Understanding and Using WSU Crop Enterprise Budgets[1]

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Washington State University Cooperative Extension develops crop enterprise budgets for many of the major crops grown throughout Washington State. The purposes of these budgets are to estimate the costs and returns from producing these crops for research and policy purposes and to provide producers and their credit providers with a tool to use in enterprise selection and financing.

To construct an enterprise budget, a group of progressive producers is assembled by the extension agent in the area. The agent and a farm management specialist from WSU work with this group to develop a consensus estimate of enterprise costs and returns. It is fully realized by those involved in this process that the resulting enterprise budget does not represent any one particular farm and must be modified by the individual producer to fit their situation. However, the resulting budget is a reasonable estimate for the area.

Producers reviewing these published budgets often state that their own costs are significantly lower than those presented in the WSU budgets. Furthermore, others outside the industry may question the cost estimates and "break-even" prices stating that "since some WSU budgets show producers are operating at a loss, how do they stay in business?" To adequately address these concerns and questions, one must understand both the difference between "economic" and "cash" budgets and also how an economic budget can be used to develop a cash budget.

WSU enterprise budgets are economic budgets. The budget shown in Table 1 is a published wheat budget for the 18- to 22-inch rainfall area of Columbia County, Washington. In developing this budget, it was assumed that the representative farm includes 1,500 acres with 750 acres in winter wheat, 500 acres in peas, and 250 acres of other crops, grass or summer fallow annually. The wheat yield is assumed to be 70 bushels per acre.

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Table 1. WSU Economic Enterprise Budget:
1997 ITEMIZED COST PER ACRE FOR WINTER WHEAT FOLLOWING DRY PEAS, COLUMBIA COUNTY, WASHINGTON, 18- TO 22-INCH RAINFALL AREA.

	UNIT	PRICE OR COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS		$		$	
NITROGEN (AI)	LB.	.32	80.00	25.20	_ _ _ _ _ _
SULFUR (AI)	LB.	.48	12.00	5.76	_ _ _ _ _ _
WHEAT SEED	LB.	.12	85.00	10.20	_ _ _ _ _ _
FARGO	LB.	1.15	3.00	3.45	_ _ _ _ _ _
LANDMASTER	OZ.	.18	54.00	9.72	_ _ _ _ _ _
HERBICIDE/FUNGICIDE	ACRE	20.00	1.00	20.00	_ _ _ _ _ _
CUSTOM AERIAL	ACRE	4.50	1.50	6.75	_ _ _ _ _ _
50' SPRAYER	ACRE	1.50	.70	1.05	_ _ _ _ _ _
CROP INSURANCE	ACRE	3.50	1.00	3.50	_ _ _ _ _ _
MACHINERY REPAIRS	ACRE	29.59	1.00	29.59	_ _ _ _ _ _
MACHINE FUEL/LUBE	ACRE	9.05	1.00	9.05	_ _ _ _ _ _
LABOR	HOUR	12.00	2.18	26.18	_ _ _ _ _ _
OVERHEAD	ACRE	9.56	1.00	9.56	_ _ _ _ _ _
INTEREST ON OP. CAP.	ACRE	8.87	1.00	8.87	_ _ _ _ _ _

TOTAL VARIABLE COST				168.88	_ _ _ _ _ _
FIXED COSTS		$		$	
MACHINE DEPRECIATION	ACRE	17.07	1.00	17.07	_ _ _ _ _ _
MACHINE INTEREST	ACRE	17.11	1.00	17.11	_ _ _ _ _ _
MACHINE INSURANCE	ACRE	.98	1.00	.98	_ _ _ _ _ _
MACHINE TAXES	ACRE	2.93	1.00	2.93	_ _ _ _ _ _
MACHINE HOUSING	ACRE	1.63	1.00	1.63	_ _ _ _ _ _
LAND TAX	ACRE	5.00	1.00	5.00	_ _ _ _ _ _
NET RENT	ACRE	82.10	1.00	82.10	_ _ _ _ _ _

TOTAL FIXED COST				126.82	_ _ _ _ _ _
TOTAL COST				295.70	_ _ _ _ _ _

BREAK-EVEN PRICE @ 70 BUSHELS PER ACRE = $295.70/70 BU. = $4.22/BU.

This budget indicates the total cost (excluding management) per acre to produce winter wheat is $295.70 and that to break-even the producer must clear $4.22 per bushel, net of marketing and transportation costs. Any price received above $4.22 per bushel is a return to the producer for management and risk.

While individual producers may differ relative to the type and amount of inputs and the yield, the main source of confusion is the cost of owned capital, labor, and land. To fully understand WSU enterprise budgets, one must understand the concept of "opportunity" cost. Opportunity cost is the revenue lost by not investing in the next best similiar risk alternative. For instance, if a producer invests $50,000 of equity capital in machinery, the producer gives up the alternative of investing this money in the stock market or paying off a current loan. Thus, if the producer is to realize an "economic" profit, the machinery investment must realize a return greater than that associated with the next best alternative. If the next best alternative happens to be paying off a current loan with 10% annual interest, economic profits are not realized until a net return greater than $5,000 is realized by the equipment investment. Thus, WSU enterprise budgets reflect an interest cost on both owned and borrowed capital.

The same is true for operator labor and owned land. In calculating labor costs for WSU enterprise budgets, operator and family labor are valued at their opportunity cost of being hired out to a neighboring farmer. For land that is owned, the opportunity cost that is included in the WSU budget is the net rental return that the producer would receive if the land was rented out rather than being used by the producer. In short, it is assumed that the owner of capital assets and unpaid labor wants a "fair" market return for these resources. If full economic costs are not covered, a less than "fair" market return is being realized on these resources.

Since most producers have equity in their farm business and provide much of the labor associated with running their operation, in order to determine a particular producer's cash costs, adjustments must be made to the WSU budget. Let us assume, for example, a producer in Columbia County agrees with all the WSU budget figures except interest, labor, and land costs. This owner-operator owns all land and equipment and furnishes 75% of all labor used on the farm. Furthermore, this person's estimated annual

principal and interest (P&I payment(s)) on his land loan(s) total approximately $33,000. His estimated annual P&I payment(s) on his machinery loan(s) total approximately $32,000. In addition, he estimates during the year he will equity finance $20,000 worth of machinery purchases. Labor costs are $12 per hour including Social Security and Labor and Industry payments. To keep things simple, it will be assumed that all P&I payments and equity financed machinery purchases are to be allocated equally among the 1,500 acres being farmed regardless of the crops produced.

To convert the WSU economic budget to the producer's cash budget (Table 2), all opportunity costs are eliminated. Thus, the quantity of labor changes from 2.18 total hours per acre to .55 hired labor hours per acre.[2] Tractor depreciation and interest, and machine depreciation and interest are deleted and replaced with the per acre allocation of principal and interest to be paid on the machinery loan(s) of $21.33,[3] along with a line for equity financed machinery purchases of $13.33.[4] Net rent is deleted and replaced with the per acre allocation of principal and interest to be paid on the real estate loan of $22.00.[5] Thus, the total cash cost per acre for the producer is $216.50. Assuming a 70 bushel per acre yield, the break-even cash cost of production is $3.09 per bushel. Revenues received above these costs represent cash returns to unpaid labor and management, equity capital contributions, and risk. Thus, it can be seen why producers that have sizeable equity in their farm business can often "survive" at prices below those determined as breakeven prices by WSU crop enterprise budgets. However, it must still be realized that if the enterprise does not return full cost of production (cash and opportunity), the owner-operator is not earning a return on labor and capital contributions equivalent to those that could be generated by his/her labor and capital contributions if they had been invested in the next best similar risk alternative.

[2] 2.18 hours x .25 = .55 hours
[3] $32,000/1,500 acres = $21.33
[4] $20,000/1,500 acres = $13.33
[5] $33,000/1,500 acres = $22.00

Table 2. Example Cash Enterprise Budget:
1997 ITEMIZED COST PER ACRE FOR WINTER WHEAT FOLLOWING DRY PEAS, COLUMBIA COUNTY, WASHINGTON, 18- TO 22-INCH RAINFALL AREA.

		PRICE OR UNIT COST/UNIT	VALUE OR QUANTITY	COST	YOUR FARM
VARIABLE CASH COSTS		$		$	
NITROGEN (AI)	LB.	.32	80.00	25.20	- - - - - -
SULFUR (AI)	LB.	.48	12.00	5.76	- - - - - -
WHEAT SEED	LB.	.12	85.00	10.20	- - - - - -
FARGO	LB.	1.15	3.00	3.45	- - - - - -
LANDMASTER	OZ.	.18	54.00	9.72	- - - - - -
HERBICIDE/FUNGICIDE	ACRE	20.00	1.00	20.00	- - - - - -
CUSTOM AERIAL	ACRE	4.50	1.50	6.75	- - - - - -
50' SPRAYER	ACRE	1.50	.70	1.05	- - - - - -
CROP INSURANCE	ACRE	3.50	1.00	3.50	- - - - - -
MACHINERY REPAIRS	ACRE	29.59	1.00	29.59	- - - - - -
MACHINE FUEL/LUBE	ACRE	9.05	1.00	9.05	- - - - - -
HIRED LABOR	***HOUR***	***12.00***	***.55***	***6.60***	- - - - - - - -
OVERHEAD	ACRE	9.56	1.00	9.56	- - - - - -
INTEREST ON OP. CAP.	ACRE	8.87	1.00	8.87	- - - - - -

TOTAL VARIABLE CASH COST				***149.30***	- - - - - - - -
FIXED CASH COSTS		$		$	
MACHINE EQUITY RPLMT	ACRE	13.33	1.00	13.33	- - - - - -
MACHINE P&I PAYMENTS	ACRE	21.33	1.00	21.33	- - - - - -
MACHINE INSURANCE	ACRE	.98	1.00	.98	- - - - - -
MACHINE TAXES	ACRE	2.93	1.00	2.93	- - - - - -
MACHINE HOUSING	ACRE	1.63	1.00	1.63	- - - - - -
LAND P&I PAYMENTS	ACRE	22.00	1.00	22.00	- - - - - -
LAND TAX	ACRE	5.00	1.00	5.00	- - - - - -

TOTAL FIXED CASH COST				***67.20***	- - - - - - - -
TOTAL CASH COST				***216.50***	- - - - - - - -

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BREAK-EVEN CASH COST @ 70 BUSHELS PER ACRE = $216.50/70 BU. = $3.09/BU.

Reference:

Hinman, Herbert, Roland Schirman, 1997 Enterprise Budgets, Winter Wheat-Dry Pea Rotation, Columbia County, Washington State, EB 1617, Cooperative Extension, WSU, July 1997.