



Southwestern Idaho

Alfalfa Hay

Ben Eborn

Introduction to Costs & Returns Estimates

The University of Idaho Extension produces crop costs and returns estimates every other year. The overall goal of this project is to provide the Idaho agricultural industry with an unbiased and consistently calculated estimate of the cost of producing various crops and to track the change in production costs per acre and per unit over time.

The University of Idaho's costs and returns estimates are based on economic costs, not just 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. Production practices are based on data from growers, crop consultants, and extension personnel throughout Idaho. 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 cost of production estimates show the typical or representative production costs by region based on documented production practices. These production costs are not area averages, rather they are based on model farms for four areas of the state.

University of Idaho costs and returns estimates can be used as a management tool to help producers in three ways:

1. **Templates.** Excel spreadsheets have been created by the University of Idaho to make enterprise budgeting and record keeping an easy task. You can start by substituting our costs and returns estimates with your own numbers. You can also enter them in the "Your Cost" column.
2. **Marketing.** Estimating production costs on a per acre or per unit basis can help you calculate your farm's break-even prices. Knowing your break-even price to cover operating costs and total costs can help with contract negotiations and selling on the open market.
3. **Benchmarks.** The University of Idaho costs and returns estimates are based on a typical or model farm and are calculated annually using consistent methodology. You can use these estimates as benchmarks by comparing your own total costs or specific cost categories to our estimates. This is a good way to find strengths and weaknesses in your production practices.

It's important to remember, just because your production costs are similar to our estimates, that isn't necessarily a good thing. Our model farms are also typically unprofitable! Average producers usually don't make an economic profit (which includes opportunity costs and non-cash costs such as depreciation). Being profitable requires fine-tuned management and a competitive advantage that the average producer doesn't have.

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 typical for producing alfalfa in southwestern 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 150 acres in alfalfa hay production. In addition to alfalfa hay, the farm grows 300 acres of potatoes or sugarbeets, 150 acres of dry beans, 300 acres of grain, and 150 acres of alfalfa seed. Approximately 30 acres of alfalfa are established each year and kept in production 5 years. 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

Tillage costs are incurred only in the year hay is established and should be prorated along with other establishment costs over the alfalfa hay production years. This is approximately \$65-75 per acre assuming a 5-year life. Hay ground is corrugated once during the growing season and harvested four times. Hay is cut and custom baled in June, July, August and October, then custom stacked. A total of 7.5 tons per acre are produced: 2.9 tons on the first cutting, 1.75 tons on the second cutting, 1.65 tons on the third cutting, and 1.2 tons on the fourth cutting. Fertilizer is applied once in the spring by a custom applicator. The farm operator applies a herbicide in the spring before alfalfa breaks dormancy, and an insecticide in June. Alfalfa hay is irrigated a total of 14 times: once

in April, twice in May, twice in June, three times in July, three times in August, twice in September and once in October.

Table 1 lists costs and returns by cost category (fertilizers, pesticides, machinery) for alfalfa production in southwestern Idaho.

Resources: Machinery, Land, Labor & Capital

Machinery ownership cost (capital recovery) is based on 75% of the replacement cost of a new piece of equipment, except for trucks. Capital recovery combines depreciation and interest into a single value. Equipment capital recovery (depreciation and interest) is calculated as a cost per acre. This non-cash overhead is shown in the lower part of Table 1. 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.

Land rent for alfalfa production is estimated to be \$225 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	\$14.00	15%	\$17.55
Truck Drivers	\$14.00	15%	\$17.55
Equipment Operators	\$18.00	25%	\$22.50
Irrigation Labor			
Set Move: HL & WL	\$14.00	30%	\$17.55
Continuous Move: CP & L	\$18.00	25%	\$22.50

Set Move includes: handlines and wheellines

Continuous Move includes: center pivots and linear move

Payroll overhead for set move systems includes housing

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 7.00 percent. Interest on intermediate term capital, primarily equipment, is calculated using a rate of 6.75 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 at the bottom of the table.

University of Idaho costs and returns estimates for both crops and livestock can be found at:
<https://www.uidaho.edu/cals/idaho-agbiz>

Author

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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.



Alfalfa Hay - Treasure Valley - 2019

Number of acres: 150

Item	Quantity Per Acre	Unit	Price or Cost	Total Value	Value or Cost/Acre
Gross Returns					
Alfalfa Hay	7.50	ton	160.00	180,000	\$1,200.00
				0	\$0.00
				0	\$0.00
Total Gross Returns				\$180,000	\$1,200.00
Operating Inputs					
Fertilizer:				\$10,598	\$70.65
Dry Nitrogen	15.00	lb	0.42	945	6.30
Dry P2O5	75.00	lb	0.41	4,613	30.75
K2O	80.00	lb	0.31	3,720	24.80
Sulfur	40.00	lb	0.22	1,320	8.80
				0	0.00
				0	0.00
				0	0.00
Pesticides:				\$3,188	\$21.25
Metribuzin 75DF	1.00	lb	16.00	2,400	16.00
Warrior II w/Zeon Tech	3.00	fl oz	1.75	788	5.25
				0	0.00
				0	0.00
				0	0.00
				0	0.00
Custom & Consultants:				\$45,000	\$300.00
Custom Fertilize	1.00	acre	7.50	1,125	7.50
Custom Swath & Rake	4.00	acre	30.00	18,000	120.00
Custom Bale: 1-ton	7.50	ton	18.00	20,250	135.00
Custom Haul & Stack: 1-ton	7.50	ton	5.00	5,625	37.50
				0	0.00
Irrigation:				\$9,150	\$61.00
Water Assessment	1.00	acre	57.00	8,550	57.00
Repairs - Conc. Ditch	1.00	acre	4.00	600	4.00
				0	0.00
Machinery:				\$2,284	\$15.23
Fuel - Gas	1.28	gal	3.25	624	4.16
Fuel - Diesel	1.65	gal	3.00	743	4.95
Fuel - Road Diesel	0.63	gal	3.50	331	2.21
Lube	1.00	\$	1.51	227	1.51
Machinery Repair	1.00	\$	2.40	360	2.40
Labor:				\$16,949	\$113.00
Equipment Operator Labor	1.20	hrs	22.50	4,050	27.00
Irrigation Labor	4.90	hrs	17.55	12,899	86.00
				0	0.00
Interest on Operating Capital at 7.00%				\$2,052	\$13.68
Total Operating Costs				\$89,220	\$594.80
Operating Costs per Unit				\$11,896	\$79.31
Net Returns Above Operating Costs				\$90,780	\$605.20

Alfalfa Hay - Treasure Valley - 2019

Number of acres: 150

General Overhead	2,250	15.00
Land Rent	33,750	225.00
Management Fee	7,050	47.00
Property Taxes	0	
Property Insurance	221	1.47
Investment Repairs	0	
Capital Recovery - Equipment	3,501	23.34
Alfalfa Establishment - Est. Amort. Cost	11,009	73.39
Total Ownership Costs	\$57,780	\$385.20
Ownership Costs per Unit	\$7,704	\$51.36
Total Costs per Acre	\$147,000	\$980.00
Total Cost per Unit	\$19,600	\$130.67
Returns to Risk	\$33,000	\$220.00

Notes:

Breakeven Analysis:

	- 10%	Base	+ 10%
		Yield	
<u>Price</u>	6.75	7.50	8.25
Operating Cost Breakeven	\$88.12	\$79.31	\$72.10
Ownership Cost Breakeven	\$57.07	\$51.36	\$46.69
Total Cost Breakeven	\$145.19	\$130.67	\$118.79
		Price	
<u>Yield</u>	\$144.00	\$160.00	\$176.00
Operating Cost Breakeven	4.1	3.7	3.4
Ownership Cost Breakeven	2.7	2.4	2.2
Total Cost Breakeven	6.8	6.1	5.6

