



Southwestern Idaho

Southwest Idaho: Treasure Valley

Corn Silage: Roundup Ready

Kathleen Painter, Scott Jensen, Neil Rimbey and Paul 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 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, Payette and Owyhee 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 costs.

The Model Farm

This costs and returns estimate models a 1,200-acre farm with 300 acres in corn, 300 acres in potatoes or sugarbeets, 300 acres in grain, 150 acres in alfalfa seed or alfalfa hay, and 150 acres in dry beans. 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.

Tillage, Fertilization, Pest Control & Irrigation

After harvest of the previous crop, the ground is disc-ripped, roller harrowed and bedded in the fall. Prior to planting in the spring, the field receives a pre-plant irrigation before the beds are knocked down and a pre-emergence herbicide is applied and incorporated. The beds are re-established and the field is planted in 30-inch rows with a seeding rate of .48 bags per acre, or 38,000 seed kernels. An insecticide is also applied at planting. Corn is cultivated once for weed control and receives two applications of Roundup herbicide. In September, corn silage is custom chopped, hauled and packed in a nearby silage pit.

Fertilizer is custom applied in the fall, with additional nitrogen top-dressed in the spring after

planting. No costs are included for fungicides because their use is infrequent and unpredictable.

Corn silage receives about 30 inches of water during the growing season from ten irrigations: 3 inches in April before planting, 6 inches in June, 9 inches in July, 9 inches in August, and 3 inches in September.

Table 1 lists costs and returns by cost category (fertilizers, pesticides, machinery) for alfalfa production in southwestern Idaho. The cost for each operation can be found in Table 2. Costs by month can be found in Table 3.

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 corn silage 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

The practices and chemicals specified in this 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.

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TABLE 1. COSTS AND RETURNS PER ACRE TO PRODUCE ROUNDUP READY CORN SILAGE

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Corn Silage	32.00	ton	44.00	1,408.00	
TOTAL GROSS RETURNS	32.00	ton		1,408.00	
OPERATING COSTS					
Seed:				108.00	
Corn Seed - Roundup Ready	0.48	bag	225.00	108.00	
Fertilizer:				231.90	
Dry Nitrogen	200.00	lb	0.66	132.00	
Dry P2O5	80.00	lb	0.53	42.40	
K2O	100.00	lb	0.50	50.00	
Sulfur	30.00	lb	0.25	7.50	
Pesticide:				47.38	
Micro-Tech	2.00	qt	7.30	14.60	
Counter 15G L-N-L	8.00	lb	3.00	24.00	
Roundup Power Ma 4.5	40.00	fl oz	0.20	8.00	
AMS	2.00	lb	0.39	0.78	
Custom:				300.00	
Custom Chop, Haul & Pack	30.00	ton	10.00	300.00	
Irrigation:				51.60	
Water Assessment	1.00	acre	48.85	48.85	
Irrig. Repairs - Concrete Ditch	1.00	acre	2.75	2.75	
Custom and Consultants:				15.50	
Custom Fertilize	2.00	acre	7.75	15.50	
Labor				91.38	
Equipment Operator Labor	2.48	hrs	17.80	44.21	
Irrigation Labor	3.50	hrs	12.60	44.10	
General Farm Labor	0.30	hrs	10.25	3.08	
Machinery				62.32	
Fuel-Gas	1.27	gal	3.70	4.70	
Fuel-Diesel	10.55	gal	3.60	37.98	
Fuel-Road Diesel	0.08	gal	4.10	0.31	
Lube				6.45	
Machinery Repair				12.88	
Interest on Operating Capital @ 5.75%				20.89	
TOTAL OPERATING COSTS/ACRE				928.96	
TOTAL OPERATING COSTS/TON				29.03	
NET RETURNS ABOVE OPERATING COSTS				479.04	

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EBB2-CS-13

TABLE 1. CONTINUED

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
CASH OVERHEAD COSTS					
General Overhead				23.00	
Land Rent				250.00	
Management Fee				60.00	
Property Taxes				0.00	
Property Insurance				1.49	
Investment Repairs				0.00	
TOTAL CASH OVERHEAD COSTS/ACRE				334.49	
TOTAL CASH OVERHEAD COSTS/TON				10.45	
TOTAL CASH COSTS/ACRE				1,263.46	
TOTAL CASH COSTS/TON				39.48	
NET RETURNS ABOVE CASH COSTS				144.54	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Equipment				51.39	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				51.39	
TOTAL NON-CASH OVERHEAD COSTS/TON				1.61	
TOTAL COST/ACRE				1,314.85	
TOTAL COST/TON				41.09	
NET RETURNS ABOVE TOTAL COST				93.15	

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TABLE 2. COSTS PER ACRE TO PRODUCE ROUNDUP READY CORN SILAGE

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:								
Disk Ripper	0.17	3.54	6.48	4.88	0.00	0.00	14.91	
Fertilize	0.00	0.00	0.00	0.00	247.40	0.00	247.40	
Harrow	0.16	3.34	3.81	1.76	0.00	0.00	8.91	
Bed	0.28	5.88	7.80	2.63	0.00	0.00	16.30	
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	
Irrigate	3.50	44.10	0.00	0.00	0.00	0.00	44.10	
Spray & Incorporate	0.16	3.34	3.81	1.93	14.60	0.00	23.68	
Plane	0.12	2.59	2.96	1.11	0.00	0.00	6.67	
Seed Hauling	0.13	2.67	0.31	0.54	0.00	0.00	3.52	
Plant & Apply Insecticide	0.21	7.59	5.16	2.41	132.00	0.00	147.16	
Ground Spray	0.21	4.52	3.09	0.94	8.78	0.00	17.33	
Cultivate	0.17	3.67	4.87	1.65	0.00	0.00	10.19	
General Pickup Use	0.48	10.15	4.70	1.46	0.00	0.00	16.31	
TOTAL PREHARVEST COSTS	5.57	91.38	42.99	19.33	454.38	0.00	608.08	
Harvest:								
Harvest	0.00	0.00	0.00	0.00	0.00	300.00	300.00	
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	300.00	300.00	
Interest on Operating Capital at 5.75%							20.89	
TOTAL OPERATING COSTS/ACRE	5.57	91.38	42.99	19.33	454.38	300.00	928.96	

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EBB2-CS-13

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							23.00	
Land Rent							250.00	
Management Fee							60.00	
Property Taxes							0.00	
Property Insurance							1.49	
Investment Repairs							0.00	
TOTAL CASH OVERHEAD COSTS/ACRE							334.49	
TOTAL CASH COSTS/ACRE							1,263.46	
NON-CASH OVERHEAD:								
		Per Producing Acre		Annual Cost Capital Recovery				
Equipment		508.25		51.39			51.39	
TOTAL NON-CASH OVERHEAD COSTS							51.39	
TOTAL COSTS/ACRE							1,314.85	

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TABLE 4. HOURLY EQUIPMENT COSTS

Yr	Description	Roundup Ready Corn Silage	Total	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
		Hours Used	Hours Used	Capital Recovery	Insurance	Taxes	Lube& Repairs	Fuel		
13	4-wheeler	30	120	4.91	0.13	0.00	0.68	1.22	1.90	6.94
13	Cultivator - 6R CN	52	75	7.31	0.20	0.00	0.91	0.00	0.91	8.42
13	Disk-Ripper - 13'	50	175	26.45	0.64	0.00	15.74	0.00	15.74	42.83
13	Landplane - 16'	36	125	8.83	0.24	0.00	2.42	0.00	2.42	11.49
13	Pickup 1 - 3/4 ton	56	750	8.17	0.15	0.00	3.73	12.21	15.94	24.26
13	Pickup 2 - 3/4 ton	56	750	8.17	0.15	0.00	3.73	12.21	15.94	24.26
13	Planter - 6R CN	63	75	19.92	0.55	0.00	4.67	0.00	4.67	25.15
13	Roller Harrow -12'	94	150	13.53	0.35	0.00	4.52	0.00	4.52	18.39
13	Sprayer - 20'	110	150	1.74	0.04	0.00	1.10	0.00	1.10	2.88
13	Tractor - 125hp	213	400	18.48	0.58	0.00	6.14	22.18	28.31	47.37
13	Tractor - 145hp	147	450	20.84	0.66	0.00	7.88	25.78	33.66	55.15
13	Tractor - 200hp	55	600	20.79	0.66	0.00	12.45	35.53	47.98	69.43
13	Tractor - 75hp	70	300	12.45	0.39	0.00	3.05	13.26	16.31	29.16
13	Corrugator/Bedder 6R, 30"	83	150	2.18	0.06	0.00	0.88	0.00	0.88	3.11
13	Truck 1-O&P 10-Wheeler	38	555	11.14	0.37	0.00	4.36	2.46	6.82	18.33

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EBB2-CS-13

TABLE 3. MONTHLY COSTS PER ACRE TO PRODUCE ROUNDUP READY CORN SILAGE

	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:													
Disk Ripper	14.91												14.91
Fertilize	140.65						106.75						247.40
Harrow	8.91												8.91
Bed	8.15						8.15						16.30
Irrigation Water Assessment							48.85						48.85
Irrigation Repairs							2.75						2.75
Irrigate							4.41	8.82	13.23	13.23	4.41		44.10
Spray & Incorporate							23.68						23.68
Plane							6.67						6.67
Seed Hauling							3.52						3.52
Plant & Apply Insecticide							147.16						147.16
Ground Spray								17.33					17.33
Cultivate								10.19					10.19
General Pickup Use	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	1.36	16.31
TOTAL PREHARVEST COSTS	173.98	1.36	1.36	1.36	1.36	95.87	258.79	37.70	14.59	14.59	5.77	1.36	608.08
Harvest:													
Harvest											300.00		300.00
TOTAL HARVEST COSTS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	300.00	0.00	300.00
Interest on Operating Capital @5.75%	0.83	0.84	0.85	0.85	0.86	1.32	2.56	2.74	2.81	2.88	4.34	-0.01	20.88
TOTAL OPERATING COSTS/ACRE	174.81	2.20	2.21	2.21	2.22	97.19	261.35	40.44	17.40	17.47	310.11	1.35	928.96
CASH OVERHEAD													
General Overhead	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	23.00
Land Rent					250.00								250.00
Management Fee	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	60.00
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
TOTAL CASH OVERHEAD COSTS	6.92	6.92	6.92	6.92	256.92	8.41	6.92	6.92	6.92	6.92	6.92	6.92	334.49
TOTAL CASH COSTS/ACRE	181.73	9.12	9.12	9.13	259.14	105.60	268.27	47.35	24.32	24.39	317.03	8.27	1,263.45

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SOUTHWESTERN IDAHO

EBB2-CS-13

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	Cultivator - 6R CN	6,600.00	15	633.64	652.33	18.08	0.00	670.42
13	Disk-Ripper - 13'	45,000.00	10	7,957.86	5,510.31	132.39	0.00	5,642.71
13	Landplane - 16'	13,300.00	15	1,276.89	1,314.55	36.44	0.00	1,350.99
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	Planter - 6R CN	18,000.00	15	1,728.12	1,779.09	49.32	0.00	1,828.41
13	Roller Harrow -12'	21,750.00	12	3,012.52	2,415.70	61.91	0.00	2,477.61
13	Sprayer - 20'	2,800.00	12	387.82	310.99	7.97	0.00	318.96
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	Tractor - 200hp	157,000.00	15	30,565.12	14,851.99	468.91	0.00	15,320.90
13	Tractor - 75hp	47,000.00	15	9,150.07	4,446.14	140.38	0.00	4,586.51
13	Corrugator/Bedder 6R, 30"	3,500.00	12	484.77	388.73	9.96	0.00	398.70
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		708,950.00	-	129,274.76	74,278.29	2,095.56	0.00	76,373.85
84% of New Cost*		595,518.00	-	108,590.80	62,393.76	1,760.27	0.00	64,154.03

*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	300.00	acre	23	6,900.00
Land Rent	300.00	acre	250	75,000.00
Management Fee	300.00	acre	60	18,000.00

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SOUTHWESTERN IDAHO
EBB2-CS-13

TABLE 6. RANGING ANALYSIS - ROUNDUP READY CORN SILAGE
COSTS PER ACRE AND PER TON AT VARYING YIELDS TO PRODUCE ROUNDUP READY CORN SILAGE

	YIELD(TON)						
	23.00	26.00	29.00	32.00	35.00	38.00	41.00
OPERATING COSTS/ACRE:							
Preharvest	608.08	608.08	608.08	608.08	608.08	608.08	608.08
Harvest	300.00	300.00	300.00	300.00	300.00	300.00	300.00
Interest on Operating Capital @ 5.75%	20.89	20.89	20.89	20.89	20.89	20.89	20.89
TOTAL OPERATING COSTS/ACRE	928.96	928.96	928.96	928.96	928.96	928.96	928.96
TOTAL OPERATING COSTS/TON	40.39	35.73	32.03	29.03	26.54	24.45	22.66
CASH OVERHEAD COSTS/ACRE	334.49	334.49	334.49	334.49	334.49	334.49	334.49
TOTAL CASH COSTS/ACRE	1,263.46	1,263.46	1,263.46	1,263.46	1,263.46	1,263.46	1,263.46
TOTAL CASH COSTS/TON	54.93	48.59	43.57	39.48	36.10	33.25	30.82
NON-CASH OVERHEAD COSTS/ACRE	51.39	51.39	51.39	51.39	51.39	51.39	51.39
TOTAL COSTS/ACRE	1,314.85	1,314.85	1,314.85	1,314.85	1,314.85	1,314.85	1,314.85
TOTAL COSTS/TON	57.17	50.57	45.34	41.09	37.57	34.60	32.07

Net Return Per Acre Above Operating Costs For Roundup Ready Corn Silage

PRICE (\$/ton)	YIELD (ton/acre)						
Corn Silage	23.00	26.00	29.00	32.00	35.00	38.00	41.00
38.00	-54.96	59.04	173.04	287.04	401.04	515.04	629.04
40.00	-8.96	111.04	231.04	351.04	471.04	591.04	711.04
42.00	37.04	163.04	289.04	415.04	541.04	667.04	793.04
44.00	83.04	215.04	347.04	479.04	611.04	743.04	875.04
46.00	129.04	267.04	405.04	543.04	681.04	819.04	957.04
48.00	175.04	319.04	463.04	607.04	751.04	895.04	1,039.04
50.00	221.04	371.04	521.04	671.04	821.04	971.04	1,121.04

Net Return Per Acre Above Cash Costs For Roundup Ready Corn Silage

PRICE (\$/ton)	YIELD (ton/acre)						
Corn Silage	23.00	26.00	29.00	32.00	35.00	38.00	41.00
38.00	-389.46	-275.46	-161.46	-47.46	66.54	180.54	294.54
40.00	-343.46	-223.46	-103.46	16.54	136.54	256.54	376.54
42.00	-297.46	-171.46	-45.46	80.54	206.54	332.54	458.54
44.00	-251.46	-119.46	12.54	144.54	276.54	408.54	540.54
46.00	-205.46	-67.46	70.54	208.54	346.54	484.54	622.54
48.00	-159.46	-15.46	128.54	272.54	416.54	560.54	704.54
50.00	-113.46	36.54	186.54	336.54	486.54	636.54	786.54

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EBB2-CS-13

TABLE 6. RANGING ANALYSIS CONTINUED

Net Return Per Acre Above Total Costs For Roundup Ready Corn Silage

PRICE (\$/ton)	YIELD (ton/acre)						
Corn Silage	23.00	26.00	29.00	32.00	35.00	38.00	41.00
38.00	-440.85	-326.85	-212.85	-98.85	15.15	129.15	243.15
40.00	-394.85	-274.85	-154.85	-34.85	85.15	205.15	325.15
42.00	-348.85	-222.85	-96.85	29.15	155.15	281.15	407.15
44.00	-302.85	-170.85	-38.85	93.15	225.15	357.15	489.15
46.00	-256.85	-118.85	19.15	157.15	295.15	433.15	571.15
48.00	-210.85	-66.85	77.15	221.15	365.15	509.15	653.15
50.00	-164.85	-14.85	135.15	285.15	435.15	585.15	735.15