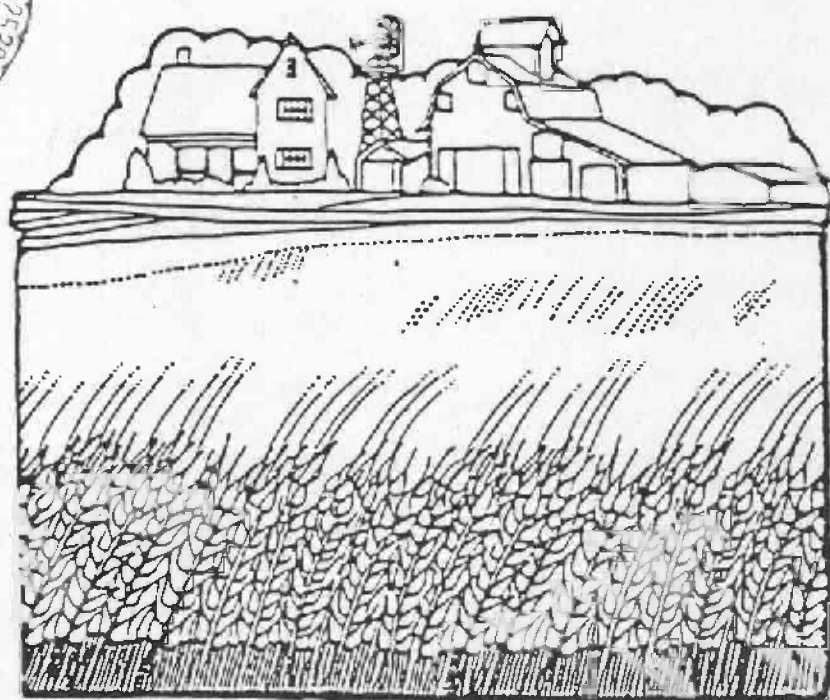




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# ryland Wheat Production and Marketing Costs in Oregon's Columbia Plateau, 1989-1990



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OREGON STATE UNIVERSITY EXTENSION SERVICE

# DRYLAND WHEAT PRODUCTION AND MARKETING COSTS IN OREGON'S COLUMBIA PLATEAU, 1989-90

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Oregon growers produced 52.6 million bushels of wheat in 1989 with an estimated farm value of about \$212.70 million, making wheat among the highest valued farm crops in the state. Wheat production is a particularly important agricultural enterprise in Oregon's Columbia Plateau. In 1989, five counties in the Columbia Plateau accounted for \$126.7 million of wheat sales from 652,000 harvested acres.<sup>2</sup>

The purpose of this study is to present estimated costs of producing and marketing wheat in the Columbia Plateau counties of Gilliam, Morrow, Sherman, Umatilla, and Wasco. Cost information for a summer fallow - winter wheat rotation is detailed for a mold-board plow tillage system. Growers, agricultural lenders, and others concerned with the wheat industry will find this information useful in estimating the physical and financial requirements of producing dryland wheat in the area.

## Sources of Information

Wheat growers provided the basic information regarding the size of the study farm; production practices followed; machinery, labor, and material requirements; land rental values; and overhead expenses. Additional information was obtained from local suppliers, machinery dealers, and lenders. The data were then summarized and reviewed by wheat growers, county agents, and others familiar with dryland wheat production in the study area.

Given these procedures, the figures reported in this study should be viewed as "typical" or "representative" rather than averages. Because soil types, rainfall, farm size, machinery use, and cultural practices followed vary from farm to farm and greatly influence costs of production,

growers are encouraged to estimate costs for their own operations.

## Study Assumptions

The following assumptions underlie the costs reported in this study. These assumptions should be carefully reviewed and evaluated when interpreting the costs presented in this study.

1. The owner-operator-manager of the study farm has 2,500 acres of cropland with 1,250 acres in winter wheat and 1,250 acres in fallow each year.
2. Long-term average wheat yield is 42 bushels per acre.
3. Production inputs such as fertilizer, seed, and chemicals are charged at October 1989 prices.
4. Machinery values are based on October 1989 replacement costs. (See appendix tables for detailed machinery costs.) Machinery costs are calculated assuming the equipment is half depreciated. Depreciation is charged to provide an indication of earnings needed to replace depreciable assets. When an

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<sup>1</sup> The authors are, respectively, Wasco County Extension Agent, Sherman County Extension Agent, District Farm Management Agent, Hood River/Wasco/ Sherman/Gilliam Counties, and Extension Agricultural Economist. The assistance of wheat growers, county agents, and others who helped develop these data is gratefully acknowledged.

<sup>2</sup> Source: Extension Economic Information Office, Oregon State University, 1989 preliminary figures.

enterprise is being evaluated to determine its long-run viability, it is important to consider the ability of the enterprise to replace depreciable assets on a new cost basis. Interest costs reflect the cost of investing in machinery and equipment.

5. The operator's labor (\$9/hr.) and managerial input (\$5.80/ac.) is treated as an opportunity cost—that is, the operator has an alternative use for these inputs that could earn the budgeted amount.
6. Marketing costs include put-through charges at the elevator, storage for an average of six months, transportation to Portland, and the Oregon Wheat Commission assessment. Thus, the total cost estimates are on a "delivered to Portland" basis.
7. A charge for land is included and is based on farm use value market rental rates. There are a number of ways of determining a charge for land—share rent, cash rent, and current market value, for example. Arguments have arisen over which method, if any, should be used. It is not our intent to resolve this problem. But since land is a resource used in the production of wheat (just like labor, seed, and fertilizer), some charge should be made.
8. No participation in USDA wheat and feed grain programs is assumed.

### **Production Costs**

The approach taken in developing cost estimates was to identify a schedule of field operations (table 1). Next, the labor required, machines used, and materials applied were estimated. Costs identified for each operation include (a) labor, (b)

machinery operation, (c) machinery ownership, and (d) materials. The number of times-over for each operation (e.g., 1.5X) is indicated if it is other than one. The total estimated production cost for the 1989-90 crop is \$190.01 per planted acre for a mold-board plow tillage system (table 1).

Table 2 provides a summary of these costs and space for growers to enter their own costs. With a long-term average yield of 42 bushels per acre, the total cost of producing, hauling to storage, and marketing the grain in Portland is \$4.55 per bushel. Cash costs are \$1.40 per bushel (cash cost for land expense omitted). Notice that these budgets include costs for 2 acres—one acre of summer fallow and one acre of winter wheat. Machinery costs and assumptions are given in detail in the appendix tables.

In addition to the cash costs of producing wheat, it is also important to recognize that cash is required to replace machinery, meet mortgage payments, pay income taxes, and provide for family living expenses. Each year the wheat farm business must generate sufficient cash receipts to meet these cash requirements. Besides meeting these cash costs each year, over a number of years the business must generate sufficient income to cover other noncash costs indicated in table 2. Cash requirements will vary with leasing arrangements, mortgage and debt levels, and family living needs. Here again, growers should determine their own cash requirements.

Wheat yields in the Columbia Plateau may be affected by adverse or beneficial growing conditions. The bottom section of table 2 compares the total wheat production cost per bushel at the assumed yield of 42 bushels per acre with yields above and below the long term average. These costs assume that the costs of cultural operations are held constant, while harvesting and marketing costs vary according to yield. Thus, an illustration of the sensitivity of wheat production costs to changes

in yields caused by varying growing conditions is provided.

Appendix tables A-1 through A-3 show the complement of machinery used on the representative study farm and the method used for calculating the ownership and operating costs for each piece of machinery.

### **Increase in Yields**

This annual cost study began in 1973, using an average yield of 32 bushels per acre. Since 1980, however, a yield figure of 34 bushels per acre has been assumed.

But little remains static even in dryland agricultural situations. Average yields in the Columbia Plateau have increased since the inception of this report.

The yield increase is due to many factors, including the development and introduction of new higher yielding wheat varieties and national farm programs such as the Conservation Reserve Program, which allows producers to retire or set aside marginal wheat acres.

Yields have also increased as research and technology have contributed to improved management practices, higher equipment efficiencies, new weed control options and increased understanding of cultural practices and their relation to plant growth and erosion control.

In recognition of these factors, this year's report adjusts the assumed study

yield to 42 bushels per acre, with appropriate adjustments to seed, fertilizer, trucking and marketing expenses.

Forty two bushels per acre is a 15 year average of the wheat production in Wasco, Sherman, Gilliam and Morrow Counties. The moving 15 year average for dryland wheat yields will be used as the assumed yield in future studies.

### **Concluding Note**

The cost estimates presented in this report are based on a number of assumptions. The situation described is not characteristic of all farm operations. It is essential to use the figures reported primarily as a guide. The "Your Cost" column of table 2 should be used to calculate your own estimated cost of production. Considerable judgment should be exercised in generalizing costs to situations differing from those identified above.

### **Acknowledgement**

The authors would like to extend their sincerest thanks to the producers, agribusinesses, Extension agents and specialists, and the Oregon Wheat Growers, for their input and continued support for this study. Without their assistance, this report would not be possible.

Table 1. Estimated Inputs and Costs Per Planted Acre (including fallow costs) for Dryland Wheat, Oregon Columbia Plateau

	Labor		Machinery costs <sup>(a)</sup>		Other		Total Cost
	Hours	Value (\$)	Operating (\$)	Ownership (\$)	Item	Cost (\$)	
Cultural operations							
Mold-board plow, 10-16"	0.18	1.64	2.11	5.75			9.50
Cultivator, 40' (1.5X)	0.11	1.00	1.37	3.76			6.14
Rod weed, 48' (3X)	0.20	1.80	2.83	5.71			10.35
Fertilize <sup>(b)</sup>	0.07	0.60	0.61	1.32	45 # N	8.55	11.08
Drill seed, 4-8' (1.1X)	0.08	0.76	1.16	4.37	60 # seed	6.90	13.20
Haul seed <sup>(c)</sup>	0.01	0.07	0.10	0.23			0.43
Spray herbicide <sup>(d)</sup>					chemicals custom	7.00	
						3.50	10.50
Harvest operations							
Combine, 20' hillside	0.14	1.29	3.79	15.09			20.16
Haul grain <sup>(e)</sup>	0.14	0.89	2.20	4.86			7.95
Other charges							
Other labor <sup>(f)</sup>	0.50	3.81					3.81
Pickup truck <sup>(c)</sup>	1.60	3.12					4.72
Other machinery			1.03	3.95			4.98
Conservation practices						0.30	0.30
Crop insurance <sup>(g)</sup>						3.12	3.12
Marketing <sup>(h)</sup>						20.58	20.58
Operating capital int (%)						3.69	3.69
Miscellaneous <sup>(i)</sup>						5.00	5.00
Land charge <sup>(j)</sup>						50.00	50.00
Management						5.80	5.80
TOTAL COST PER PLANTED ACRE		11.89	16.80	48.17		114.44	191.30

(a) Machinery operating costs include repairs (parts and labor), maintenance, oil and lubrication. Machinery ownership costs include depreciation, interest on average investment @ 13.50%, and insurance.

(b) Fertilizer cost includes use of the applicator.

(c) Based on the following mileage: 350 miles on trucks hauling seed, 7,450 miles on trucks hauling grain and 10,000 miles on pickup.

(d) Where morning glory control is necessary, add \$7.10 for herbicide plus \$2.50 for application.

(e) Hired labor cost (wages and benefits) for hauling grain is based on 175 hours per year @ \$6.25 per hour.

(f) Other labor includes such items as moving and servicing machinery, checking fields, etc. Half of this is hired @ \$6.25 per hour.

(g) Crop insurance includes hail and fire at \$0.86 and Multi-Peril crop insurance at \$2.26 per acre.

(h) Marketing costs include elevator put-through @ \$0.11/bu., storage for an average of 6 months @ \$0.12/bu., transportation to Portland @ \$0.24/bu., and Wheat Commission assessment @ \$0.02/bu.

(i) Miscellaneous expenses include general insurance, tools, shop, utilities, accounting fees, office supplies, etc.

(j) Land charge is based on farm use value and market rental rates.

Table 2. Dryland Wheat Production Costs Per Planted Acre (including fallow costs) Oregon Columbia Plateau

Expense category	Unit cost	Study costs —\$ per planted acre—	Your cost
Cash operating costs			
Fertilizer	0.19 \$/lb	8.55	_____
Wheat seed	0.115 \$/lb	6.90	_____
Herbicide and application		10.50	_____
Diesel fuel	0.8 \$/gal	4.18	_____
Gasoline	1.04 \$/gal	2.13	_____
Lubricants		1.11	_____
Machinery repair		9.38	_____
Crop insurance		3.12	_____
Conservation practices		0.30	_____
Hired labor	6.25 \$/hr	2.46	_____
Miscellaneous		5.00	_____
Operating capital interest	12.5%	3.69	_____
Subtotal		57.31	_____
Cash ownership costs			
Machinery insurance and fees		1.58	_____
Subtotal		1.58	_____
Other ownership costs			
Land charge		50.00	_____
Interest on machinery	13.5%	27.22	_____
Machinery depreciation		19.38	_____
Subtotal		96.59	_____
Operator labor and management			
Operator labor	9 \$/hr	9.41	_____
Management		5.80	_____
Subtotal		15.21	_____
Marketing 42 bu/ac @	0.49 per bu	20.58	_____
TOTAL COST PER ACRE		191.27	_____
Total cost per bushel at	42 bu/ac	4.55	_____
Total cost per bushel at	30 bu/ac	6.12	_____
Total cost per bushel at	40 bu/ac	4.75	_____
Total cost per bushel at	60 bu/ac	3.38	_____

Table A-1. Machinery Assumptions for the 2,500 Acre Dryland Wheat Farm, Oregon Columbia Plateau

Machine	Current value <sup>(a)</sup> (\$)	Salvage value (\$)	Remaining life <sup>(b)</sup> (\$)	Annual use (yrs)	Fuel consumption
Crawler tractor, 90 DBHP	68750	22500	7.5	806 hrs	7 gal/hr
Mold-board plow, 10-16"	13000	6000	7.5	227 hrs	--
Cultivator, 40'	9132	3763	7.5	139 hrs	--
Rod weeder, 48'	9400	4800	5	250 hrs	--
Grain drills, 4-8' <sup>(c)</sup>	15500	6000	7.5	106 hrs	--
Combine, 20' hillside	80000	35000	6	179 hrs	5 gal/hr
Trucks, 2-ton <sup>(d)</sup>	25000	12500	5	7800 mi	5 mi/gal
Pickup, 3/4 ton, 4 X 4	11750	6000	3	10000 mi	10 mi/gal
Other machinery <sup>(e)</sup>	19500	8000	5	1250 ac	--

(a) Calculated by adding the estimated purchase cost to the value and dividing the sum by two.

(b) Assumes machine is at one-half its useful life.

(c) There are two sets of drills, one deep furrow and one older disc type.

(d) There are two 2-ton trucks, one relatively new and one older.

(e) Includes items such as: trap wagon, disc, rotary hoe and harrow.

Table A-2. Machinery Ownership Costs for the 2,500 Acre Dryland Wheat Farm, Oregon Columbia Plateau

Machine	Depreciation <sup>(a)</sup> (\$/yr)	Interest <sup>(b)</sup> 13.5% (\$/yr)	Insurance (\$/yr)	Total annual ownership costs (\$/yr)
Crawler tractor, 90 DBHP	6167	9281	518	15965
Mold-board plow, 10-16"	933	1755	---	2688
Cultivator, 40'	716	1233	---	1949
Rod weeder, 48'	920	1269	---	2189
Grain drills, 4-8'	1267	2093	---	3359
Combine, 20' hillside	7500	10800	563	18863
Trucks, 2-ton	2500	3375	490 <sup>(c)</sup>	6365
Pickup, 3/4 ton, 4 X 4	1917	1586	400 <sup>(c)</sup>	3903
Other machinery	2300	2633	---	4933
<b>TOTAL</b>	<b>24219</b>	<b>34024</b>	<b>1970</b>	<b>60213</b>

(a) Calculated by subtracting the salvage value from the current value and dividing the difference by the remaining life of the machine (see table A-1).

(b) Calculated as interest on the current value from table A-1.

(c) Also includes appropriate license fees.



Table A-3. Machinery Operating Costs for the 2,500 Acre Dryland Wheat Farm, Oregon Columbia Plateau

Machine	Repairs <sup>(a)</sup> (\$/yr)	Fuel <sup>(b)</sup> (\$/yr)	Lube (\$/yr)	Total annual operating costs (\$/yr)	Total annual costs <sup>(c)</sup> (\$/yr)
Crawler tractor, 90 DBHP	2040	4511	781	7333	23298
Mold-board plow, 10-16"	564	----	----	564	3253
Cultivator, 40'	452	----	----	452	2400
Rod weeder, 48'	1266	----	----	1266	3455
Grain drills, 4-8'	491	----	----	491	3850
Combine, 20' hillside	3844	714	173	4732	23594
Trucks, 2-ton	1017	1622	234	2874	9239
Pickup, 3/4 ton, 4 X 4	761	1040	200	2001	5904
Other machinery	1291	----	----	1291	6223
TOTAL	11726	7888	1389	21002	81216

(a) Includes costs for parts and labor, both paid and unpaid.

(b) Based on: 0.80 per gallon for diesel fuel and  
1.04 per gallon for gas.

(c) Calculated by adding total annual ownership costs presented in table A-2 and the total annual operating cost presented here.

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