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2015 Costs and Returns for Flood Irrigated Alfalfa, Box Elder County

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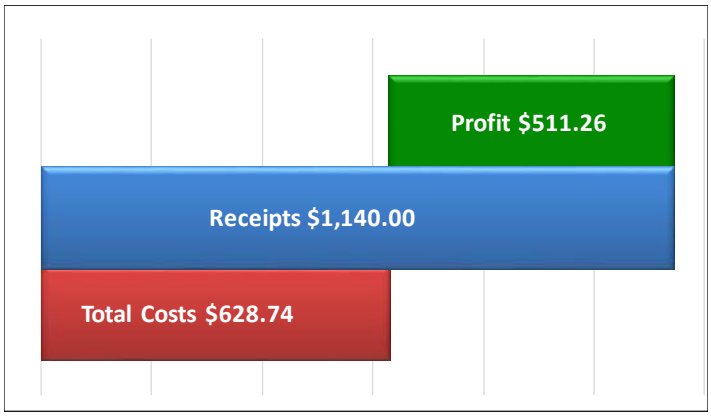

Figure 1. Estimated Receipts, Costs and Profit for Flood Irrigated Alfalfa, 2015.

INTRODUCTION

Enterprise budgets are the building blocks of a farm or ranch. They represent estimates of income and expenses for a specific period of time using a set of production practices and inputs for that enterprise.

The budget in Table 1 on the following page contains sample costs and returns to establish and produce alfalfa under flood irrigation in Box Elder County. It is intended to be a guide used to estimate income and expenses, list inputs and production practices and provide a framework for the whole farm plan.

Farm. The representative farm consists of 720 acres of farmland that is both leased and owned on which 250 acres are cultivated for irrigated alfalfa production and the remaining acres consist of wheat, silage or grain corn production. The market value for irrigated agricultural land with water rights varies widely by area and soil type. In this budget, land is valued at $4,500 per acre. Flood irrigation is used for all crops. Water is leased at the rate of $18/acre.

Receipts. Commodity prices were determined from an average of December 2014 and January 2015 weekly Utah Department of Agriculture and Food Market News Reports. Production average of 6 tons per acre is determined by interviews with local producers and crop advisors.

Inputs and Services. Inputs and services include crop insurance, fertilizer, pesticides, seed, seasonal employees, irrigation and water assessment. Input and chemical prices are determined from interviews with seed, fertilizer and chemical dealers.

Seasonal Employees. Two seasonal employees are hired a total of 2,500 hrs. per year and are paid a base wage plus FICA at the rate of $13.07/hr. including employer's share of payroll tax (USDA ERS) The total annual cost is $32,680 for the 720 acre farm. The average labor cost per acre is estimated at $45.39.

Field Operations and Operating Interest. The practices described are not the recommendations of Utah State University, but rather the production practices and materials considered as typical of a well-managed farm in the region, as determined by interviews with producers and agribusiness representatives. Costs, materials, and practices are not applicable to all situations as management and cultural practices vary among growers and regions. The interest rate of 5% is charged for 6 months on operating capital needed to produce this crop. Fuel costs were significantly lower at the time of this printing. As a result, field operation costs were lowered by 5.5%.

Machinery Costs. Machinery variable costs are determined by using average established custom rates to cover machine and equipment operating costs. These rates were obtained from two publications: 1) USU Custom Rates Survey Report 2009/2010 (Drollette 2010). 2) Custom Rates for Idaho Agricultural Operations 2010-2011 (Patterson and Painter 2011).

Table 1. 2015 Costs and Returns for Flood Irrigated Alfalfa

Receipts	Quantity per acre	Unit	2015 Values Price/Unit	2015 Values Value/Acre	2015 Values Total	2014 Values Price/Unit	2014 Values Value/Acre	% Change
Alfalfa (Premium Dairy)	6	tons	$190.00	$1,140.00		$180.00	$1,080.00	5.6%
Subtotal Receipts					$1,140.00		$1,080.00	
Years in Production	5							
Inputs and Services								
Crop Insurance (CAT)	1	acre	$0.83	$0.83		$0.83	$0.83	0.0%
Fertilizer								
11-52-0	75	units	$0.56	$42.10		$0.50	$37.29	12.9%
0-0-60	150	units	$0.44	$65.75		$0.52	$78.44	-16.2%
Application	1	acre	$6.00	$6.00		$6.00	$6.00	0.0%
Pesticides								
Lambda-cyhalothrin	4	oz	$0.71	$2.85		$0.77	$3.09	-7.9%
Hexazinone - applied once during the life of the crop	1	qt	$23.01	$4.60		$21.25	$4.25	8.3%
Glyphosate (Roundup Ready Alfalfa	1	qt	$7.67	$7.67		$8.88	$8.88	-13.6%
Application	2.2	acre	$6.00	$13.20		$6.00	$13.20	0.0%
Seed (1/5 of total cost of seed)	15	lbs	$6.65	$19.95		$7.35	$22.05	-9.5%
Seasonal Employees	1	acre	$45.39	$45.39		$45.39	$45.39	0.0%
Irrigation Water Assessment	1	acre	$18.00	$18.00		$18.00	$18.00	0.0%
Interest on Inputs and Services	**Rate**	**Term**	**Principle**		**'14 Rate**	**Principle**		
	5.0%	0.50/yr	$226.34	$5.66	5.5%	$237.42	$6.53	-13.3%
Subtotal Inputs and Services					$231.99		$243.95	-4.9%
Alfalfa Establishment Costs	Times							
Disc	0.2	acre	$14.54	$2.91		$15.39	$3.08	-5.5%
Plow	0.2	acre	$27.70	$5.54		$29.31	$5.86	-5.5%
Roller Harrow	0.2	acre	$13.51	$2.70		$14.30	$2.86	-5.5%
Land Plane	0.2	acre	$8.51	$1.70		$9.00	$1.80	-5.4%
Plant	0.2	acre	$15.18	$3.04		$16.06	$3.21	-5.5%
Alfalfa Harvest Operations								
Swath	4	acre	$18.00	$72.00		$18.00	$72.00	0.0%
Rake	4	acre	$6.50	$26.00		$6.50	$26.00	0.0%
Bale	6	ton	$17.50	$105.00		$17.50	$105.00	0.0%
Retrieve and Stack	6	ton	$6.31	$37.86		$6.31	$37.86	0.0%
Subtotal Establishment and Harvest Operations					$256.75		$257.67	-0.4%
Total Input, Services and Field Operation Costs (Variable Costs)					$488.74		$501.62	-2.6%
Contribution Margin					$651.26		$578.38	12.6%
Overhead								
Accounting, liability insurance, vehicle cost, office expense				$15.00			$15.00	
Cash lease for land (includes property tax and water assessment)				$125.00			$125.00	
Total Overhead					$140.00		$140.00	0.0%
Total Costs					$628.74		$641.62	-2.0%
Net Returns to Owner (for unpaid management and risk)					$511.26		$438.38	16.6%

Yield Breakeven	2015	2014	% Change	Price Breakeven	2015	2014	% Change
Tons Necessary to Cover Variable Costs	2.57 tons	2.79 tons	-7.7%	Operating Costs ($/ton)	$81.46	$83.60	-2.6%
Tons Necessary to Cover Fixed Costs	0.74 tons	0.78 tons	-5.3%	Fixed Costs ($/ton)	$23.33	$23.33	0.0%
Tons Necessary to Cover Total Costs	3.31 tons	3.56 tons	-7.2%	Total Costs ($/ton)	$104.79	$106.94	-2.0%

FINANCIAL AND PRODUCTION ANALYSIS

Contribution Margin. This represents the portion of sales revenue from the operation that is not consumed by variable costs and so contributes to the coverage of fixed costs and net profit. This concept is one of the key building blocks of breakeven analysis as well as whole farm budgeting.

Contribution Margin Ratio. A percentage total sales that is not consumed by variable costs. For example, a contribution margin ratio of 22.2% means that for each dollar increase in sales, total contribution margin will increase by 22.2 cents.

Fixed Costs (Overhead). These are costs that take place irrespective of production. For example, fixed costs include depreciation on equipment and buildings, property taxes, interest on land, equipment or buildings, etc.

Net Income or Profit. Sometimes referred to as net profit, is the operation's total sales minus total costs.

Net Income or Profit Ratio. A ratio of profitability calculated as net income of alfalfa divided by total sales. The net income or profit ratio is very useful in determining profitability and is displayed as a percentage. A profit margin or net returns of 45% means the farm has a net income of 45 cents for every dollar of sales.

Price Breakeven. Breakeven analysis is a tool used to determine the relationship between the revenue and costs associated with an enterprise. Price breakeven represents the price point which must be reached to cover costs of the enterprise. Breakeven can be calculated on variable costs and fixed costs.

Production or Yield Breakeven. This is the production point which total expenses and total revenue are equal or the bushels or tons needed to cover costs of the enterprise.

Variable Costs (Operating). Variable or input costs are those costs that change with production. These costs include fertilizer, seed, chemicals, hourly labor and other inputs which are directly associated with alfalfa production.

Calculating Your Own Budget with Excel. To download a free Excel spreadsheet of this and other crop and livestock enterprise budgets, go to http://extension.usu.edu/boxelder and select the Agriculture – Crop/Livestock Budgets link.

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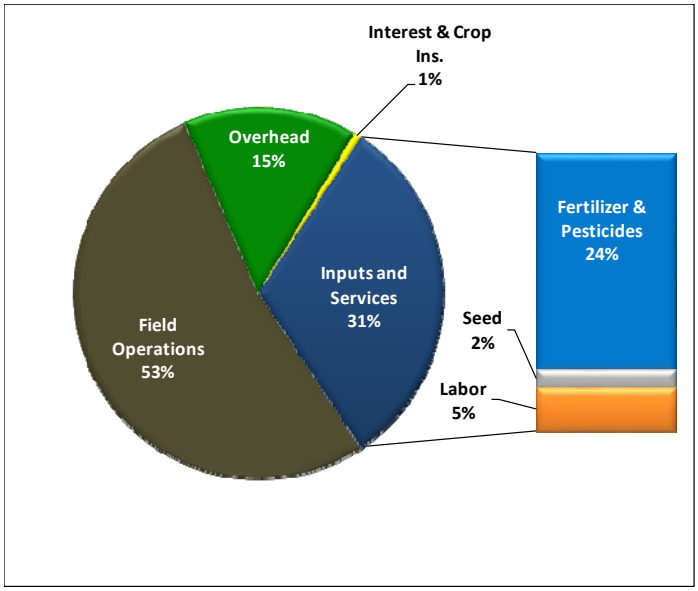

Figure 2. Percent Input, Field Operations and Overhead Required to Produce Alfalfa.

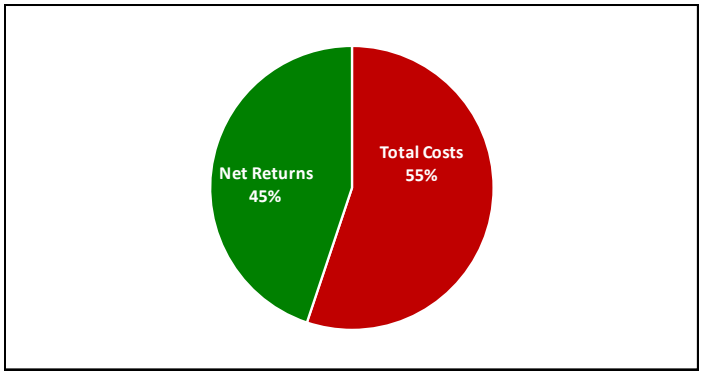

Figure 2. Net Income or Profit Margin.

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Drollette, S.A. (2010). Custom Rates Survey Report 2009/2010. Department of Applied Economics, Utah State University AG/ECON/2010-02RM.

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Table 2. Net Income (Total Sales per Acre – Total Costs per Acre)

Total Costs	Total Sales per Acre				
per Acre	$1,040	$1,090	$1,140	$1,190	$1,240
$529	$511	$561	$611	$661	$711
$579	$461	$511	$561	$611	$661
$629	$411	$461	$511	$561	$611
$679	$361	$411	$461	$511	$561
$729	$311	$361	$411	$461	$511

Table 3. Net Income / Total Sales Ratio (Net Income per Acre / Total Sales per Acre)

Net	Total Sales per Acre				
Income/Acre	$1,040	$1,090	$1,140	$1,190	$1,240
$611	58.8%	56.1%	53.6%	51.4%	49.3%
$561	54.0%	51.5%	49.2%	47.2%	45.3%
$511	49.2%	46.9%	44.8%	43.0%	41.2%
$461	44.4%	42.3%	40.5%	38.8%	37.2%
$411	39.5%	37.7%	36.1%	34.6%	33.2%

Table 4. Contribution Margin (Total Sales per Acre - Variable Costs per Acre)

Variable Costs	Total Sales per Acre				
per Acre	$1,040	$1,090	$1,140	$1,190	$1,240
$389	$651	$701	$751	$801	$851
$439	$601	$651	$701	$751	$801
$489	$551	$601	$651	$701	$751
$539	$501	$551	$601	$651	$701
$589	$451	$501	$551	$601	$651

Table 5. Contribution Margin Ratio (Contribution Margin per Acre / Total Sales per Acre)

Contribution	Total Sales per Acre				
Margin	$1,040	$1,090	$1,140	$1,190	$1,240
$751	72.2%	68.9%	65.9%	63.1%	60.6%
$701	67.4%	64.3%	61.5%	58.9%	56.6%
$651	62.6%	59.7%	57.1%	54.7%	52.5%
$601	57.8%	55.2%	52.7%	50.5%	48.5%
$551	53.0%	50.6%	48.4%	46.3%	44.5%

Table 6. Production or Yield Breakeven (Total Costs per Acre / Alfalfa Price per Ton)

Price	Total Costs				
per Ton	$529	$579	$629	$679	$729
$210	2.5 tons	2.8 tons	3.0 tons	3.2 tons	3.5 tons
$200	2.6 tons	2.9 tons	3.1 tons	3.4 tons	3.6 tons
$190	2.8 tons	3.0 tons	3.3 tons	3.6 tons	3.8 tons
$180	2.9 tons	3.2 tons	3.5 tons	3.8 tons	4.0 tons
$170	3.1 tons	3.4 tons	3.7 tons	4.0 tons	4.3 tons

Table 7. Production Breakeven (Total Costs per Acre / Alfalfa Price per Ton)

Yield	Total Costs				
per Acre	$529	$579	$629	$679	$729
8.0 tons	$66/ton	$72/ton	$79/ton	$85/ton	$91/ton
7.0 tons	$76/ton	$83/ton	$90/ton	$97/ton	$104/ton
6.0 tons	$88/ton	$96/ton	$105/ton	$113/ton	$121/ton
5.0 tons	$106/ton	$116/ton	$126/ton	$136/ton	$146/ton
4.0 tons	$132/ton	$145/ton	$157/ton	$170/ton	$182/ton