



Southwest Idaho: Treasure valley Commercial Dry Beans

Kathleen Painter

Southwestern Idaho

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 an historical average, not a current year's price. The cost estimate shown here is typical for producing alfalfa in northern Idaho. Production practices most closely resemble those in Canyon County. 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 costs.

The Model Farm

This costs and returns estimate models a 1,200-acre farm with 150 acres in dry beans, 150 acres in alfalfa seed or alfalfa hay, 300 acres in potatoes or sugarbeets, 300 acres in grain, and 300 acres in corn. The farm uses a concrete ditch and siphon tube irrigation system with water delivered to the farm from an irrigation district. The district charges a flat fee per acre for water.

Production Practices

After harvest of the previous crop, the ground is plowed and harrowed in the fall. In the spring, beds are established so the field can be irrigated prior to planting. The field is planted in May. The field is cultivated twice during the season for weed control. Fertilizer is custom applied in the spring before spring tillage operations. A pre-emergence tank-mix herbicide is custom applied and incorporated before planting. Beans are harvested and hauled by a custom operator. In September, the beans are cut and left in windrows to dry for approximately 2 weeks before combining. Beans are

then hauled to the warehouse in bulk to be milled, stored, and eventually sold through the warehouse.

Beans receive about 24 inches of water from eight irrigations, including the pre-plant irrigation: 3 inches in April before planting, 9 inches in June, 9 inches in July, and 3 inches in August.

Resources: Machinery, Land, Labor, and Capital

Table 4 lists hourly equipment costs for the tractors, trucks, and other farm equipment, along with total annual hours of use for this crop and for all crops in the model farm. Except for trucks, machinery is valued at 75 percent of new replacement cost. In the years between equipment price surveys, which are done approximately every five years, machinery prices are adjusted using USDA's Farm Machinery Prices Paid Index. Machinery cost assumptions are listed in Table 5, and include purchase price, salvage value, annual capital recovery costs, and cash overhead costs.

Land rent for dry bean production is estimated to be \$250 per acre. The cost of the irrigation system is included in the rent.

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.

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 Class	Base Rate	Payroll Overhead	Effective Rate
General Farm Labor	\$8.90	15%	\$10.25
Truck Drivers	\$12.00	15%	\$13.80
Equipment Operators	\$14.25	25%	\$17.80

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 is charged based on approximately 5% of total production costs.

Capital 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 rate of 6.0 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.

Sensitivity Analysis

Impacts of changes in crop price and yield assumptions on net returns, known as sensitivity or ranging analysis, can be found in Table 6.

Author: Kathleen Painter is an Extension Ag Economist at the University of Idaho, Moscow. She can be contacted at kpainter@uidaho.edu or (208) 885-6041.

Disclaimer

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TABLE 1. COSTS AND RETURNS PER ACRE TO PRODUCE COMMERCIAL DRY BEANS

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Dry Beans	24.00	cwt	38.00	912.00	
TOTAL GROSS RETURNS	24.00	cwt		912.00	
OPERATING COSTS					
Seed:				55.80	
Dry Bean Seed - Pinto	90.00	lb	0.62	55.80	
Fertilizer:				60.65	
Dry Nitrogen	20.00	lb	0.66	13.20	
Dry P2O5	40.00	lb	0.53	21.20	
K2O	25.00	lb	0.50	12.50	
Zinc	5.00	lb	2.75	13.75	
Pesticide:				29.65	
Sonalan HFP	2.00	pint	5.70	11.40	
Dual II Magnum 7.64EC	1.00	pint	18.25	18.25	
Custom:				93.60	
Custom Fertilize: 0 - 400 lbs	1.00	acre	8.00	8.00	
Custom Cut/Windrow Dry Beans	1.00	acre	34.00	34.00	
Custom Combine Dry Beans	24.00	cwt	1.85	44.40	
Custom Haul - cwt	24.00	bu	0.30	7.20	
Irrigation:				51.60	
Water Assessment	1.00	acre	48.85	48.85	
Irrig. Repairs - Concrete Ditch	1.00	acre	2.75	2.75	
Other:				21.25	
Crop Insurance	1.00	acre	21.25	21.25	
Storage:				24.00	
Storage & Cleaning	24.00	cwt	1.00	24.00	
Labor				88.68	
Equipment Operator Labor	2.52	hrs	17.80	44.89	
Irrigation Labor	3.15	hrs	12.60	39.69	
General Farm Labor	0.40	hrs	10.25	4.10	
Machinery				61.12	
Fuel-Gas	1.28	gal	3.70	4.74	
Fuel-Diesel	10.69	gal	3.60	38.47	
Fuel-Road Diesel	0.08	gal	4.10	0.31	
Lube				6.53	
Machinery Repair				11.07	
Interest on Operating Capital @ 5.75%				11.14	
TOTAL OPERATING COSTS/ACRE				497.48	
TOTAL OPERATING COSTS/CWT				20.73	
NET RETURNS ABOVE OPERATING COSTS				414.52	

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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				24.00	
Land Rent				225.00	
Management Fee				32.00	
Property Taxes				0.00	
Property Insurance				1.49	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				282.49	
TOTAL CASH OVERHEAD COSTS/CWT				11.77	
TOTAL CASH COSTS/ACRE				779.98	
TOTAL CASH COSTS/CWT				32.50	
NET RETURNS ABOVE CASH COSTS				132.02	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				51.12	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				51.12	
TOTAL NON-CASH OVERHEAD COSTS/CWT				2.13	
TOTAL COST/ACRE				831.09	
TOTAL COST/CWT				34.63	
NET RETURNS ABOVE TOTAL COST				80.91	

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TABLE 2. COSTS PER ACRE TO PRODUCE COMMERCIAL DRY BEANS

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent		
Preharvest:								
Plow	0.36	7.68	10.20	4.64	0.00	0.00	22.52	
Harrow	0.13	2.75	3.14	1.02	0.00	0.00	6.91	
Plane	0.12	2.59	3.44	1.34	0.00	0.00	7.38	
Irrigation Water Assessment	0.00	0.00	0.00	0.00	48.85	0.00	48.85	
Irrigation Repairs	0.00	0.00	0.00	0.00	2.75	0.00	2.75	
Crop Insurance	0.00	0.00	0.00	0.00	21.25	0.00	21.25	
Fertilize	0.00	0.00	0.00	0.00	60.65	8.00	68.65	
Ground Spray & Incorporate	0.13	2.75	3.14	1.16	29.65	0.00	36.70	
Bed Up	0.14	2.94	3.36	1.00	0.00	0.00	7.30	
Irrigate	3.15	39.69	0.00	0.00	0.00	0.00	39.69	
Knock Down Beds	0.13	2.75	3.14	1.02	0.00	0.00	6.91	
Seed Hauling	0.13	2.67	0.31	0.54	0.00	0.00	3.52	
Plant	0.19	8.12	5.33	2.95	55.80	0.00	72.19	
Cultivate	0.28	5.88	6.71	2.44	0.00	0.00	15.03	
General Pickup Use	0.51	10.86	4.74	1.49	0.00	0.00	17.09	
TOTAL PREHARVEST COSTS	5.25	88.68	43.52	17.60	218.95	8.00	376.75	
Harvest:								
Cut and Windrow Beans	0.00	0.00	0.00	0.00	0.00	34.00	34.00	
Combine	0.00	0.00	0.00	0.00	0.00	44.40	44.40	
Crop Hauling	0.00	0.00	0.00	0.00	7.20	0.00	7.20	
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	7.20	78.40	85.60	
Storage:								
Storage	0.00	0.00	0.00	0.00	24.00	0.00	24.00	
TOTAL STORAGE COSTS	0.00	0.00	0.00	0.00	24.00	0.00	24.00	
Interest on Operating Capital at 5.75%							11.14	
TOTAL OPERATING COSTS/ACRE	5.25	88.68	43.52	17.60	250.15	86.40	497.48	

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TABLE 2. CONTINUED

Operation	Operation	Cash and Labor Costs per Acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel	Lube &Repairs	Material Cost	Custom/ Rent		
CASH OVERHEAD:								
General Overhead							24.00	
Land Rent							225.00	
Management Fee							32.00	
Property Taxes							0.00	
Property Insurance							1.49	
Investment Repairs							0.00	
TOTAL CASH OVERHEAD COSTS/ACRE							282.49	
TOTAL CASH COSTS/ACRE							779.98	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Equipment		506.51		51.12			51.12	
TOTAL NON-CASH OVERHEAD COSTS							51.12	
TOTAL COSTS/ACRE							831.09	

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TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE COMMERCIAL DRY BEANS

	OCT 12	NOV 12	DEC 12	JAN 13	FEB 13	MAR 13	APR 13	MAY 13	JUN 13	JUL 13	AUG 13	SEP 13	OCT 13	Total
Preharvest:														
Plow	22.52													22.52
Harrow	6.91													6.91
Plane	7.38													7.38
Irrigation Water Assessment							48.85							48.85
Irrigation Repairs							2.75							2.75
Crop Insurance							21.25							21.25
Fertilize							68.65							68.65
Ground Spray & Incorporate							36.70							36.70
Bed Up							7.30							7.30
Irrigate								4.41	13.23	13.23	8.82			39.69
Knock Down Beds								6.91						6.91
Seed Hauling								3.52						3.52
Plant								72.19						72.19
Cultivate									7.51	7.51				15.03
General Pickup Use	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	17.09
TOTAL PREHARVEST COSTS	38.13	1.31	1.31	1.31	1.31	1.31	186.82	88.35	22.06	22.06	10.13	1.31	1.31	376.75
Harvest:														
Cut and Windrow Beans													34.00	34.00
Combine													44.40	44.40
Crop Hauling													7.20	7.20
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	85.60	0.00	85.60
Storage:														
Storage														24.00
TOTAL STORAGE 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	24.00	24.00
Interest on Operating Capital @5.75%	0.18	0.19	0.20	0.20	0.21	0.22	1.11	1.54	1.64	1.75	1.80	2.22	-0.12	11.14
TOTAL OPERATING COSTS/ACRE	38.31	1.50	1.51	1.52	1.52	1.53	187.93	89.89	23.70	23.81	11.93	89.13	25.19	497.48
CASH OVERHEAD														
General Overhead	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	24.00
Land Rent														225.00
Management Fee	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	32.00
Property Taxes			0.00							0.00				0.00
Property Insurance							1.49							1.49
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	4.67	4.67	4.67	4.67	4.67	4.67	6.16	4.67	4.67	4.67	4.67	4.67	4.67	282.49
TOTAL CASH COSTS/ACRE	42.98	6.17	6.18	6.18	6.19	6.20	194.09	94.55	28.37	28.47	16.60	93.80	29.86	779.98

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TABLE 4. HOURLY EQUIPMENT COSTS

COMMERCIAL DRY BEANS		Total		Cash Overhead			Operating		Total	Total
Yr	Description	Hours Used	Hours Used	Capital Recovery	Insur- ance	Taxes	Lube& Repairs	Fuel	Oper.	Costs/Hr.
13	4-wheeler	20	120	4.91	0.13	0.00	0.68	1.22	1.90	6.94
13	Landplane - 16'	18	125	8.83	0.24	0.00	2.42	0.00	2.42	11.49
13	Moldboard Plow 4b	54	125	7.97	0.22	0.00	4.24	0.00	4.24	12.43
13	Pickup 1 - 3/4 ton	28	750	8.17	0.15	0.00	3.73	12.21	15.94	24.26
13	Pickup 2 - 3/4 ton	28	750	8.17	0.15	0.00	3.73	12.21	15.94	24.26
13	Tractor - 125hp	132	400	18.48	0.58	0.00	6.14	22.18	28.31	47.37
13	Tractor - 145hp	110	450	20.84	0.66	0.00	7.88	25.78	33.66	55.15
13	Triple-K - 16'	58	100	5.31	0.15	0.00	1.14	0.00	1.14	6.60
13	Corrugator/Bedder 8R, 22"	21	100	3.27	0.08	0.00	0.54	0.00	0.54	3.89
13	Cultivator - 8 Row, 22"	41	125	7.84	0.20	0.00	2.13	0.00	2.13	10.16
13	Planter - 8 Row, 22"	28	100	29.83	0.72	0.00	7.00	0.00	7.00	37.55
13	Sprayer - 20'	19	150	1.74	0.04	0.00	1.10	0.00	1.10	2.88
13	Truck 1-O&P 10-Wheeler	19	555	11.14	0.37	0.00	4.36	2.46	6.82	18.33

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

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
13	4-wheeler	6,000.00	10	1,500.00	701.41	18.75	0.00	720.16
13	Landplane - 16'	13,300.00	15	1,276.89	1,314.55	36.44	0.00	1,350.99
13	Moldboard Plow 4b	12,000.00	15	1,152.08	1,186.06	32.88	0.00	1,218.94
13	Pickup 1 - 3/4 ton	41,000.00	5	13,750.00	7,294.05	136.88	0.00	7,430.93
13	Pickup 2 - 3/4 ton	41,000.00	5	13,750.00	7,294.05	136.88	0.00	7,430.93
13	Tractor - 125hp	93,000.00	15	18,105.45	8,797.68	277.76	0.00	9,075.44
13	Tractor - 145hp	118,000.00	15	22,972.51	11,162.64	352.43	0.00	11,515.07
13	Triple-K - 16'	6,400.00	15	614.44	632.56	17.54	0.00	650.10
13	Corrugator/Bedder 8R, 22"	3,500.00	12	484.77	388.73	9.96	0.00	398.70
13	Cultivator - 8 Row, 22"	10,500.00	12	1,454.32	1,166.20	29.89	0.00	1,196.09
13	Planter - 8 Row, 22"	29,000.00	10	5,128.40	3,551.09	85.32	0.00	3,636.41
13	Sprayer - 20'	2,800.00	12	387.82	310.99	7.97	0.00	318.96
13	Truck 1-O&P 10-Wheeler	95,000.00	25	4,000.00	7,358.63	247.50	0.00	7,606.13
TOTAL		471,500.00	-	84,576.68	51,158.64	1,390.19	0.00	52,548.83
84% of New Cost*		396,060.00	-	71,044.41	42,973.26	1,167.76	0.00	44,141.02

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

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

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
General Overhead	150.00	acre	24	3,600.00
Land Rent	150.00	acre	225	33,750.00
Management Fee	150.00	acre	32	4,800.00

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TABLE 6. RANGING ANALYSIS - COMMERCIAL DRY BEANS
COSTS PER ACRE AND PER CWT AT VARYING YIELDS TO PRODUCE COMMERCIAL DRY BEANS

	YIELD(CWT)						
	17.70	19.80	21.90	24.00	26.10	28.20	30.30
OPERATING COSTS/ACRE:							
Preharvest	375.29	375.49	375.68	376.75	376.08	376.27	376.47
Harvest	73.95	77.83	81.72	85.60	89.49	93.37	97.26
Storage	24.00	24.00	24.00	24.00	24.00	24.00	24.00
Interest on Operating Capital @ 5.75%	11.08	11.10	11.12	11.14	11.15	11.17	11.19
TOTAL OPERATING COSTS/ACRE	484.32	488.42	492.52	497.48	500.72	504.81	508.91
TOTAL OPERATING COSTS/CWT	27.36	24.67	22.49	20.73	19.18	17.90	16.80
CASH OVERHEAD COSTS/ACRE							
TOTAL CASH COSTS/ACRE	766.81	770.91	775.01	779.98	783.21	787.31	791.41
TOTAL CASH COSTS/CWT	43.32	38.93	35.39	32.50	30.01	27.92	26.12
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL COSTS/ACRE	817.93	822.03	826.13	831.09	834.33	838.42	842.52
TOTAL COSTS/CWT	46.21	41.52	37.72	34.63	31.97	29.73	27.81

Net Return Per Acre Above Operating Costs For Commercial Dry Beans

PRICE (\$/cwt)	YIELD (cwt/acre)						
Dry Beans	17.70	19.80	21.90	24.00	26.10	28.20	30.30
29.00	28.98	85.78	142.58	198.52	256.18	312.99	369.79
32.00	82.08	145.18	208.28	270.52	334.48	397.59	460.69
35.00	135.18	204.58	273.98	342.52	412.78	482.19	551.59
38.00	188.28	263.98	339.68	414.52	491.08	566.79	642.49
41.00	241.38	323.38	405.38	486.52	569.38	651.39	733.39
44.00	294.48	382.78	471.08	558.52	647.68	735.99	824.29
47.00	347.58	442.18	536.78	630.52	725.98	820.59	915.19

Net Return Per Acre Above Cash Costs For Commercial Dry Beans

PRICE (\$/cwt)	YIELD (cwt/acre)						
Dry Beans	17.70	19.80	21.90	24.00	26.10	28.20	30.30
29.00	-253.51	-196.71	-139.91	-83.98	-26.31	30.49	87.29
32.00	-200.41	-137.31	-74.21	-11.98	51.99	115.09	178.19
35.00	-147.31	-77.91	-8.51	60.02	130.29	199.69	269.09
38.00	-94.21	-18.51	57.19	132.02	208.59	284.29	359.99
41.00	-41.11	40.89	122.89	204.02	286.89	368.89	450.89
44.00	11.99	100.29	188.59	276.02	365.19	453.49	541.79
47.00	65.09	159.69	254.29	348.02	443.49	538.09	632.69

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TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Commercial Dry Beans

PRICE (\$/cwt)	YIELD (cwt/acre)						
Dry Beans	17.70	19.80	21.90	24.00	26.10	28.20	30.30
29.00	-304.63	-247.83	-191.03	-135.09	-77.43	-20.62	36.18
32.00	-251.53	-188.43	-125.33	-63.09	0.87	63.98	127.08
35.00	-198.43	-129.03	-59.63	8.91	79.17	148.58	217.98
38.00	-145.33	-69.63	6.07	80.91	157.47	233.18	308.88
41.00	-92.23	-10.23	71.77	152.91	235.77	317.78	399.78
44.00	-39.13	49.17	137.47	224.91	314.07	402.38	490.68
47.00	13.97	108.57	203.17	296.91	392.37	486.98	581.58