apply	1.50	1.50											
- material	21.00	21.00											
Disc	.63		.43			.20							
<u>Plant to Harvest</u>													
Planting	.63		.40			.23							
Seed	3.50		3.50										
Corrugate	.42		.31			.11							
Ditch repair, cleanup	.91							.91					
Fertilizer - apply	.44					.14		.30					
- material	6.00							6.00					
Irrigation													
Weed control													
- apply	.50								.50				
- material	2.50								2.50				
Insect control													
<u>Harvest</u>													
Combine	12.00											12.00	
Hauling	4.50											4.50	
<u>Cash Overhead</u>													
Taxes	8.00								8.00				
Rent													
Water	10.00								10.00				
General Overhead	4.00	1.00	.50			.50		.50	.50			1.00	
Int. on Oper. Cap.	4.00												4.00
TOTAL CASH COSTS	80.95	23.80	5.14			1.30		7.71	21.50			17.50	4.00
YOUR CASH COSTS													
INCOME	130.00												130.00
YOUR INCOME													
NET CASH	49.05	-23.80	-28.94	-28.94	-28.94	-30.24	-30.24	-37.95	-59.45	-59.45	-59.45	-76.95	49.05
YOUR NET CASH													

1/ These costs are due to normal winter repairs and replacements of worn parts.

TABLE 4. COST PER ACRE AND PER BUSHEL
AT SELECTED YIELDS

	Yield, bushels per Acre						Your Estimate
	70	80	90	100	110	120	
Pre-Plant	\$ 23.55	\$ 23.55	\$ 23.55	\$ 23.55	\$ 23.55	\$ 23.55	\$
Plant to Harvest	14.90	14.90	14.90	14.90	14.90	14.90	
Harvest Costs ^{1/}							
- combine	12.00	12.00	12.00	12.00	13.25	14.50	
- hauling	3.14	3.60	4.05	4.50	4.95	5.40	
Cash Overhead	26.00	26.00	26.00	26.00	26.00	26.00	
TOTAL CASH COSTS PER ACRE	79.59	80.05	80.50	80.95	82.65	84.35	
TOTAL CASH COSTS PER BUSHEL	1.14	1.00	.89	.81	.75	.70	
Operator's Labor	6.15	6.15	6.15	6.15	6.15	6.15	
Depreciation on bldgs., equipment	7.84	7.84	7.84	7.84	7.84	7.84	
Interest on Investment	39.50	39.50	39.50	39.50	39.50	39.50	
NON-CASH COSTS PER ACRE ^{2/}	53.49	53.49	53.49	53.49	53.49	53.49	
NON-CASH COSTS PER BUSHEL	.76	.67	.59	.53	.49	.45	
TOTAL COSTS PER ACRE ^{2/}	133.08	133.54	133.99	134.44	136.14	137.84	
TOTAL COSTS PER BUSHEL	1.90	1.67	1.49	1.34	1.24	1.15	

^{1/}Custom harvest and hauling rates shown in Table 1 footnotes.^{2/}Includes non-cash cost of operator's labor.TABLE 5. OPERATOR'S LABOR & MANAGEMENT RETURN PER ACRE
AT SELECTED YIELDS AND PRICES

Price per Bushel	Yield, bushels per acre						Your Estimate
	70	80	90	100	110	120	
\$ 1.25	\$ -39.43	\$ -27.93	\$ -15.34	\$ -3.29	\$ 7.51	\$ 18.31	\$
1.30	-35.93	-23.93	-10.84	1.71	13.01	24.31	
1.35	-32.43	-19.93	-6.34	6.71	18.51	30.31	
1.40	-28.93	-15.93	-1.84	11.71	24.01	36.31	
1.45	-25.43	-11.93	2.66	16.71	29.51	42.31	
1.50	-21.93	-7.93	7.16	21.71	35.01	48.31	
1.55	-18.43	-3.93	11.66	26.71	40.51	54.31	
1.60	-14.93	.07	16.16	31.71	46.01	60.31	
1.65	-11.43	4.07	20.66	36.71	51.51	66.31	
1.70	-7.93	8.07	25.16	41.71	57.01	72.31	
1.75	-4.43	12.07	29.66	46.71	62.51	78.31	