



## Pasture

C. Wilson Gray, Ron Thaemert, William F. Hazen, and Robert L. Smathers



### Background and Assumptions

Economic costs are used in the University of Idaho costs and returns estimates. All resources are valued based on market price or opportunity cost. Input prices are based on the U of I's annual survey of agricultural supply companies. Except for contract crops, the selling price is a 10-year average. The costs and returns estimate shown here is typical for producing forage in Southcentral Idaho. Production practices most closely represent those in Gooding, Jerome, and Twin Falls counties.

Although production practices may be similar for individual farms, each 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 quality of management are all crucial factors that influence costs. The costs and returns estimate shown here is typical for pasture in southcentral Idaho. Production practices most closely represent those in Gooding and Jerome counties.

#### The Model Farm

The costs and returns estimate models a 133 acre pasture that is divided into 30 sections for rotational grazing. Animals are rotated between the pastures to allow for regrowth. The pasture is sprinkler irrigated by a center pivot with surface water delivered from an irrigation district. The district charges a flat fee per acre for water.

#### Grazing, Tillage, Fertilization and Pest Control

Light grazing occurs in late summer/early fall of the establishment year at a rate of 1.25 animal units per acre. Grazing commences the first part of April on successive years and continues through mid-October with a stocking rate of 2 animal units per acre. It is assumed that the stand life of the pasture is about 7 years, including the establishment year. Tillage costs are incurred only in the year pasture is established and should be prorated along with other establishment costs over the pasture production years. This is approximately \$50.00 per acre assuming a 7 year life. The pasture is custom fertilized twice during the growing season at a rate of 60 pounds of nitrogen per application. Spot spraying is done as needed in the spring for broadleaf weed control. No insecticides are applied. In the fall, approximately 5 tons of manure is spread on the pasture and spike harrowed to distribute. Irrigation begins in mid-April and continues through October. The pasture is irrigated 3/4 inches per

pivot rotation for a total of 37 inches of water in 50 irrigations.

#### Fencing and Equipment

It is assumed that the perimeter of the field is fenced with 4-strand barbed wire with three sets of 1-wire portable cross fence to divide the field for rotational grazing. Total fencing requirement for 160 acres is 10,560 lineal feet of 4-wire perimeter fence and 5,600 feet of 1-wire cross fence. Metal posts and corners are used for supports on the perimeter fence and high strength steep-in posts are used on the cross fence.

Watering equipment is accounted for in the budget (i.e. stock tanks, water lines, etc.). Portable tanks are utilized to move with the paddocks and the water is supplied by the canal system.

#### Resources: Machinery, Land, Labor, and Capital

Table 3 lists the tractors, trucks, and other equipment used for pasture production, along with their operating and ownership costs. All machinery is valued at 75 percent of new prices. This adjustment reduces the machinery repair operating cost, and the depreciation and interest ownership costs on equipment by 25 percent.

The land charge is cash rent and covers the ownership costs (depreciation, interest, and insurance) on the irrigation system. A labor charge is made for all labor pertaining to field operations and includes a base rate plus overhead expenses. Custom charges account for those field operations that are contracted out. A management charge, 5 percent of gross returns, is included as an ownership cost.

Labor to operate machinery is valued at \$13.15 per hour, while irrigation and non-machine labor are valued at \$8.75 and \$7.70, respectively. The non-machine rate accounts for extra planting labor. Labor rates include a base wage plus a percentage for Social Security, Medicare, unemployment insurance, and other labor overhead expenses. Labor overhead amounts to 15 percent for non-machine labor, 25 percent for irrigation labor, and 30 percent for machinery labor.

Interest on operating capital is charged from the time an input is applied until the month of harvest and calculated at a nominal rate of 7.5 percent. Interest on intermediate term capital is calculated using a rate of 7.75 percent. A general overhead charge of 2.5 percent of operating expenses is included to cover unallocated costs such as office expenses, legal and accounting fees, and utilities.

**Table 1. Costs And Returns Per Acre to Produce Forage  
Southcentral Idaho Pasture Production**

**EBB3-Pa-05**

	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>Gross Returns</b>					
Forage	14.00	AUM	15.00	210.00	_____
Total Gross Returns For Forage				210.00	_____
<b>Operating Costs</b>					
Custom:					
Custom Haul Manure	5.00	ton	2.00	10.00	_____
Custom Fertilize	2.00	acre	5.70	11.40	_____
Irrigation:					
Irrigation Power	37.00	acin	1.39	51.43	_____
Labor (irrigation)	1.85	hr	8.75	16.19	_____
Water Assessment	1.00	acre	30.20	30.20	_____
Irrigation Repairs	37.00	acin	0.55	20.35	_____
Pesticide:					
2,4-D Amine	0.21	qt	3.65	0.77	_____
Fertilizer:					
Urea	120.00	lb	0.18	21.60	_____
Labor (machine)	1.36	hrs	13.15	17.86	_____
Labor (non-machine)	2.38	hrs	7.70	18.33	_____
Fuel - Gas	1.83	gal	2.26	4.14	_____
Fuel - Diesel	0.79	gal	2.07	1.63	_____
Lube				0.86	_____
Machinery Repair				1.10	_____
Interest on Operating Capital @ 7.50%				7.14	_____
Total Operating Costs per Acre				212.98	_____
Net Returns Above Operating Costs				-2.98	_____
<b>Cash Ownership Costs</b>					
General Overhead				5.50	_____
Land Rent				90.00	_____
Management Fee				10.50	_____
Property Taxes (machinery)				0.00	_____
Property Insurance				1.04	_____
Investment Repairs				2.26	_____
Total Cash Ownership Costs per Acre				109.29	_____
<b>Non-Cash Ownership Costs (depreciation and interest)</b>					
Perimeter fence				2.87	_____
Portable fence				1.04	_____
Water system				0.78	_____
Amortized Establishment Cost				57.27	_____
Equipment				6.49	_____
Total Non-Cash Ownership Costs per Acre				68.44	_____
Total Costs per Acre				390.71	_____
Returns to Risk				-180.71	_____

**Table 2. Monthly Summary of Cash Expenses per Acre**

**EBB3-Pa-05**

	Nov 04	Dec 04	Jan 05	Feb 05	Mar 05	Apr 05	May 05	Jun 05	Jul 05	Aug 05	Sep 05	Oct 05	Total
<b>Preharvest:</b>													
Custom haul manure	10.00												10.00
Harrow	2.64					2.64							5.27
Irrigate	1.83					5.48	5.48	10.96	14.62	18.27	9.14	1.83	67.62
Assessments						30.20							30.20
Repairs						20.35							20.35
Fence Maintenance						7.70							7.70
Move portable fence							1.77	1.77	1.77	1.77	1.77	1.77	10.63
Spot spray for weeds							5.16	5.16	5.16				15.49
Fertilize								16.50		16.50			33.00
General Truck Use	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	5.58
<b>Total Preharvest Costs</b>	<b>14.93</b>	<b>0.47</b>	<b>0.47</b>	<b>0.47</b>	<b>0.47</b>	<b>66.83</b>	<b>12.88</b>	<b>34.87</b>	<b>22.02</b>	<b>37.01</b>	<b>11.37</b>	<b>4.06</b>	<b>205.84</b>
Interest on Operating Capital	0.09	0.10	0.10	0.10	0.10	0.52	0.60	0.82	0.96	1.19	1.26	1.29	7.14
<b>Operating Costs per Acre</b>	<b>15.02</b>	<b>0.56</b>	<b>0.56</b>	<b>0.57</b>	<b>0.57</b>	<b>67.36</b>	<b>13.49</b>	<b>35.69</b>	<b>22.98</b>	<b>38.20</b>	<b>12.63</b>	<b>5.35</b>	<b>212.98</b>
<b>Cash Ownership</b>													
General Overhead	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	5.50
Land Rent						90.00							90.00
Management Fee	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	10.50
Property Insurance						1.04							1.04
Investment Repairs	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	2.26
<b>Cash Ownership Costs</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>91.52</b>	<b>2.56</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>1.52</b>	<b>109.29</b>
<b>Total Cash Costs per Acre</b>	<b>16.54</b>	<b>2.08</b>	<b>2.09</b>	<b>2.09</b>	<b>92.09</b>	<b>69.91</b>	<b>15.01</b>	<b>37.21</b>	<b>24.50</b>	<b>39.72</b>	<b>14.16</b>	<b>6.87</b>	<b>322.27</b>

**Table 3. Machinery and Equipment Costs per Hour**

Description	Purchase Price	Years to Trade	Salvage Value	Hours Used	<-Non-Cash-> Ownership		<-----Cash-----> Ownership		<-----Operating----->			Total Costs/Hr.
					Cap. Rec.	Insur.	Taxes	Repairs	Fuel & Lube	Total Oper.		
4-wheeler/tow tank	6500	10	1920	240	2.58	0.07	0.00	0.11	3.40	3.51	6.15	
Pickup 1 - 3/4 ton	37000	8	12913	300	12.88	0.31	0.00	3.59	10.40	13.99	27.19	
Spike Harrow - 20'	1000	15	96	85	0.99	0.02	0.00	0.12	0.00	0.12	1.13	
Tractor - 75hp	52000	15	10123	440	9.54	0.26	0.00	1.48	8.77	10.25	20.05	

Net Returns Per Acre Above Operating Costs For Forage  
Yield (AUM/acre)

	9.80	11.20	12.60	14.00	15.40	16.80	18.20
10.50	-110	-95	-81	-66	-51	-37	-22
12.00	-95	-79	-62	-45	-28	-11	5
13.50	-81	-62	-43	-24	-5	14	33
15.00	-66	-45	-24	-3	18	39	60
16.50	-51	-28	-5	18	41	64	87
18.00	-37	-11	14	39	64	89	115
19.50	-22	5	33	60	87	115	142

Net Returns Per Acre Above Cash Costs For Forage  
Yield (AUM/acre)

	9.80	11.20	12.60	14.00	15.40	16.80	18.20
10.50	-219	-205	-190	-175	-161	-146	-131
12.00	-205	-188	-171	-154	-137	-121	-104
13.50	-190	-171	-152	-133	-114	-95	-77
15.00	-175	-154	-133	-112	-91	-70	-49
16.50	-161	-137	-114	-91	-68	-45	-22
18.00	-146	-121	-95	-70	-45	-20	5
19.50	-131	-104	-77	-49	-22	5	33

Net Returns Per Acre Above Total Costs For Forage  
Yield (AUM/acre)

	9.80	11.20	12.60	14.00	15.40	16.80	18.20
10.50	-288	-273	-258	-244	-229	-214	-200
12.00	-273	-256	-240	-223	-206	-189	-172
13.50	-258	-240	-221	-202	-183	-164	-145
15.00	-244	-223	-202	-181	-160	-139	-118
16.50	-229	-206	-183	-160	-137	-114	-90
18.00	-214	-189	-164	-139	-114	-88	-63
19.50	-200	-172	-145	-118	-90	-63	-36

The practices and chemicals specified here are based on survey information representative of typical operations. They are not recommendations. Because of constantly changing labels, laws, and regulations, the University of Idaho can assume no liability for the consequences of use of chemicals specified here. In all cases, read and follow the directions and precautionary statements on the specific pesticide product label. To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

**The Authors** - C. Wilson Gray is Extension agricultural economist in the University of Idaho District 3 Extension Office, Twin Falls. Ron Thamerit is Extension educator in Blaine County at Hailey. William F. Hazen is Extension educator in Gooding County at Gooding. Robert L. Smathers is a farm and ranch economics specialist in the UI Department of Agricultural Economics and Rural Sociology, Moscow.



Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Charlotte Eberlein, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83843. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws.