

## Southwestern Idaho

### Alfalfa Hay

Ben Eborn



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 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 \$60-65 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 an 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. The cost for each operation can be found in Table 2. Costs by month can be found in Table 3.

### Resources: Machinery, Land, Labor & 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 alfalfa 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      | \$9.85    | 15%              | \$11.35        |
| Truck Drivers           | \$13.35   | 15%              | \$15.35        |
| Equipment Operators     | \$15.75   | 25%              | \$19.70        |
| Irrigation Labor        |           |                  |                |
| Set Move: HL & WL       | \$10.75   | 30%              | \$14.00        |
| Continuous Move: CP & L | \$15.75   | 25%              | \$19.70        |

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 6.25 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.

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

### 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.

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## Alfalfa Hay - Treasure Valley - 2017

Number of acres: 150

| Item                                     | Quantity<br>Per Acre | Unit  | Price or<br>Cost | Total<br>Value   | Value or<br>Cost/Acre |
|--|----------------------|-------|------------------|------------------|-----------------------|
| <b>Gross Returns</b>                     |                      |       |                  |                  |                       |
| Alfalfa Hay                              | 7.50                 | ton   | 130.00           | 146,250          | \$975.00              |
|  |                      |       |                  | 0                | \$0.00                |
|  |                      |       |                  | 0                | \$0.00                |
| <b>Total Gross Returns</b>               |                      |       |                  | <b>\$146,250</b> | <b>\$975.00</b>       |
| <b>Operating Inputs</b>                  |                      |       |                  |                  |                       |
| <b>Fertilizer:</b>                       |                      |       |                  | <b>\$10,215</b>  | <b>\$68.10</b>        |
| Dry Nitrogen                             | 15.00                | lb    | 0.40             | 900              | 6.00                  |
| Dry P2O5                                 | 75.00                | lb    | 0.38             | 4,275            | 28.50                 |
| 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                  |
| <b>Pesticides:</b>                       |                      |       |                  | <b>\$2,783</b>   | <b>\$18.55</b>        |
| Metribuzin 75DF                          | 1.00                 | lb    | 11.50            | 1,725            | 11.50                 |
| Warrior II w/Zeon Tech                   | 3.00                 | fl oz | 2.35             | 1,058            | 7.05                  |
|  |                      |       |                  | 0                | 0.00                  |
|  |                      |       |                  | 0                | 0.00                  |
|  |                      |       |                  | 0                | 0.00                  |
|  |                      |       |                  | 0                | 0.00                  |
| <b>Custom &amp; Consultants:</b>         |                      |       |                  | <b>\$42,525</b>  | <b>\$283.50</b>       |
| Custom Fertilize                         | 1.00                 | acre  | 7.75             | 1,163            | 7.75                  |
| Custom Swath & Rake                      | 4.00                 | acre  | 23.00            | 13,800           | 92.00                 |
| Custom Bale: 1-ton                       | 7.50                 | ton   | 18.00            | 20,250           | 135.00                |
| Custom Haul & Stack: 1-ton               | 7.50                 | ton   | 6.50             | 7,313            | 48.75                 |
|  |                      |       |                  | 0                | 0.00                  |
| <b>Irrigation:</b>                       |                      |       |                  | <b>\$8,475</b>   | <b>\$56.50</b>        |
| Water Assessment                         | 1.00                 | acre  | 53.50            | 8,025            | 53.50                 |
| Repairs - Conc. Ditch                    | 1.00                 | acre  | 3.00             | 450              | 3.00                  |
|  |                      |       |                  | 0                | 0.00                  |
| <b>Machinery:</b>                        |                      |       |                  | <b>\$1,881</b>   | <b>\$12.54</b>        |
| Fuel - Gas                               | 1.28                 | gal   | 2.55             | 490              | 3.26                  |
| Fuel - Diesel                            | 1.65                 | gal   | 2.35             | 582              | 3.88                  |
| Fuel - Road Diesel                       | 0.63                 | gal   | 2.85             | 269              | 1.80                  |
| Lube                                     | 1.00                 | \$    | 1.34             | 201              | 1.34                  |
| Machinery Repair                         | 1.00                 | \$    | 2.26             | 339              | 2.26                  |
| <b>Labor:</b>                            |                      |       |                  | <b>\$13,836</b>  | <b>\$92.24</b>        |
| Equipment Operator Labor                 | 1.20                 | hrs   | 19.70            | 3,546            | 23.64                 |
| Irrigation Labor                         | 4.90                 | hrs   | 14.00            | 10,290           | 68.60                 |
|  |                      |       |                  | 0                | 0.00                  |
| Interest on Operating Capital a          | 6.25%                |       |                  | \$1,673          | \$11.15               |
| <b>Total Operating Costs</b>             |                      |       |                  | <b>\$81,387</b>  | <b>\$542.58</b>       |
| <b>Operating Costs per Unit</b>          |                      |       |                  | <b>\$10,852</b>  | <b>\$72.34</b>        |
| <b>Net Returns Above Operating Costs</b> |                      |       |                  | <b>\$64,863</b>  | <b>\$432.42</b>       |

| <b>Alfalfa Hay - Treasure Valley - 2017</b> |                 | <b>Number of acres: 150</b> |                 |
|---|-----------------|-----------------------------|-----------------|
| General Overhead                            |                 | 2,100                       | 14.00           |
| Land Rent                                   |                 | 33,750                      | 225.00          |
| Management Fee                              |                 | 6,750                       | 45.00           |
| Property Taxes                              |                 | 0                           |                 |
| Property Insurance                          |                 | 207                         | 1.38            |
| Investment Repairs                          |                 | 0                           |                 |
| Capital Recovery - Equipment                |                 | 3,245                       | 21.63           |
| Alfalfa Establishment - Est. Amort. Cost    |                 | 9,654                       | 64.36           |
| <b>Total Ownership Costs</b>                |                 | <b>\$55,706</b>             | <b>\$371.37</b> |
| <b>Ownership Costs per Unit</b>             |                 | <b>\$7,427</b>              | <b>\$49.52</b>  |
| <b>Total Costs per Acre</b>                 |                 | <b>\$137,092</b>            | <b>\$913.95</b> |
| <b>Total Cost per Unit</b>                  |                 | <b>\$18,279</b>             | <b>\$121.86</b> |
| <b>Returns to Risk</b>                      |                 | <b>\$9,158</b>              | <b>\$61.05</b>  |
| Notes:                                      |                 |                             |                 |
|   |                 |                             |                 |
|   |                 |                             |                 |
|   |                 |                             |                 |
|   |                 |                             |                 |
|   |                 |                             |                 |
| <b><u>Breakeven Analysis:</u></b>           | -               | Base                        | +               |
|   | 10%             |                             | 10%             |
|   |                 | <b>Yield</b>                |                 |
| <u>Price</u>                                | <b>6.75</b>     | <b>7.50</b>                 | <b>8.25</b>     |
| Operating Cost Breakeven                    | \$80.38         | \$72.34                     | \$65.77         |
| Ownership Cost Breakeven                    | \$55.02         | \$49.52                     | \$45.01         |
| Total Cost Breakeven                        | \$135.40        | \$121.86                    | \$110.78        |
|   |                 | <b>Price</b>                |                 |
| <u>Yield</u>                                | <b>\$117.00</b> | <b>\$130.00</b>             | <b>\$143.00</b> |
| Operating Cost Breakeven                    | 4.6             | 4.2                         | 3.8             |
| Ownership Cost Breakeven                    | 3.2             | 2.9                         | 2.6             |
| Total Cost Breakeven                        | 7.8             | 7.0                         | 6.4             |

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