2015 Costs and Returns Estimate

Eastern Idaho: Higher Rainfall Dryland Hard White Spring Wheat

Paul E. Patterson



Background and Assumptions

The University of Idaho's costs and returns estimates are based on economic costs, not accounting costs. All resources are valued at a market rate or "opportunity cost". Input prices are taken from the U of I's annual survey of agricultural supply companies. The selling price is a historical average, not a current year's price. The cost estimate shown here is representative of growing dryland spring wheat in the higher rainfall areas of eastern Idaho, typically greater than 15 inches annually. Production practices are based on data from farmers, crop consultants, and extension personnel in eastern Idaho. Production practices most closely represent those in Caribou, Fremont, Madison, and Bonneville counties. Although production practices may be similar for individual farms, each farm has a unique set of resources with different levels of productivity, different production problems, and therefore different costs. Farm size, crop rotation, age and type of equipment, and the quality and intensity of management are all crucial factors that influence production costs.

The Model Farm

The model farm for this costs and returns estimate is a 2,500-acre dryland farm following a typical continuous cropping rotation that includes spring barley and spring wheat. The rotation can vary by field and moisture availability. The assumed acreage for the enterprise budgets includes 1,000 acres planted to spring wheat and 1,500 acres planted to spring malting barley.

Production Practices

The field is disked in the fall just after the previous grain crop is harvested. The ground is also sprayed with glyphosate in the fall to control weeds and volunteer grain. Most fertilizer is custom applied in the spring and incorporated with a field cultivator prior to planting. In April wheat is planted and a starter fertilizer is applied using an air-seeder drill. A two-way tank mix herbicide to control broadleaf weeds and wild oats is ground applied is in late May or early June. No post-planting insecticides or fungicides are included because treatment is infrequent and unpredictable. Wheat is harvested by the farm operator in August and hauled to an elevator and sold. Storage costs are not included.

Machinery

Equipment used to produce spring grain is shown in Tables 4 and 5. Table 4 lists the equipment and their hourly operating and ownership costs, while Table 5 lists the equipment and their annual ownership costs. Machinery ownership cost (capital recovery) is based on 75% of the replacement cost of a new piece of equipment, except for trucks. Field truck prices are for a used vehicle with a new bed. Capital recovery combines depreciation and interest into a single value. To keep machinery prices current between years in which a comprehensive survey is conducted, machinery prices are adjusted using USDA's Farm Machinery Prices Paid Index. Equipment prices are collected approximately every five years.

The University of Idaho uses the budget generator program *Budget Planner* from the University of California-Davis to produce the various tables shown in this publication. Machinery operating and ownership costs are calculated based on engineering equations in this program. Machinery operating costs include fuel, lubricants and repairs.

Labor and Management

The cost of labor used in this study includes a base wage, plus a percentage to account for various payroll taxes (FICA, SUTA & FUTA), and workman's compensation, as well as benefits such as paid vacation/personal leave days, health insurance and bonuses. Labor is classified by the type of work performed. Labor classifications, labor rates and payroll overhead are shown below.

Labor Values

Labor	Base	Payroll	Effective
Class	Rate	Overhead	Rate
General Farm Labor	\$9.25	15%	\$10.65
Truck Drivers	\$12.50	15%	\$14.40
Equipment Operators	\$14.80	25%	\$18.50

Based on the speed, width and overall field efficiency, *Budget Planner* calculates equipment operator labor hours for all field operations except those performed on a custom basis.

Custom operations are listed separately. General farm labor accounts for extra field labor used during planting or harvest. A management fee based on approximately 5% of the total production costs is included. Prior to 2013, the basis of the 5% charge was expected revenue.

Capital, Land and Overhead Costs

Interest on operating capital is charged from the time an input is applied until harvest and is calculated at a nominal rate of 5.75 percent. Interest on intermediate term capital, primarily equipment, is calculated using a nominal rate of 5.5 percent. A general overhead charge, calculated at approximately 2.5 percent of operating expenses, is included to cover unallocated whole-farm costs such as office expenses, legal and accounting fees, cell phones, internet service and utilities. Irrigation power is not included as part of general farm utilities.

Land rent is based on a one-year cash lease for grain.

Budget Format

In addition to the Background and Assumption pages, this publication has six tables presenting a variety of cost and returns information.

<u>Table 1</u> shows both expected revenue, based on a specified yield and price, and expenses. Expenses are broken into two main categories: operating and ownership. Operating expenses are those that typically vary with the level of production and involve inputs that are used in a single production cycle. Ownership expenses include a systematic cost recovery over the useful life for inputs used in the production process that have a useful life of more than one year. Machinery and land fall into this category. Operating inputs are organized by category. In addition to the cost per unit and cost per acre for each input, a total cost is given for each category. Table 1 also gives a total of all operating, ownership and total costs per acre, as well as these same categories on a yield basis (per bushel, cwt, ton, etc.).

<u>Table 2</u> has most of the same cost information presented in Table 1 but the data is organized by operation for both preharvest and harvest costs. Operations can define a single activity, such as seed hauling, or multiple activities as in the case of tillage. The quantity of labor is shown for each operation. The cash costs per acre for labor, machinery costs, materials and custom are also specified. Cash overhead expenses are listed separately as are the non-cash overhead. <u>Table 3</u> is a monthly cash flow of expenses based on when the operation occurs and when inputs are applied. Field operations are classified as pre-harvest, harvest and postharvest.

<u>Table 4</u> lists the equipment used to produce this crop and the costs per hour to operate this equipment. Total annual hours of use for the current crop and for all crops on the farm is also shown.

<u>Table 5</u> lists the purchase price and salvage value of equipment used to produce this crop, as well annual capital recovery and cash overhead expenses.

<u>Table 6</u> provides a ranging analysis, sometime referred to as a sensitivity analysis. Table 6 shows how the costs and returns per acre will vary as the yield and/or price ranges above and below the base values from Table 1.

Authors

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Disclaimer

The practices and chemicals specified in the publication are not recommendations. Always read and follow the directions printed on the pesticide label. Due to constantly changing pesticide laws and labels, some pesticides may have been cancelled or had certain uses prohibited. The use of trade names for various products simplifies presentation of this material and should not be considered an endorsement, nor is any criticism implied of similar products not mentioned.

EASTERN IDAHO DRYLAND

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TABLE 1. COSTS AND RETURNS PER ACRE TO PRODUCE HARD WHITE WHEAT

	Quantity/		Price or	Value or	Your
	Acre	Unit	Cost/Unit	Cost/Acre	Cost
GROSS RETURNS					
Hard White Wheat	50.00	bu	5.75	287.50	
TOTAL GROSS RETURNS	50.00	bu		287.50	
OPERATING COSTS					
Seed:				17.50	
Wheat Seed: HWS	70.00	lb	0.25	17.50	
Fertilizer:				69.03	
Dry Nitrogen - Pre-plant	84.00	lb	0.55	46.20	
Sulfur	15.00	lb	0.27	4.05	
Liquid Nitrogen	6.00	lb	0.73	4.38	
Liquid P2O5	20.00	lb	0.72	14.40	
Pesticides/Chemicals:				29.64	
Roundup Power Max 4.5	16.00	fl oz	0.21	3.36	
Ammonium Sulfate	3.00	lb	0.60	1.80	
Bronate Advanced	1.20	pint	5.50	6.60	
Axial XL	16.40	fl oz	1.09	17.88	
Custom:				16.25	
Custom Fertilize: 0 - 400 lbs	1.00	acre	7.25	7.25	
Custom Haul: wheat	50.00	bu	0.18	9.00	
Other:				8.00	
Crop Insurance	1.00	acre	8.00	8.00	
Labor				17.59	
Equipment Operator Labor	0.79	hrs	18.50	14.56	
General Farm Labor	0.28	hrs	10.65	3.03	
Machinery				25.69	
Fuel-Gas	0.83	gal	2.50	2.08	
Fuel-Diesel	4.19	gal	2.35	9.84	
Fuel-Road Diesel	0.13	gal	2.85	0.38	
Lube				1.85	
Machinery Repair				11.54	
Interest on Operating Capital @ 5.75%				5.18	
TOTAL OPERATING COSTS/ACRE				188.87	
TOTAL OPERATING COSTS/BU				3.78	
NET RETURNS ABOVE OPERATING COSTS				98.63	

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TABLE 1. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
General Overhead				4.75	
Land Rent				70.00	
Management Fee				15.00	
Property Taxes				0.00	
Property Insurance				1.30	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				91.05	
TOTAL CASH OVERHEAD COSTS/BU				1.82	
TOTAL CASH COSTS/ACRE				279.92	
TOTAL CASH COSTS/BU				5.60	
NET RETURNS ABOVE CASH COSTS				7.58	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				44.51	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				44.51	
TOTAL NON-CASH OVERHEAD COSTS/BU				0.89	
TOTAL COST/ACRE				324.43	
TOTAL COST/BU				6.49	
NET RETURNS ABOVE TOTAL COST				-37.43	

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TABLE 2. COSTS PER ACRE TO PRODUCE HARD WHITE WHEAT

	Operation			Cash an	d Labor Cos	ts per Acre		
	Time	Labor	Fuel	Lube	Material	Custom/	Total	Your
Operation	(Hrs/A)	Cost		&Repairs	Cost	Rent	Cost	Cost
Preharvest:								
Tillage	0.10	3.63	3.97	2.35	0.00	0.00	9.94	
Ground Spray	0.04	1.27	0.67	0.48	5.16	0.00	7.58	
Crop Insurance	0.00	0.00	0.00	0.00	8.00	0.00	8.00	
Fertilizer Application	0.00	0.00	0.00	0.00	50.25	7.25	57.50	
Seed Hauling	0.01	0.22	0.09	0.09	0.00	0.00	0.41	
Plant	0.06	2.14	1.99	4.60	36.28	0.00	45.01	
Applying Herbicides	0.04	1.27	0.67	0.48	24.48	0.00	26.90	
Pickup Use	0.25	5.55	2.08	0.82	0.00	0.00	8.45	
Service Truck	0.06	1.33	0.29	0.06	0.00	0.00	1.67	
TOTAL PREHARVEST COSTS	0.56	15.41	9.76	8.88	124.17	7.25	165.46	
Harvest:								
Harvest	0.10	2.18	2.54	4.51	0.00	9.00	18.23	
TOTAL HARVEST COSTS	0.10	2.18	2.54	4.51	0.00	9.00	18.23	
Interest on Operating Capital at 5.75%							5.18	
TOTAL OPERATING COSTS/ACRE	0.66	17.59	12.30	13.39	124.17	16.25	188.87	

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TABLE 2. CONTINUED

	Operation _			Cash an	d Labor Cos	ts per Acre		
	Time	Labor	Fuel	Lube	Material	Custom/	Total	Your
Operation	(Hrs/A)	Cost		&Repairs	Cost	Rent	Cost	Cost
CASH OVERHEAD:								
General Overhead							4.75	
Land Rent							70.00	
Management Fee							15.00	
Property Taxes							0.00	
Property Insurance							1.30	
Investment Repairs							0.00	
TOTAL CASH OVERHEAD COSTS/ACRE							91.05	
TOTAL CASH COSTS/ACRE							279.92	
NON-CASH OVERHEAD:		Per Producing		Annual	Cost			
		Acre		Capital Re	ecovery			
Equipment		452.36	_	44.51			44.51	
TOTAL NON-CASH OVERHEAD COSTS		452.36		44.51			44.51	
TOTAL COSTS/ACRE							324.43	

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TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE HARD WHITE WHEAT

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Total
	14	14	14	14	15	15	15	15	15	15	15	15	15	
Preharvest:	5.00							4.10						0.04
Tillage	5.82	7.58						4.12						9.94 7.58
Ground Spray		7.38						8.00						8.00
Crop Insurance Fertilizer Application								8.00 57.50						57.50
Seed Hauling								0.41						0.41
Plant								45.01						45.01
Applying Herbicides								45.01	26.90					26.90
Pickup Use	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	8.45
Service Truck	0.03	0.03	0.03	0.03	0.13	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.13	1.67
TOTAL PREHARVEST COSTS	6.60	8.36	0.78	0.78	0.78	0.78	0.78	115.81	27.68	0.78	0.78	0.78	0.78	165.46
Harvest:														
Harvest													18.23	18.23
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.23	18.23
Interest on Operating Capital @5.75%	0.03	0.07	0.08	0.08	0.08	0.09	0.09	0.65	0.78	0.78	0.79	0.79	0.88	5.18
TOTAL OPERATING COSTS/ACRE	6.63	8.43	0.85	0.86	0.86	0.87	0.87	116.46	28.46	1.56	1.56	1.57	19.89	188.87
CASH OVERHEAD														
General Overhead	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	4.75
Land Rent							70.00							70.00
Management Fee	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	15.00
Property Taxes														0.00
Property Insurance								1.30						1.30
Investment Repairs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CASH OVERHEAD COSTS	1.52	1.52	1.52	1.52	1.52	1.52	71.52	2.82	1.52	1.52	1.52	1.52	1.52	91.05
TOTAL CASH COSTS/ACRE	8.15	9.95	2.37	2.38	2.38	2.38	72.39	119.28	29.98	3.08	3.08	3.09	21.41	279.92

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TABLE 4. HOURLY EQUIPMENT COSTS

		Hard White Wheat	Total		Cash O	verhead		Operating		_
		Hours	Hours	Capital	Insur-		Lube&		Total	Total
Yr	Description	Used	Used	Recovery	ance	Taxes	Repairs	Fuel	Oper.	Costs/Hr.
15	Truck 10-Wheeler	10	75	65.92	2.40	0.00	8.82	9.49	18.31	86.63
15	Service Truck	60	150	24.76	0.78	0.00	0.94	4.76	5.70	31.24
15	Sprayer - 50' 1,000 gallon Tank	73	185	14.41	0.33	0.00	8.88	0.00	8.88	23.62
15	Tandem Disk - 26'	62	155	29.98	0.79	0.00	11.01	0.00	11.01	41.79
15	F. Cultivator -36'	41	125	39.82	1.14	0.00	16.90	0.00	16.90	57.86
15	Tractor 300 HP WT	114	300	57.60	2.03	0.00	8.43	34.78	43.21	102.84
15	Tractor 145 HP - Used	80	200	27.00	0.95	0.00	4.08	16.83	20.91	48.86
15	Tractor 255 HP Rubber Track	67	200	82.01	3.05	0.00	7.08	29.56	36.64	121.70
15	Air Seeder Grain Drill 35'	61	165	113.48	2.70	0.00	67.25	0.00	67.25	183.43
15	Pickup 2 - 3/4 ton	100	250	15.37	0.44	0.00	3.28	8.32	11.60	27.41
15	Pickup 1 - 3/4 ton	150	375	11.19	0.31	0.00	3.28	8.32	11.60	23.10
15	SP Combine: 30' Dryland	108	300	123.92	3.12	0.00	41.77	23.50	65.27	192.31

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TABLE 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

ANNUAL EQUIPMENT COSTS

						Cash Ove	rhead		
			Yrs	Salvage	Capital	Insur-			
Yr	Description	Price	Life	Value	Recovery	ance	Taxes	Total	
15	Truck 10-Wheeler	75,000.00	25	5,000.00	5,493.45	200.00	0.00	5,693.45	
15	Service Truck	50,000.00	20	2,000.00	4,126.61	130.00	0.00	4,256.61	
15	Sprayer - 50' 1,000 gallon Tank	22,000.00	8	4,967.30	2,962.05	67.42	0.00	3,029.47	
15	Tandem Disk - 26'	48,000.00	12	6,648.32	5,163.66	136.62	0.00	5,300.28	
15	F. Cultivator -36'	58,000.00	15	5,568.37	5,529.79	158.92	0.00	5,688.71	
15	Tractor 300 HP WT	240,000.00	20	30,794.76	19,199.87	676.99	0.00	19,876.85	
15	Tractor 145 HP - Used	75,000.00	20	9,623.36	5,999.96	211.56	0.00	6,211.52	
15	Tractor 255 HP Rubber Track	250,000.00	25	21,141.94	18,224.03	677.85	0.00	18,901.88	
15	Air Seeder Grain Drill 35'	165,000.00	9	32,970.43	20,804.44	494.93	0.00	21,299.36	
15	Pickup 2 - 3/4 ton	41,000.00	12	8,000.00	4,268.96	122.50	0.00	4,391.46	
15	Pickup 1 - 3/4 ton	41,000.00	10	10,000.00	4,662.70	127.50	0.00	4,790.20	
15	SP Combine: 30' Dryland	350,000.00	10	66,020.78	41,306.03	1,040.05	0.00	42,346.08	
	TOTAL	1,415,000.00	-	202,735.26	137,741.55	4,044.34	0.00	141,785.89	
	90% of New Cost*	1,273,500.00	-	182,461.74	123,967.40	3,639.90	0.00	127,607.30	

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					Cash Ov	erhead			
		Yrs	Salvage	Capital	Insur-				
Description	Price	Life	Value	Recovery	ance	Taxes	Repairs	Total	
INVESTMENT									
TOTAL INVESTMENT	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	

ANNUAL BUSINESS OVERHEAD COSTS

	Units/		Price/	Total
Description	Farm	Unit	Unit	Cost
General Overhead	1000	acre	4.75	4,750.00
Land Rent	1000	acre	70.00	70,000.00
Management Fee	1000	acre	15.00	15,000.00

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TABLE 6. RANGING ANALYSIS - HARD WHITE WHEAT

COSTS PER ACRE AND PER BU AT VARYING YIELDS TO PRODUCE HARD WHITE WHEAT

-			YI	ELD(BU)			
	44.00	46.00	48.00	50.00	52.00	54.00	56.00
OPERATING COSTS/ACRE:							
Preharvest	165.46	165.46	165.46	165.46	165.46	165.46	165.46
Harvest	18.23	18.23	18.23	18.23	18.23	18.23	18.23
Interest on Operating Capital @ 5.75%	5.18	5.18	5.18	5.18	5.18	5.18	5.18
TOTAL OPERATING COSTS/ACRE	188.87	188.87	188.87	188.87	188.87	188.87	188.87
TOTAL OPERATING COSTS/BU	4.29	4.11	3.93	3.78	3.63	3.50	3.37
CASH OVERHEAD COSTS/ACRE	91.05	91.05	91.05	91.05	91.05	91.05	91.05
TOTAL CASH COSTS/ACRE	279.92	279.92	279.92	279.92	279.92	279.92	279.92
TOTAL CASH COSTS/BU	6.36	6.09	5.83	5.60	5.38	5.18	5.00
NON-CASH OVERHEAD COSTS/ACRE	44.51	44.51	44.51	44.51	44.51	44.51	44.51
TOTAL COSTS/ACRE	324.43	324.43	324.43	324.43	324.43	324.43	324.43
TOTAL COSTS/BU	7.37	7.05	6.76	6.49	6.24	6.01	5.79

Net Return Per Acre Above Operating Costs For Hard White Wheat

PRICE (\$/bu)			YIE	LD (bu/acre)			
Hard White Wheat	44.00	46.00	48.00	50.00	52.00	54.00	56.00
5.00	31.13	41.13	51.13	61.13	71.13	81.13	91.13
5.25	42.13	52.63	63.13	73.63	84.13	94.63	105.13
5.50	53.13	64.13	75.13	86.13	97.13	108.13	119.13
5.75	64.13	75.63	87.13	98.63	110.13	121.63	133.13
6.00	75.13	87.13	99.13	111.13	123.13	135.13	147.13
6.25	86.13	98.63	111.13	123.63	136.13	148.63	161.13
6.50	97.13	110.13	123.13	136.13	149.13	162.13	175.13

Net Return Per Acre Above Cash Costs For Hard White Wheat

PRICE (\$/bu)	YIELD (bu/acre)								
Hard White Wheat	44.00	46.00	48.00	50.00	52.00	54.00	56.00		
5.00	-59.92	-49.92	-39.92	-29.92	-19.92	-9.92	0.08		
5.25	-48.92	-38.42	-27.92	-17.42	-6.92	3.58	14.08		
5.50	-37.92	-26.92	-15.92	-4.92	6.08	17.08	28.08		
5.75	-26.92	-15.42	-3.92	7.58	19.08	30.58	42.08		
6.00	-15.92	-3.92	8.08	20.08	32.08	44.08	56.08		
6.25	-4.92	7.58	20.08	32.58	45.08	57.58	70.08		
6.50	6.08	19.08	32.08	45.08	58.08	71.08	84.08		

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TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Hard White Wheat

PRICE (\$/bu)	YIELD (bu/acre)									
Hard White Wheat	44.00	46.00	48.00	50.00	52.00	54.00	56.00			
5.00	-104.43	-94.43	-84.43	-74.43	-64.43	-54.43	-44.43			
5.25	-93.43	-82.93	-72.43	-61.93	-51.43	-40.93	-30.43			
5.50	-82.43	-71.43	-60.43	-49.43	-38.43	-27.43	-16.43			
5.75	-71.43	-59.93	-48.43	-36.93	-25.43	-13.93	-2.43			
6.00	-60.43	-48.43	-36.43	-24.43	-12.43	-0.43	11.57			
6.25	-49.43	-36.93	-24.43	-11.93	0.57	13.07	25.57			
6.50	-38.43	-25.43	-12.43	0.57	13.57	26.57	39.57			