


Farm Business Management Reports		EB1712
	<p>1992 Crop Enterprise Budgets for Spring Barley and Summer Fallow-Winter Wheat in the 13-15 Inch Rainfall Region of Asotin County, Washington</p>	
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Note

Enterprise costs and returns vary from one farm to the next and over time for any particular farm. Variability stems from differences in the following:

- Capital, labor, and management resources.
- Type and size of machinery complement.
- Cultural practices.
- Size of farm enterprise.
- Crop yields.
- Input prices.
- Commodity prices.

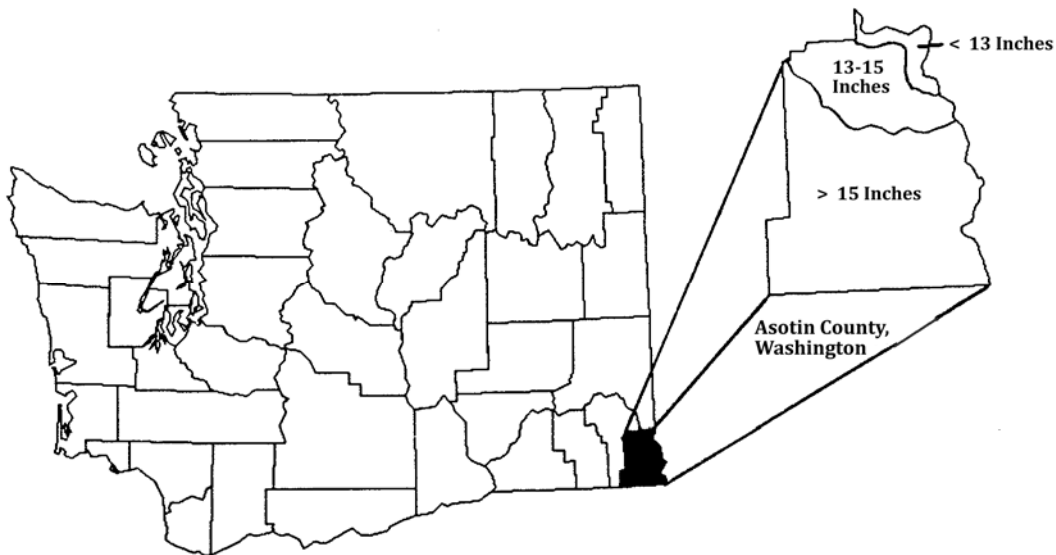
Costs can also be calculated differently depending on the intended use of the cost estimate. The information in this publication serves as a general guide for a modern, well-managed grain farm in Asotin County. To avoid drawing unwarranted conclusions about any particular farm or group of farms, the reader must closely examine the assumptions used. If they are not appropriate for the situation at hand, adjustments in the costs and/or returns should be made.

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Herbert R. Hinman, Gary D. Delaney, and Baird C. Miller*

INTRODUCTION

This publication presents projected costs and returns for spring barley and summer fallow-winter wheat which is commonly grown in the 13- to 15-inch rainfall area of Asotin County. Two common crop rotations are used in this area; spring barley-summer fallow-winter wheat, and spring barley-spring barley-summer fallow-winter wheat. A second spring barley crop is included in the rotation when available spring soil moisture is adequate for a good yielding crop. This strategy is sometimes used on shallow soils when winter precipitation fills the soil profile. The relative profitability of both these rotations are examined in this publication. Producers, agricultural lenders, and others should find this information helpful to identify enterprise strengths and weaknesses, plan production adjustments, determine financial requirements, make marketing decisions, and resolve other business management problems.



The budgets do not represent a particular farm. Instead, they represent costs and returns under the specific assumptions adopted for the study. We recommend that individual growers use the blanks provided on the right-hand side of various budgets to estimate their own costs and returns. Consult local Cooperative Extension agents and fieldpersons for recommendations on field operations and operating inputs.

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SOURCES OF INFORMATION

The county extension agent gathered production information from experienced grain growers in the 13- to 15-inch rainfall area of Asotin County. A meeting was then arranged between a local grower from the area, the county extension agent, the extension agronomist, and a farm management extension economist to review this information and put together a representative farm. From the information gathered, this group identified the field operations and machinery and inputs commonly used on well managed operations. Local farm suppliers provided current price information on materials and services. Machinery costs were based on replacement prices and on rates of annual use considered typical.

BUDGET ASSUMPTIONS

The following assumptions were made.

1. The representative farm includes 4,500 acres with 1,800 acres in winter wheat, 1,200 acres in spring barley, and 1,500 acres in summer fallow, annually. This farm is larger than the average farm in the area, but reflects the size and type of farm from which the majority of the information was collected.
2. Per-acre yields are 50 bushels for wheat and 1.4 tons for barley. However, yield variability is quite common in Asotin County and variable yields can have a substantial impact on per unit costs.
3. Prices received by the farmer for the budgeted crops are \$4.00 per bushel for winter wheat and \$90.00 per ton for spring barley.
4. Machinery is valued at costs incurred if the item was to be replaced. Machine items on representative size Asotin County farms are typically replaced with used machinery. While valuing machinery at replacement cost may overstate current production costs, it indicates the enterprise's ability to generate earnings needed to replace depreciable assets. Increases in prices mean that depreciation claimed on assets purchased before price advances understates the amount of capital required for asset replacement. When an enterprise is evaluated to determine its long-run viability, it is important to consider its ability to replace depreciable assets on a replaceable cost basis.
5. The interest rate is 9%.
6. The farm is owned, managed, and operated by the same person.

Due to the information and procedure followed, the budget should be viewed as "typical" or "representative" of the given farm size in the area rather than a mathematical average of a

large number of producers. When farm size, machinery complement and use, cultural practices, and yield differ from those assumed in this publication, quite different enterprise costs and returns may result.

DISCUSSION OF BUDGET INFORMATION

The budget information for the spring barley, summer fallow, and winter wheat enterprises is reported in 13 separate tables.

Schedule of Operations and Costs Per Acre

Tables 1, 3, 5, and 7 outline the schedule of field operations by calendar month, the type of machinery used, and the hours used per acre for summer fallow following spring barley, winter wheat following summer fallow, spring barley following winter wheat, and spring barley following spring barley, respectively. The costs are divided into two categories. The first is machinery, grain bins, and land fixed costs. The second category, variable costs, is associated with operating machinery, labor, and purchasing services and materials. Total cost is the sum of fixed and variable costs.

Machinery and grain bin fixed costs include depreciation, interest on the average investment, property taxes, and insurance. These costs do not vary with the crops produced, given the ownership of a specific machinery and grain bin complement, and are incurred whether or not a crop is grown.

Machinery fixed costs for a specific field operation are determined by multiplying the machine hours per acre times the per-hour fixed cost (Table 10). The per-hour fixed cost figures are determined by dividing the total fixed cost figures by the annual hours of machinery use for the representative farm. The grain bin and auger fixed cost expenses are calculated on a per-acre basis.

Land fixed costs include taxes and net rent that is based on rental agreements typical for the area minus expenditures typically covered by the landlord. The typical lease agreement is one-third landlord and two-thirds tenant crop share with the landlord paying land taxes, one-third the fertilizer and chemical costs, and one-third the crop insurance cost. The tenant covers all other production expenses.

Thus, net rent for summer fallow-winter wheat is calculated as follows:

\$66.67	(1/3 Gross receipts from production)
4.00	(Land tax; for summer fallow and winter wheat)
7.38	(1/3 Fertilizer, chemical, and crop insurance costs)
<hr/>	
\$55.29	Net rent per acre

Net rent for spring barley following wheat is calculated as follows:

\$42.00	(1/3 Gross receipts from production)
2.00	(Land tax)
<u>5.87</u>	(1/3 Fertilizer, chemical, and crop insurance costs)
\$34.13	Net rent per acre

Net rent for spring barley following spring barley is calculated as follows:

\$42.00	(1/3 Gross receipts from production)
2.00	(Land tax)
<u>5.64</u>	(1/3 Fertilizer, chemical, and crop insurance costs)
\$34.36	Net rent per acre

While the owner-operator obviously will not experience a land rental cost, the cost represents the minimum returns the owner-operator must have to justify growing this crop on the land himself. This net rental return represents the income the owner-operator forgoes by producing this crop himself rather than renting the land to a tenant. As a result of investing in land, the farmer receives both current returns from farming and any long-term land value appreciation. However, the farmer would continue to receive land value appreciation even if the land were rented out. Consequently, the appropriate land charge is only the net rent lost. As used in this publication, land cost is termed an opportunity cost to indicate that it is not an out-of-pocket expense, but rather a foregone return. To determine the profitability of crop production relative to other activities, the owner-operator may want to consider these foregone returns, or opportunity costs, along with the usual production expenses. Of course, for the individual producer, any land costs that are actual cash costs, such as interest payments on loans outstanding on land or land rent payments, must be identified and treated as cash costs.

In Table 3, the previous year's summer fallow costs, plus a 9% interest charge, are included as part of the fixed cost of raising winter wheat. Summer fallow costs are allocated to winter wheat because of the need to conserve moisture to support winter wheat. However, in this publication profitability is calculated in terms of the rotation (Tables 11 and 12) of which summer fallow costs are part of the rotational costs and are assigned to the rotation and not specifically to the wheat enterprise.

Variable costs vary directly with the crop grown and the number of acres produced. These variable costs include fuel, oil, repairs, fertilizer, chemicals, custom work, overhead, and interest on operating capital. Machine operating labor, including that provided by the owner-operator, is also included as a variable cost.

Itemized Production Costs Per Acre

Tables 2, 4, 6, and 8 itemize the costs appearing in the "Schedule of Operations and Costs Per Acre" for summer fallow, winter wheat, spring barley following winter wheat and spring barley

following spring barley, respectively. Most of the items are self explanatory or have been previously explained. Two entries, "Machinery Interest" and "Tractor Interest," need additional explanation.

Machinery and tractor interest cost is calculated on the average annual investment in the equipment. The formula used to calculate the average annual machinery investment is

$$\frac{\text{Purchase Cost} + \text{Salvage Value}}{2}$$

The 9% interest charge made against this average investment value represents an opportunity cost or interest paid on money borrowed to finance machine purchases, or both. Machinery interest cost for one acre of spring barley, summer fallow, or winter wheat is determined by multiplying the respective machine hours per acre times per hour interest costs (Table 10).

Materials and Services Provided by Operation

The "Schedule of Operation and Estimated Cost Per Acre..." tables for summer fallow, winter wheat, and spring barley, list under the "Service" column and "Materials" column dollar figures for services and materials used by different operations. Table 9 lists by operation, as shown in the respective "Schedule of Operation and Estimated Cost Per Acre..." tables, the specific services and/or material used, the quantities used, and the prices paid.

Per-Hour/Per-Acre Machinery Costs

Most pieces of machinery on representative size Asotin County farms are purchased used. Pickups, however, are generally replaced new. Table 10 presents the types of machines and grain bins used on the representative farm, their current replacement price, annual hours of use, years of life before trade-in, and estimated per-hour fixed and variable costs. The grain bins and auger costs are calculated on a per-acre basis.

Typically, there is more than one unit of each of the machinery items listed on a farm of the representative size. Table 10 simply lists the per-hour or per-acre cost of operating a machine of the given description.

Summary of Receipts, Costs, and Profitability Per Acre

Tables 11 and 12 summarize the per-acre returns, cost and profitability for the spring barley-summer fallow-winter wheat rotation (Rotation #1) and the spring barley-spring barley-summer fallow-winter wheat rotation (Rotation #2), respectively. The profitability of each rotation is calculated over the rotational period, 3 or 4 years as the case may be, with an average annual return being calculated for the rotational period.

The first profit measure is gross receipts, which is the total receipts derived from the crops over the rotational period. The second profit measure is returns over variable costs, calculated by subtracting total variable costs from total receipts. The third profit measure, net returns to management, was calculated by subtracting machinery fixed expenses, interest on summer fallow costs, net rent, and land taxes from returns over variable cost. This is the return the owner-operator realizes to management after accounting for all costs including \$10 per hour for any labor contributed to the production of the crops over the rotational period. The last profit measure is the average annual return to management over the rotational period. Under the given assumptions, Rotation #1 has an average annual return of \$25.85 per acre, while Rotation #2 has an average annual return of \$24.85 per acre.

Prices of Inputs

Prices for material and services used to produce the crops covered in this publication are listed in Table 13.

APPENDIX

Detailed Budget Tables

TABLE 1: SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR SUMMER FALLOW.

OPERATION	TOOLING	MTH	YEAR	MACH	LABOR	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
							FUEL, LUBE, & REPAIRS	MACH LABOR	SERVICE	MATER.	INTER.		
				HOURS	HOURS	\$	\$	\$	\$	\$	\$	\$	\$
APPLY ROUNDUP	250HP-WT W/75' SPRAYER	MAR	1992	0.03	0.03	0.69	0.47	0.33	0.00	3.30	0.15	4.25	4.94
HAUL WATER	2.5 TON TRUCK W/WATER TANK	MAR	1992	0.01	0.01	0.06	0.05	0.07	0.00	0.00	0.00	0.13	0.19
SWEEP	250HP-WT W/22' CHISEL	MAY	1992	0.10	0.11	2.31	2.23	1.10	0.00	0.00	0.07	3.40	5.71
CULTIWEED/HARROW	250HP-WT W/36' CULTIWD/HARROW	JUN	1992	0.06	0.07	1.27	1.24	0.69	0.00	0.00	0.03	1.96	3.22
CULTIWEED/HARROW	250HP-WT W/36' CULTIWD/HARROW	JUL	1992	0.06	0.07	1.27	1.24	0.69	0.00	0.00	0.01	1.94	3.21
WEED CONTROL	4WD ATV W/SPRAYER	ANN	1992	0.01	0.01	0.11	0.04	0.12	0.00	0.25	0.02	0.44	0.55
MACHINE TRANSPT	2.5 TON TRUCK	ANN	1992	0.01	0.01	0.06	0.07	0.11	0.00	0.00	0.01	0.19	0.25
MISC USE	3/4 TON PICKUP	ANN	1992	0.12	0.13	0.65	0.57	1.30	0.00	0.00	0.08	1.95	2.60
MISC USE	35HP-WT W/LOADER	ANN	1992	0.01	0.01	0.14	0.09	0.09	0.00	0.00	0.01	0.19	0.33
OVERHEAD	UTILITIES, LEGAL, ACCT, ETC.	ANN	1992	0.00	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.72	0.72
TAXES	LAND TAXES	ANN	1992	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
TOTAL PER ACRE				0.41	0.45	8.56	6.01	4.49	0.72	3.55	0.40	15.17	23.73

TABLE 2: ITEMIZED COSTS PER ACRE FOR SUMMER FALLOW.

	UNIT	PRICE OR COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS		\$		\$	
ROUNDUP	OZ.	0.28	12.00	3.30	_____
SPOT WEED SPRAY	ACRE	0.25	1.00	0.25	_____
TRACTOR REPAIR	ACRE	1.48	1.00	1.48	_____
TRACTOR FUEL/LUBE	ACRE	2.32	1.00	2.32	_____
MACHINERY REPAIRS	ACRE	1.88	1.00	1.88	_____
MACHINE FUEL/LUBE	ACRE	0.32	1.00	0.32	_____
LABOR(TRAC/MACH)	ACRE	4.49	1.00	4.49	_____
OVERHEAD	ACRE	0.72	1.00	0.72	_____
INTEREST ON OP. CAP.	DOL.	0.09	4.39	0.40	_____
TOTAL VARIABLE COST				15.17	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	1.75	1.00	1.75	_____
TRACTOR INTEREST*	ACRE	1.44	1.00	1.44	_____
TRACTOR INSURANCE	ACRE	0.10	1.00	0.10	_____
TRACTOR TAXES	ACRE	0.29	1.00	0.29	_____
TRACTOR HOUSING	ACRE	0.16	1.00	0.16	_____
MACHINE DEPRECIATION	ACRE	1.38	1.00	1.38	_____
MACHINE INTEREST*	ACRE	1.05	1.00	1.05	_____
MACHINE INSURANCE	ACRE	0.07	1.00	0.07	_____
MACHINE TAXES	ACRE	0.21	1.00	0.21	_____
MACHINE HOUSING	ACRE	0.12	1.00	0.12	_____
LAND TAXES	ACRE	2.00	1.00	2.00	_____
TOTAL FIXED COST				8.56	_____
TOTAL COST				23.73	_____

* 9% OPPORTUNITY COST ON THE AVERAGE VALUE OF MACHINERY INVESTMENT OVER THE USEFUL LIFE.

TABLE 3: SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR WINTER WHEAT FOLLOWING SUMMER FALLOW.

OPERATION	TOOLING	MTH	YEAR	MACH	LABOR	TOTAL FIXED COST	VARIABLE COST					TOTAL VARIABLE COST	TOTAL COST
							FUEL, LUBE, & REPAIRS	MACH LABOR	SERVICE	MATER.	INTER.		
				HOURS	HOURS	\$	\$	\$	\$	\$	\$	\$	\$
CULTIWEED/HARROW	250HP-WT W/36' CULTIWD/HARROW	SEP	1991	0.06	0.07	1.27	1.24	0.69	0.00	0.00	0.16	2.09	3.35
FERT & SEED*	250HP-WT W/32' DEEP FUR. DRILL	SEP	1991	0.08	0.09	2.29	1.63	0.92	0.00	15.92	1.52	19.99	22.29
HAUL SEED & FERT	2.5 TON TRUCK	SEP	1991	0.01	0.01	0.04	0.04	0.07	0.00	0.00	0.01	0.12	0.16
SPRAY WEEDS	250HP-WT W/75' SPRAYER	MAR	1992	0.03	0.03	0.69	0.47	0.33	0.00	3.83	0.17	4.80	5.50
HAUL WATER	2.5 TON TRUCK W/WATER TANK	MAR	1992	0.01	0.01	0.06	0.05	0.07	0.00	0.00	0.00	0.13	0.19
CROP INSURANCE	FED. CROP & HAIL AND FIRE INS.	MAY	1992	0.00	0.00	0.00	0.00	0.00	6.50	0.00	0.15	6.65	6.65
HARVEST	25' LEVEL LAND COMBINE	JUL	1992	0.08	0.09	1.55	1.37	0.88	0.00	0.00	0.02	2.26	3.81
HARVEST	18' HILLSIDE COMBINE	JUL	1992	0.06	0.06	0.49	1.13	0.63	0.00	0.00	0.01	1.77	2.26
HAUL GRAIN	TWO 2.5 TON TRUCKS	JUL	1992	0.13	0.17	0.79	0.89	1.25	0.00	0.00	0.02	2.16	2.94
STORAGE	HOME GRAIN STORAGE BINS	ANN	1992	0.00	0.00	1.95	0.25	0.00	0.00	0.00	0.01	0.26	2.21
HAUL TO RIVER	SEMI TRUCK AND TRAILER	ANN	1992	0.08	0.09	1.45	1.27	0.89	0.00	0.00	0.10	2.26	3.71
MACHINE TRANSPT	2.5 TON TRUCK	ANN	1992	0.01	0.01	0.06	0.07	0.11	0.00	0.00	0.01	0.19	0.25
WEED CONTROL	4WD ATV W/SPRAYER	ANN	1992	0.01	0.01	0.21	0.06	0.12	0.00	0.25	0.02	0.45	0.66
MISC USE	3/4 TON PICKUP	ANN	1992	0.12	0.13	0.65	0.57	1.30	0.00	0.00	0.08	1.95	2.60
MISC USE	35HP-WT W/LOADER	ANN	1992	0.02	0.02	0.28	0.18	0.17	0.00	0.00	0.02	0.37	0.65
OVERHEAD	UTILITIES, LEGAL, ACCT, ETC.	ANN	1992	0.00	0.00	0.00	0.00	0.00	2.27	0.00	0.00	2.27	2.27
TAXES	LAND TAXES	ANN	1992	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
LAND COST	NET LAND RENT	ANN	1992	0.00	0.00	55.29	0.00	0.00	0.00	0.00	0.00	0.00	55.29
SUM. FALLOW COST	SUM. FALLOW COST + INTEREST	ANN	1992	0.00	0.00	25.87	0.00	0.00	0.00	0.00	0.00	0.00	25.87
TOTAL PER ACRE				0.69	0.62	94.93	9.23	7.43	8.77	20.00	2.30	47.73	142.66

* RESEED ABOUT 1 IN EVERY 10 YEARS.

TABLE 4: ITEMIZED COSTS PER ACRE FOR WINTER WHEAT FOLLOWING SUMMER FALLOW.

	UNIT	PRICE OR COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS		\$		\$	
WHEAT SEED	LB.	0.12	66.00	7.92	_____
ANHYDROUS NITROGEN	LB.	.20	40.00	8.00	_____
GLEAN	OZ.	20.00	0.17	3.33	_____
SPREADER ACTIVATOR	ACRE	.50	1.00	0.50	_____
SPOT WEED SPRAY	ACRE	0.25	1.00	0.25	_____
CROP INSURANCE	ACRE	6.50	1.00	6.50	_____
TRACTOR REPAIR	ACRE	1.12	1.00	1.12	_____
TRACTOR FUEL/LUBE	ACRE	1.42	1.00	1.42	_____
MACHINERY REPAIRS	ACRE	5.31	1.00	5.31	_____
MACHINE FUEL/LUBE	ACRE	1.38	1.00	1.38	_____
LABOR(TRAC/MACH)	ACRE	6.17	1.00	6.17	_____
TRUCK DRIVERS	HOUR	7.50	0.17	1.25	_____
OVERHEAD	ACRE	2.27	1.00	2.27	_____
INTEREST ON OP. CAP.	DOL.	0.09	25.54	2.30	_____
TOTAL VARIABLE COST				47.73	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	1.29	1.00	1.29	_____
TRACTOR INTEREST*	ACRE	1.07	1.00	1.07	_____
TRACTOR INSURANCE	ACRE	0.07	1.00	0.07	_____
TRACTOR TAXES	ACRE	0.21	1.00	0.21	_____
TRACTOR HOUSING	ACRE	0.12	1.00	0.12	_____
MACHINE DEPRECIATION	ACRE	4.26	1.00	4.26	_____
MACHINE INTEREST*	ACRE	3.52	1.00	3.52	_____
MACHINE INSURANCE	ACRE	0.23	1.00	0.23	_____
MACHINE TAXES	ACRE	.70	1.00	0.70	_____
MACHINE HOUSING	ACRE	0.29	1.00	0.29	_____
SUMMER FALLOW COST**	ACRE	23.73	1.09	25.87	_____
LAND TAXES	ACRE	2.00	1.00	2.00	_____
NET LAND RENT***	ACRE	55.29	1.00	55.29	_____
TOTAL FIXED COST				94.93	_____
TOTAL COST				142.66	_____

* 9% OPPORTUNITY COST ON THE AVERAGE VALUE OF MACHINERY INVESTMENT OVER THE USEFUL LIFE.

** SUMMER FALLOW COST OF PREVIOUS YEAR PLUS 9% INTEREST.

*** \$66.67 GROSS RENT LESS REAL ESTATE TAXES AND ONE-THIRD FERTILIZER, CHEMICAL, AND CROP INSURANCE COSTS.

TABLE 5: SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR SPRING BARLEY FOLLOWING WINTER WHEAT.

OPERATION	TOOLING	MTH	YEAR	MACH	LABOR	VARIABLE COST							TOTAL VARIABLE COST	TOTAL COST
						TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	MACH LABOR	SERVICE	MATER.	INTER.			
						HOURS	HOURS	\$	\$	\$	\$	\$		
DISK	250HP-WT W/22'DISK	SEP	1991	0.10	0.11	2.62	2.14	1.10	0.00	0.00	0.27	3.51	6.13	
CULTIWEED/HARROW	250HP-WT W/36' CULTIWEED/TINE	MAR	1992	0.08	0.09	1.69	1.40	0.92	0.00	0.00	0.09	2.41	4.09	
FERTILIZE	250HP-WT W/51' DEALER FERT SPR	MAR	1992	0.05	0.06	0.64	0.53	0.55	0.00	12.00	0.49	13.57	14.21	
HAUL FERTILIZER	2.5 TON TRUCK	MAR	1992	0.00	0.00	0.02	0.02	0.04	0.00	0.00	0.00	0.06	0.08	
CUTIVATE/HARROW	250HP-WT W/42' CULTIVATOR/TINE	MAR	1992	0.07	0.07	1.94	1.35	0.73	0.00	0.00	0.08	2.16	4.10	
PLANT	250HP-WT W/36' DBL. DISK DRILL	APR	1992	0.10	0.11	2.11	1.68	1.10	0.00	7.00	0.29	10.07	12.18	
HAUL SEED	2.5 TON TRUCK	APR	1992	0.00	0.00	0.02	0.02	0.04	0.00	0.00	0.00	0.06	0.08	
SPRAY WEEDS	250HP-WT W/75' SPRAYER	MAY	1992	0.03	0.03	0.69	0.47	0.33	0.00	1.36	0.05	2.21	2.90	
HAUL WATER	2.5 TON TRUCK W/WATER TANK	MAY	1992	0.01	0.01	0.06	0.05	0.07	0.00	0.00	0.00	0.12	0.19	
CROP INSURANCE	FED. CROP & HAIL AND FIRE INS.	MAY	1992	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.09	4.09	4.09	
HARVEST	18' HILLSIDE COMBINE	JUL	1992	0.06	0.06	0.49	1.13	0.63	0.00	0.00	0.01	1.77	2.26	
HARVEST	25' LEVEL LAND COMBINE	JUL	1992	0.08	0.09	1.55	1.37	0.88	0.00	0.00	0.02	2.26	3.81	
HAUL GRAIN	TWO 2.5 TON TRUCKS	JUL	1992	0.13	0.17	0.79	0.89	1.25	0.00	0.00	0.02	2.16	2.94	
STORAGE	HOME GRAIN STORAGE BINS	ANN	1992	0.00	0.00	1.95	0.25	0.00	0.00	0.00	0.01	0.26	2.21	
HAUL TO RIVER	SEMI TRUCK AND TRAILER	ANN	1992	0.08	0.09	1.45	1.27	0.89	0.00	0.00	0.10	2.26	3.71	
MACHINE TRANSP	2.5 TON TRUCK	ANN	1992	0.01	0.01	0.06	0.07	0.11	0.00	0.00	0.01	0.19	0.25	
WEED CONTROL	4WD ATV W/SPRAYER	ANN	1992	0.01	0.01	0.21	0.06	0.12	0.00	0.25	0.02	0.45	0.66	
MISC USE	3/4 TON PICKUP	ANN	1992	0.12	0.13	0.65	0.57	1.30	0.00	0.00	0.08	1.95	2.60	
MISC USE	35HP-WT W/LOADER	ANN	1992	0.02	0.02	0.28	0.18	0.17	0.00	0.00	0.02	0.37	0.65	
OVERHEAD	UTILITIES, LEGAL, ACCT, ETC.	ANN	1992	0.00	0.00	0.00	0.00	0.00	2.50	0.00	0.00	2.50	2.50	
TAXES	LAND TAXES	ANN	1992	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	
LAND COST	NET LAND RENT	ANN	1992	0.00	0.00	34.13	0.00	0.00	0.00	0.00	0.00	0.00	34.13	
TOTAL PER ACRE				0.94	1.07	53.35	13.46	10.22	6.50	20.61	1.64	52.43	105.78	

TABLE 6: ITEMIZED COSTS PER ACRE FOR SPRING BARLEY FOLLOWING WINTER WHEAT.

	UNIT	PRICE OR COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS		\$		\$	
BARLEY SEED	LB.	.10	70.00	7.00	_____
ANHYDROUS NITROGEN	LB.	.20	40.00	8.00	_____
SULFUR	LB.	.40	10.00	4.00	_____
2-4-D	PINT	1.36	1.00	1.36	_____
SPOT WEED SPRAY	ACRE	0.25	1.00	0.25	_____
CROP INSURANCE	ACRE	4.00	1.00	4.00	_____
TRACTOR REPAIR	ACRE	2.50	1.00	2.50	_____
TRACTOR FUEL/LUBE	ACRE	2.77	1.00	2.77	_____
MACHINERY REPAIRS	ACRE	6.82	1.00	6.82	_____
MACHINE FUEL/LUBE	ACRE	1.38	1.00	1.38	_____
LABOR(TRAC/MACH)	ACRE	8.97	1.00	8.97	_____
TRUCK DRIVERS	HOUR	7.50	0.17	1.25	_____
OVERHEAD	ACRE	2.50	1.00	2.50	_____
INTEREST ON OP. CAP.	DOL.	0.09	18.26	1.64	_____
TOTAL VARIABLE COST				52.43	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	2.95	1.00	2.95	_____
TRACTOR INTEREST*	ACRE	2.42	1.00	2.42	_____
TRACTOR INSURANCE	ACRE	0.16	1.00	0.16	_____
TRACTOR TAXES	ACRE	0.48	1.00	0.48	_____
TRACTOR HOUSING	ACRE	0.27	1.00	0.27	_____
MACHINE DEPRECIATION	ACRE	5.12	1.00	5.12	_____
MACHINE INTEREST*	ACRE	4.29	1.00	4.29	_____
MACHINE INSURANCE	ACRE	0.29	1.00	0.29	_____
MACHINE TAXES	ACRE	0.86	1.00	0.86	_____
MACHINE HOUSING	ACRE	0.38	1.00	0.38	_____
NET LAND RENT**	ACRE	34.13	1.00	34.13	_____
LAND TAXES	ACRE	2.00	1.00	2.00	_____
TOTAL FIXED COST				53.35	_____
TOTAL COST				105.78	_____

* 9% OPPORTUNITY COST ON THE AVERAGE VALUE OF MACHINERY INVESTMENT OVER THE USEFUL LIFE.

** \$42.00 GROSS RENT LESS REAL ESTATE TAXES AND ONE-THIRD FERTILIZER, CHEMICAL, AND CROP INSURANCE COSTS.

TABLE 7: SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR SPRING BARLEY FOLLOWING SPRING BARLEY.

OPERATION	TOOLING	MTH	YEAR	MACH	LABOR	VARIABLE COST						TOTAL VARIABLE COST	TOTAL COST
						TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	MACH LABOR	SERVICE	MATER.	INTER.		
						HOURS	HOURS	\$	\$	\$	\$		
APPLY ROUNDUP	250HP-WT W/75' SPRAYER	APR	1992	0.03	0.03	0.69	0.47	0.33	0.00	3.30	0.12	4.22	4.91
HAUL WATER	2.5 TON TRUCK W/WATER TANK	APR	1992	0.01	0.01	0.06	0.05	0.07	0.00	0.00	0.00	0.12	0.19
FERTILIZE & SEED	250HP-WT W/20' RENTED NO-TILL	APR	1992	0.10	0.11	1.28	1.24	1.10	10.00	19.00	0.94	32.28	33.56
HAUL FERT & SEED	2.5 TON TRUCK	APR	1992	0.01	0.01	0.04	0.04	0.07	0.00	0.00	0.00	0.12	0.16
SPRAY WEEDS	250HP-WT W/75' SPRAYER	MAY	1992	0.03	0.03	0.69	0.47	0.33	0.00	1.36	0.05	2.21	2.90
HAUL WATER	2.5 TON TRUCK W/WATER TANK	MAY	1992	0.01	0.01	0.06	0.05	0.07	0.00	0.00	0.00	0.12	0.19
CROP INSURANCE	FED. CROP & HAIL AND FIRE INS.	MAY	1992	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.09	4.09	4.09
HARVEST	25' LEVEL LAND COMBINE	JUL	1992	0.08	0.09	1.55	1.37	0.88	0.00	0.00	0.02	2.26	3.81
HARVEST	18' HILLSIDE COMBINE	JUL	1992	0.06	0.06	0.49	1.13	0.63	0.00	0.00	0.01	1.77	2.26
HAUL GRAIN	TWO 2.5 TON TRUCKS	JUL	1992	0.13	0.17	0.79	0.89	1.25	0.00	0.00	0.02	2.16	2.94
STORAGE	HOME GRAIN STORAGE BINS	ANN	1992	0.00	0.00	1.95	0.25	0.00	0.00	0.00	0.01	0.26	2.21
HAUL TO RIVER	SEMI TRUCK AND TRAILER	ANN	1992	0.08	0.09	1.45	1.27	0.89	0.00	0.00	0.10	2.26	3.71
MACHINE TRANSPT	2.5 TON TRUCK	ANN	1992	0.01	0.01	0.06	0.07	0.11	0.00	0.00	0.01	0.19	0.25
WEED CONTROL	4WD ATV W/SPRAYER	ANN	1992	0.01	0.01	0.21	0.06	0.12	0.00	0.25	0.02	0.45	0.66
MISC USE	3/4 TON PICKUP	ANN	1992	0.12	0.13	0.65	0.57	1.30	0.00	0.00	0.08	1.95	2.60
MISC USE	35HP-WT W/LOADER	ANN	1992	0.02	0.02	0.28	0.18	0.17	0.00	0.00	0.02	0.37	0.65
OVERHEAD	UTILITIES, LEGAL, ACCT, ETC.	ANN	1992	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	2.74	2.74
TAXES	LAND TAXES	ANN	1992	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
LAND COST	NET LAND RENT	AUG	1992	0.00	0.00	34.36	0.00	0.00	0.00	0.00	0.00	0.00	34.36
TOTAL PER ACRE				0.68	0.78	46.61	8.11	7.32	16.74	23.91	1.49	57.57	104.18

TABLE 8: ITEMIZED COSTS PER ACRE FOR SPRING BARLEY FOLLOWING SPRING BARLEY.

	UNIT	PRICE OR COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS		\$		\$	
BARLEY SEED	LB.	0.10	70.00	7.00	_____
ANHYDROUS NITROGEN	LB.	0.20	40.00	8.00	_____
SULFUR	LB.	0.40	10.00	4.00	_____
ROUNDUP	OZ.	0.28	12.00	3.30	_____
2-4-D	PINT	1.36	1.00	1.36	_____
SPOT WEED SPRAY	ACRE	0.25	1.00	0.25	_____
NO-TILL DRILL	ACRE	10.00	1.00	10.00	_____
CROP INSURANCE	ACRE	4.00	1.00	4.00	_____
TRACTOR REPAIR	ACRE	0.99	1.00	0.99	_____
TRACTOR FUEL/LUBE	ACRE	1.07	1.00	1.07	_____
MACHINERY REPAIRS	ACRE	4.67	1.00	4.67	_____
MACHINE FUEL/LUBE	ACRE	1.39	1.00	1.39	_____
LABOR(TRAC/MACH)	ACRE	6.07	1.00	6.07	_____
TRUCK DRIVERS	HOUR	7.50	0.17	1.25	_____
OVERHEAD	ACRE	2.74	1.00	2.74	_____
INTEREST ON OP. CAP.	DOL.	0.09	16.60	1.49	_____
TOTAL VARIABLE COST				57.57	_____
FIXED COSTS		\$		\$	
TRACTOR DEPRECIATION	ACRE	1.13	1.00	1.13	_____
TRACTOR INTEREST*	ACRE	0.93	1.00	0.93	_____
TRACTOR INSURANCE	ACRE	0.06	1.00	0.06	_____
TRACTOR TAXES	ACRE	0.19	1.00	0.19	_____
TRACTOR HOUSING	ACRE	0.10	1.00	0.10	_____
MACHINE DEPRECIATION	ACRE	3.73	1.00	3.73	_____
MACHINE INTEREST*	ACRE	3.06	1.00	3.06	_____
MACHINE INSURANCE	ACRE	0.20	1.00	0.20	_____
MACHINE TAXES	ACRE	0.61	1.00	0.61	_____
MACHINE HOUSING	ACRE	0.24	1.00	0.24	_____
NET LAND RENT**	ACRE	34.36	1.00	34.36	_____
LAND TAXES	ACRE	2.00	1.00	2.00	_____
TOTAL FIXED COST				46.61	_____
TOTAL COST				104.18	_____

* 9% OPPORTUNITY COST ON THE AVERAGE VALUE OF MACHINERY INVESTMENT OVER THE USEFUL LIFE.

** \$42.00 GROSS RENT LESS REAL ESTATE TAXES AND ONE-THIRD FERTILIZER, CHEMICAL, AND CROP INSURANCE COSTS.

TABLE 9: MATERIALS AND SERVICES PROVIDED BY OPERATION TO PRODUCE WINTER WHEAT AND SPRING BARLEY.

OPERATION	MONTH	MATERIAL AND/OR SERVICE
SUMMER FALLOW:		
APPLY ROUNDUP	MARCH	12 OZS. OF ROUNDUP @ 27.5¢/OZ.
WEED CONTROL	ANNUAL	SPOT WEED SPRAY @ 25¢/ACRE
OVERHEAD	ANNUAL	5% OF VARIABLE COST
WINTER WHEAT FOLLOWING		
SUMMER FALLOW:		
FERTILIZE AND SEED	SEPT.	66 LBS. OF WHEAT SEED @ 12¢/LB. 40 LBS. OF ANHYDROUS NITROGEN @ 20¢/LB.
SPRAY WEEDS	MARCH	0.1665 OZS. OF GLEAN @ 12¢/OZ. SPREADER ACTIVATOR @ 50¢/ACRE
CROP INSURANCE	MAY	FEDERAL CROP, AND HAIL & FIRE INSURANCE @ \$6.50/ACRE
WEED CONTROL	ANNUAL	SPOT WEED SPRAY @ 25¢/ACRE
OVERHEAD	ANNUAL	5% OF VARIABLE COST
SPRING BARLEY		
FOLLOWING WHEAT:		
FERTILIZE	MARCH	40 LBS. OF ANHYDROUS NITROGEN @ 20¢/LB. 10 LBS. OF SULFUR @ 40 ¢/LB.
PLANT	APRIL	70 LBS. OF BARLEY SEED @ 10¢/LB.
SPRAY WEEDS	MAY	1 PINT OF 2-4-D @ \$1.36/PINT
CROP INSURANCE	MAY	FEDERAL CROP, AND HAIL & FIRE INSURANCE @ \$4.00/ACRE
WEED CONTROL	ANNUAL	SPOT WEED SPRAY @ 25¢/ACRE
OVERHEAD	ANNUAL	5% OF VARIABLE COST
SPRING BARLEY FOLLOWING		
SPRING BARLEY:		
APPLY ROUNDUP	APRIL	12 OZS. OF ROUNDUP @ 27.5¢/OZ.
FERTILIZER AND SEED	APRIL	70 LBS. OF BARLEY SEED @ 10¢/LB. 40 LBS. OFF ANHYDROUS NITROGEN @ 20¢/LB. 10 LBS. OF SULFUR @ 40 ¢/LB.
SPRAY WEEDS	MAY	1 PINT OF 2-4-D @ \$1.36/PINT
CROP INSURANCE	MAY	FEDERAL CROP, AND HAIL & FIRE INSURANCE @ \$4.00/ACRE
WEED CONTROL	ANNUAL	SPOT WEED SPRAY @ 25¢/ACRE
OVERHEAD	ANNUAL	5% OF VARIABLE COST

TABLE 10: PER-HOUR/PER-ACRE MACHINERY COSTS.

MACHINERY	PURCHASE PRICE*	YEARS TO TRADE	ANNUAL HOURS	DEPRECIATION	INTEREST	INSURANCE	TAXES	HOUSING	TOTAL FIXED COST	REPAIR	FUEL AND LUBE	TOTAL VARIABLE COST	TOTAL COST
	\$								COST PER HOUR (\$)				
250HP-WT**	60,000.00	15	600	6.03	4.93	0.33	0.99	0.55	12.82	5.00	9.20	14.20	27.02
35HP-WT W/LOADER	12,000.00	20	75	8.00	7.20	0.48	1.44	0.80	17.92	10.00	1.84	11.84	29.76
25' LVLD COMBINE	30,000.00	10	240	10.14	6.69	0.45	1.34	0.74	19.35	12.50	4.60	17.10	36.45
18' HILLSID COMBINE	10,000.00	10	180	4.51	2.97	0.20	0.59	0.33	8.60	16.67	3.22	19.89	28.49
2.5 TON TRUCK	13,000.00	15	265	2.96	2.42	0.16	0.48	0.27	6.29	5.66	1.47	7.13	13.42
SEMI-TRUCK & TRAIL	40,000.00	20	250	8.00	7.20	0.48	1.44	0.80	17.92	12.00	3.68	15.68	33.60
3/4 TON PICKUP	16,000.00	7	540	3.15	1.67	0.11	0.33	0.19	5.46	2.37	2.42	4.78	10.24
4WD ATV	3,000.00	10	50	4.94	3.18	0.21	0.64	0.35	9.32	1.50	1.21	2.71	12.02
ATV SPRAYER	250.00	10	45	0.56	0.25	0.02	0.05	0.03	0.90	1.33	0.00	1.33	2.23
75' SPRAYER	12,000.00	20	150	4.00	3.60	0.24	0.72	0.40	8.96	5.00	0.00	5.00	13.96
22' CHISEL	12,000.00	20	150	4.00	3.60	0.24	0.72	0.40	8.96	6.67	0.00	6.67	15.63
22' DISK	13,000.00	20	120	5.42	4.88	0.33	0.98	0.54	12.13	8.33	0.00	8.33	20.47
36' CULTIWEED/TINE	9,600.00	15	200	2.89	2.37	0.16	0.47	0.26	6.15	5.25	0.00	5.25	11.40
42' CULTIVATE/TINE	12,000.00	20	90	6.67	6.00	0.40	1.20	0.67	14.93	6.67	0.00	6.67	21.60
32' DEEP FUR. DRILL	18,000.00	20	150	6.00	5.40	0.36	1.08	0.60	13.44	6.00	0.00	6.00	19.44
36' DBL. DISK DRILL	7,500.00	20	120	3.13	2.81	0.19	0.56	0.31	7.00	6.25	0.00	6.25	13.25
1700 GALLON TANK	1,700.00	20	50	1.70	1.53	0.10	0.31	0.17	3.81	1.00	0.00	1.00	4.81
			ACRES COVERED						COST PER ACRE (\$)				
15 GRAIN BINS	52,500.00	30	3000	0.58	0.79	0.05	0.16	0.00	1.58	0.00	0.00	0.00	1.58
2 AUGERS	7,000.00	10	3000	0.23	0.11	0.01	0.02	0.00	0.37	0.25	0.00	0.25	0.62

* PRICES SHOWN, WITH THE EXCEPTION OF THE PICKUP, ARE PRICES PAID FOR USED REPLACEMENT EQUIPMENT.

** SHOWS COST OF 250HP WHEEL TRACTOR BURNING FUEL AT A RATE OF 10 GALLONS PER HOUR. OTHER FUEL RATES USED FOR THIS TRACTOR IN THIS STUDY WERE 9, 8, 7.5, 6, AND 5 GALLONS PER HOUR.

Table 11: Summary of Receipts, Costs, and Profitability Per Acre for a Spring Barley-Summer Fallow-Winter Wheat Rotation Over a 3-Year Period.

	Price/Unit	Quantity	Value or Cost
	\$		\$
Gross Receipts From Production			
Barley	90.00	1.4 Tons	126.00
Wheat	4.00	50 Bu.	<u>200.00</u>
1. Total Receipts			326.00
Less: Variable Cost For:			
Spring Barley			52.43
Summer Fallow			15.17
Winter Wheat			<u>47.73</u>
2. Returns Over Variable Cost			210.67
Less: Tractor & Machinery			
Fixed Cost For:			
Spring Barley			17.22
Summer Fallow			6.56
Winter Wheat			11.77
Interest on Summer			
Fallow Costs			2.14
Net Land Rent For:			
Spring Barley			34.13
Summer Fallow/Winter Wheat			55.29
Land Taxes (3 Years)			<u>6.00</u>
3. Net Return to Management			
Over a 3-Year Period			77.56
4. Average Annual Returns to Management			<u>25.85</u>

Table 12: Summary of Receipts, Costs, and Profitability Per Acre for a Spring Barley-Spring Barley-Summer Fallow-Winter Wheat Rotation Over a 4-Year Period.

	Price/Unit	Quantity	Value or Cost
	\$		\$
Gross Receipts From Production			
Barley (2 Yrs. of Prod.)	90.00	2.8 Tons	252.00
Wheat	4.00	50 Bu.	200.00
1. Total Receipts			452.00
Less: Variable Cost For:			
Spring Barley (1st Year)			52.43
Spring Barley (2nd Year)			57.57
Summer Fallow			15.17
Winter Wheat			47.73
2. Returns Over Variable Cost			279.1
Less: Tractor & Machinery			
Fixed Cost For:			
Spring Barley (1st Year)			17.22
Spring Barley (2nd Year)			10.25
Summer Fallow			6.56
Winter Wheat			11.77
Interest on Summer			
Fallow Costs			2.14
Net Land Rent For:			
Spring Barley (1st Year)			34.13
Spring Barley (2nd Year)			34.36
Summer Fallow/Winter Wheat			55.29
Land Taxes (4 Years)			8.00
3. Net Return to Management			
Over a 4-Year Period			99.38
4. Average Annual Returns to Management			24.85

Table 13: Prices of Inputs

	Unit	Price
		\$
Services:		
Federal crop, and hail & fire	Acre	6.50
Federal crop, and hail & fire	Acre	4.00
Materials:		
Gasoline	Gal.	1.05
Diesel	Gal.	0.80
Roundup	Oz.	0.28
Spot Weed Spray	Acre	0.25
Glean	Oz.	20.00
Spreader Activator	Acre	0.50
2-4-D	Pint	1.36
Anhydrous Nitrogen	Lb.	0.20
Sulfur	Lb.	0.40
Wheat Seed	Lb.	0.12
Barley Seed	Lb.	0.10
Labor:		
Machine Operators	Hour	10.00
Truck Drivers	Hour	10.00
Truck Spotters	Hour	5.00

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