

# 2009 COSTS OF PRODUCING ALFALFA HAY UNDER CENTER PIVOT IRRIGATION IN THE COLUMBIA BASIN OF WASHINGTON STATE

Herbert Hinman, John Kugler, Kate Painter, Phil Petersen<sup>1</sup>



*Photo: Marlin E. Rice, Iowa State University*

<sup>1</sup> Authorship is equally shared among the four authors, all at Washington State University: Herbert Hinman (retired) was an Extension Economist; John Kugler (retired) was an area educator (agronomy), Grant/Adams counties; Kate Painter is an analyst for the Center for Sustaining Ag and Natural Resources; Phil Petersen is an area educator (agronomy), Benton/Franklin counties.

**Table 1. Summary of Returns by Crop and Rotation (\$/acre)**

*Adjust yield and price information in yellow cells to see sensitivity results.*

<u>By Crop:</u>	<u>Unit</u>	<u>Yield per acre</u>	<u>Price per unit</u>	<u>Revenue per acre (\$/acre)</u>	<u>Total Costs (TC) (\$/acre)</u>	<u>Returns over TC (\$/acre)</u>	<u>Total Variable Costs (VC) (\$/acre)</u>	<u>Returns over VC (\$/acre)</u>
Establishment Costs, Custom or Owner-Operator	ton			\$0	\$415	-\$415	\$235	-\$235
Small (2-tie) Bale Production, Custom	ton	8	\$220	\$1,760	\$1,418	\$342	\$846	\$914
Large (1-ton) Bale Production, Custom	ton	8	\$200	\$1,600	\$1,401	\$199	\$829	\$771
Small (2-tie) Bale Production, Owner-Operator	ton	8	\$220	\$1,760	\$1,282	\$478	\$621	\$1,139
Large (1-ton) Bale Production, Owner-Operator	ton	8	\$200	\$1,600	\$1,265	\$335	\$608	\$992

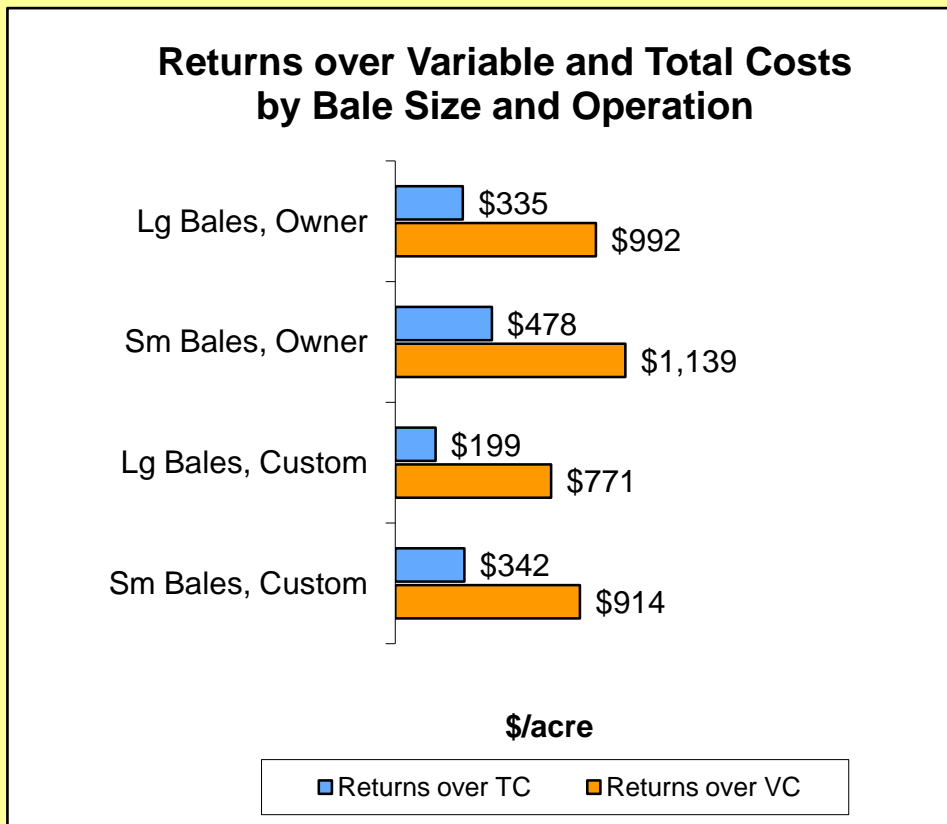
**ASSUMPTIONS:**

1. The enterprise budget is for alfalfa grown under one or more 125-acre center pivot irrigation systems.
2. The land rental rate is \$400 per acre; this rate can be changed in the Input Cost tab.
3. The landowner furnished the center pivot system and the operator pays the irrigation charges, including repairs and power (see budget).
4. Irrigation labor is estimated at .85 hour per acre per year.
5. All labor costs are estimated at \$20.00/hour. This value can be changed in the Input Costs tab.
6. Interest rate is 8% for operating loans and the use of equity capital. This value can be changed in the Input Costs tab.
7. The interest rate on machinery loans is 7.5%.
8. Click on the links below to view input cost and machinery complement assumptions.

[Input Costs](#)

[Production Machinery](#)

**Figure 1. Graphical Illustration of Returns by Crop and Rotation (\$/acre)**



**Table 2. 2009 Input Cost Assumptions for Producing Alfalfa**

NOTE: Changing the values in the orange cells will cause all formulas with these inputs to be adjusted throughout the worksheet.

Item	Unit	Price/unit
<b>Fuel:</b>		
Diesel	gal	\$2.00
Gas	gal	\$2.25
<b>Seed:</b>		
Alfalfa seed	lb	\$3.00
<b>Fertilizer:</b>		
Dry Nitrogen	lb	\$0.49
Dry Phosphate	lb	\$1.17
Potash	lb	\$0.70
Dry Sulfur	lb	\$0.38
<b>Pesticides:</b>		
Eptam 7E	qt	\$9.29
Malathion 5EC	qt	\$7.95
Sencor 4L	qt	\$23.75
Gopher control	ac	\$6.00
<b>Labor:</b>		
Hourly machine labor*	hour	\$20.00
<b>Land Cost:</b>		
Cash rent	hour	\$400.00
<b>Interest Rates:</b>		
Operating loan	percent	8.00%
Machinery loan	percent	7.50%

\*Includes all applicable state and federal taxes.

**Table 3. Schedule of Operations for Establishing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation**

Month	Operation	Tooling	Materials/Service
Fall	Irrigation	Center Pivot Leased with Land	\$12 Power, \$11.25 Water, \$4.25 Labor, \$6.25/Acre Repair (25% Annual Cost)
August	Disc & Pack	250HP-WT, 26' Tandem Disk & Pack	
August	Soil Test	Custom	\$0.30/Acre
August	Fertilize	Custom Ground Application	\$7.50/Acre, Fertilizer approx. \$100/Acre
August	Disc Ripper	250HP-WT, 17.5' Disc Ripper	
August	Seedbed Maker	150HP-WT, 20' Seedbed Maker	
August	Plant	150HP-WT, 20' Double Disc Drill	20 lbs Alfalfa Seed @ \$3/lb
August	Herbicide Spray	Custom Ground Application	\$7.50/Acre, Herbicide approx. \$12/Acre
August	Insecticide Spray	Custom Aerial Application	\$7.50/Acre, Insecticide approx. \$7/Acre

**Table 4. Production Costs for Establishing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation**

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
<b>Variable Costs</b>				
<b>Seed:</b>				<b>\$60.00</b>
Alfalfa Seed	20	lb	\$3.00	\$60.00
<b>Fertilizer:</b>				<b>\$181.75</b>
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Dry Nitrogen (N)	25	lb	\$0.49	\$12.25
Dry Phosphate (P)	100	lb	\$1.17	\$117.00
Dry Potash (K)	75	lb	\$0.70	\$52.50
<b>Pesticides:</b>				<b>\$19.00</b>
<i>Rates &amp; chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>The following cost estimates are typical:</i>				
Herbicide	1	acre	\$12.00	\$12.00
Insecticide	1	acre	\$7.00	\$7.00
<b>Custom &amp; Consultants:</b>				<b>\$22.80</b>
Soil Test	1	acre	\$0.30	\$0.30
Fertilizer Ground Application	1	acre	\$7.50	\$7.50
Herbicide Ground Application	1	acre	\$7.50	\$7.50
Insecticide Aerial Application	1	acre	\$7.50	\$7.50
<b>Irrigation:</b>				<b>\$33.75</b>
Irrigation Power-CP	1	acre	\$12.00	\$12.00
Water Access	1	acre	\$11.25	\$11.25
Irrigation Repairs	1	acre	\$6.25	\$6.25
Irrigation Labor-CP	1	acre	\$4.25	\$4.25
<b>Other:</b>				<b>\$33.70</b>
Fuel	6.30	gal	\$2.00	\$12.59
Lubricants	1	acre	\$2.22	\$2.22
Machinery Repairs	1	acre	\$7.89	\$7.89
Storage Facility & Equip. Repairs				\$0.00
Machinery Labor	0.55	acre	\$20.00	\$11.00
Other Labor				\$0.00
Overhead				\$17.55
Operating Interest				\$14.04
<b>Total Variable Costs</b>				<b>\$382.59</b>
Variable Costs per Unit				

**Table 4. Production Costs for Establishing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation**

<b>Fixed Costs:</b>	
Machinery depreciation	\$17.09
Machinery interest	\$10.57
Machinery insurance, taxes housing, licence	\$4.13
Land Cost	\$0.00
<b>Total Fixed Costs</b>	<b>\$31.79</b>
Fixed Costs per Unit	
<b>Total Costs per Acre</b>	<b>\$414.38</b>
Total Cost per Unit	

**Notes:**

All fixed costs associated with land are allocated to the preceding crop and all straw has been removed.

**Table 5. Schedule of Operations for Producing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Custom Haying**

Month	Operation	Tooling	Materials/Service
February	Soil Test	Custom	\$0.30/Acre
March	Fertilize	Custom Ground Application	\$7.50/Acre, Fertilizer \$100/Acre approx.
March	Weed Control	Custom Ground Application	\$7.50/Acre, Herbicide \$28/Acre approx.
Season	Irrigation	Center Pivot	\$48/Acre Power, \$45 Water, .85 hrs of Labor, \$25/Acre Repair
4X	Swath Hay	Custom	\$18/Acre, 2 Tons/Acre per Swathing
4X	Rake Hay	Custom	\$9.50/Acre, 2 Tons/Acre per Raking
4X	Bale Hay	Custom	\$17/Ton for Small Bales
4X	Haul and Stack	Custom	\$9/Ton for Small Bales
	Tarp Hay	Rental	\$4/Ton



**Table 6. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Custom Haying**

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
<b>Gross Returns</b>				
Alfalfa Hay	8	ton	\$220.00	\$1,760.00
<b>Operating Inputs</b>				
<b>Fertilizer:</b>				<b>\$183.07</b>
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Dry Nitrogen (N)	20	lb	\$0.49	\$9.80
Dry Phosphate (P)	100	lb	\$1.17	\$117.00
Dry Potash (K)	75	lb	\$0.70	\$52.50
Dry Sulfur (S)	10	lb	\$0.38	\$3.77
<b>Pesticides:</b>				<b>\$15.85</b>
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>Common pesticides for alfalfa include the following:</i>				
Malathion (5 lb)	0.5	qt	\$7.95	\$3.98
Sencor 4L	0.5	qt	\$23.75	\$11.88
<b>Custom &amp; Consultants:</b>				<b>\$333.30</b>
Soil Test	1	acre	\$0.30	\$0.30
Fertilizer Ground Application	1	acre	\$7.50	\$7.50
Herbicide Ground Application	1	acre	\$7.50	\$7.50
Swath	4	acre	\$18.00	\$72.00
Rake	4	acre	\$9.50	\$38.00
Bale	8	ton	\$17.00	\$136.00
Haul and Stack	8	ton	\$9.00	\$72.00
Tarping (rental)	8	ton	\$4.00	\$32.00
<b>Irrigation:</b>				<b>\$135.00</b>
Irrigation Power-CP	1	acre	\$48.00	\$48.00
Water Access	1	acre	\$45.00	\$45.00
Irrigation Repairs	1	acre	\$25.00	\$25.00
Irrigation Labor-CP	0.85	acre	\$20.00	\$17.00
<b>Other:</b>				<b>\$79.16</b>
Crop insurance	8	ton	\$2.00	\$16.00
Gopher control	1	acre	\$6.00	\$6.00
Management	1	acre	\$50.00	\$50.00
Fuel	2.28	gal	\$2.00	\$4.56
Lubricants	1	acre	\$0.80	\$0.80
Machinery Repairs	1	acre	\$1.80	\$1.80
Storage Facility & Equip. Repairs				\$0.00
Overhead				\$37.32
Operating Interest				\$29.86

**Table 6. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Custom Haying**

<b>Total Variable Costs</b>					<b>\$845.55</b>
Variable Costs per Unit					\$105.69
<b>Net Returns Above Variable Costs</b>					<b>\$914.45</b>
<b>Fixed Costs:</b>					
Machinery depreciation					\$5.42
Machinery interest					\$3.08
Machinery insurance, taxes housing, licence					\$2.79
Establishment Cost					\$160.79
Land Cost	1	acre	\$400.00		\$400.00
<b>Total Fixed Costs</b>					<b>\$572.08</b>
Fixed Costs per Unit					\$71.51
<b>Total Costs per Acre</b>					<b>\$1,417.64</b>
Total Cost per Unit					\$177.20
<b>Returns to Risk</b>					<b>\$342.36</b>

Notes:

<b>Breakeven Analysis:</b>	-	Base	+
	10%	Yield	10%
<u>Price</u>	7.2	8	8.4
Operating Cost Breakeven	117	106	101
Ownership Cost Breakeven	79	72	68
Total Cost Breakeven	197	177	169
		Price	
<u>Yield</u>	\$198.00	\$220.00	\$242.00
Operating Cost Breakeven	4.3	3.8	3.5
Ownership Cost Breakeven	2.9	2.6	2.4
Total Cost Breakeven	7.2	6.4	5.9

**Table 7. Schedule of Operations for Producing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Custom Haying**

Month	Operation	Tooling	Materials/Service
February	Soil Test	Custom	\$0.30/Acre
March	Fertilize	Custom Ground Application	\$7.50/Acre, Fertilizer approx. \$100/Acre
March	Weed Control	Custom Ground Application	\$7.50/Acre, Herbicide approx. \$28/Acre
Season	Irrigation	Center Pivot	\$48/Acre Power, \$45 Water, .85 Hrs. of Labor, \$25/Acre Repairs
4X	Swath Hay	Custom	\$18/Acre, 2 Tons/Acre per Swathing
4X	Rake Hay	Custom	\$9.50/Acre, 2 Tons/Acre per Raking
4X	Bale Hay	Custom	\$18/Ton for 1-ton Bales
4X	Haul and Stack	Custom	\$4/Ton for 1-ton Bales

**Table 8. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Custom Haying**

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
<b>Gross Returns</b>				
Alfalfa Hay	8	ton	\$200.00	\$1,600.00
<b>Operating Inputs</b>				
<b>Fertilizer:</b>				<b>\$183.07</b>
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Dry Nitrogen (N)	20	lb	\$0.49	\$9.80
Dry Phosphate (P)	100	lb	\$1.17	\$117.00
Dry Potash (K)	75	lb	\$0.70	\$52.50
Dry Sulfur (S)	10	lb	\$0.38	\$3.77
<b>Pesticides:</b>				<b>\$15.85</b>
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>Common pesticides for alfalfa include the following:</i>				
Malathion (5 lb)	0.5	qt	\$7.95	\$3.98
Sencor 4L	0.5	qt	\$23.75	\$11.88
<b>Custom &amp; Consultants:</b>				<b>\$333.30</b>
Soil Test	1	acre	\$0.30	\$0.30
Fertilizer Ground Application	1	acre	\$7.50	\$7.50
Herbicide Ground Application	1	acre	\$7.50	\$7.50
Swath	4	acre	\$18.00	\$72.00
Rake	4	acre	\$9.50	\$38.00
Bale	8	ton	\$18.00	\$144.00
Haul and Stack	8	ton	\$4.00	\$32.00
Tarping (rental)	8	ton	\$4.00	\$32.00
<b>Irrigation:</b>				<b>\$135.00</b>
Irrigation Power-CP	1	acre	\$48.00	\$48.00
Water Access	1	acre	\$45.00	\$45.00
Irrigation Repairs	1	acre	\$25.00	\$25.00
Irrigation Labor-CP	0.85		\$20.00	\$17.00
<b>Other:</b>				<b>\$93.16</b>
Baling twine	8	ton	\$1.75	\$14.00
Crop insurance	8	acre	\$2.00	\$16.00
Gopher control	1	acre	\$6.00	\$6.00
Management	1	acre	\$50.00	\$50.00
Fuel	2.28	gal	\$2.00	\$4.56
Lubricants	1	acre	\$0.80	\$0.80
Machinery Repairs	1	acre	\$1.80	\$1.80
Storage Facility & Equip. Repairs				\$0.00
Other Labor				\$0.00

**Table 8. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Custom Haying**

Overhead					\$38.02
Operating Interest					\$30.42
<b>Total Variable Costs</b>					<b>\$828.81</b>
Variable Costs per Unit					\$103.60
<b>Net Returns Above Variable Costs</b>					<b>\$771.19</b>
<b>Fixed Costs:</b>					
Machinery depreciation					\$5.42
Machinery interest					\$3.08
Machinery insurance, taxes housing, licence					\$2.79
Establishment Cost					\$160.79
Land Cost	1	acre	\$400.00		\$400.00
<b>Total Fixed Costs</b>					<b>\$572.08</b>
Fixed Costs per Unit					\$71.51
<b>Total Costs per Acre</b>					<b>\$1,400.90</b>
Total Cost per Unit					\$175.11
<b>Returns to Risk</b>					<b>\$199.10</b>

Notes:

<b>Breakeven Analysis:</b>	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	7.2	8	8.4
Operating Cost Breakeven	115	104	99
Ownership Cost Breakeven	79	72	68
Total Cost Breakeven	195	175	167
	Price		
<u>Yield</u>	\$180.00	\$200.00	\$220.00
Operating Cost Breakeven	4.6	4.1	3.8
Ownership Cost Breakeven	3.2	2.9	2.6
Total Cost Breakeven	7.8	7.0	6.4

**Table 9. Schedule of Operations for Producing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Owner Operator**

Month	Operation	Tooling	Materials/Service
February	Soil Test	Custom	\$0.30/Acre
March	Fertilize	Custom Ground Application	\$7.50/Acre
March	Weed Control	Custom Ground Application	\$7.50/Acre
Season	Irrigation	Center Pivot	\$48/Acre Power, \$45 Water, .85 hrs of Labor, \$25/Acre Repair
4X	Swath Hay	Self-Propelled Windrower	
4X	Rake Hay	150HP-WT, 20' Side Delivery Rake	
4X	Bale Hay	150HP-WT, 2-Tie Baler	
4X	Haul and Stack	Self-Propelled Bale Wagon	
	Tarp Hay	Rental	\$4/Ton

**Table 10. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Owner Operator**

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
<b>Gross Returns</b>				
Alfalfa Hay	8	ton	\$220.00	\$1,760.00
<b>Operating Inputs</b>				
<b>Fertilizer:</b>				<b>\$173.27</b>
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Dry Nitrogen (N)	20	lb	\$0.49	\$9.80
Dry Phosphate (P)	100	lb	\$1.17	\$117.00
Dry Potash (K)	75	lb	\$0.70	\$52.50
Dry Sulfur (S)	10	lb	\$0.38	\$3.77
<b>Pesticides:</b>				<b>\$15.85</b>
<i>Rates &amp; chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>Common pesticides for alfalfa include the following:</i>				
Malathion (5 lb)	0.5	qt	\$7.95	\$3.98
Sencor 4L	0.5	qt	\$23.75	\$11.88
<b>Custom &amp; Consultants:</b>				<b>\$22.80</b>
Soil Test	1	acre	\$0.30	\$0.30
Fertilizer Ground Application	1	acre	\$7.50	\$7.50
Herbicide Ground Application	1	acre	\$7.50	\$7.50
Insecticide Ground Application	1	acre	\$7.50	\$7.50
<b>Irrigation:</b>				<b>\$135.00</b>
Irrigation Power-CP	1	acre	\$48.00	\$48.00
Water Access	1	acre	\$45.00	\$45.00
Irrigation Repairs	1	acre	\$25.00	\$25.00
Irrigation Labor-CP	0.85	acre	\$20.00	\$17.00
<b>Other:</b>				<b>\$101.15</b>
Baling twine	8	ton	\$3.85	\$30.80
Crop insurance	8	ton	\$2.00	\$16.00
Gopher control	1	acre	\$6.00	\$6.00
Tarping	8	ton	\$4.00	\$32.00
Management	1	acre	\$50.00	\$50.00
Fuel	14.59	gal	\$2.00	\$29.18
Lubricants	1	acre	\$10.85	\$10.85
Machinery Repairs	1	acre	\$22.52	\$22.52
Storage Facility & Equip. Repairs				\$0.00
Machinery Labor	1.93	acre	\$20.00	\$38.60
Other Labor				\$0.00
Overhead				\$15.65
Operating Interest				\$12.52
<b>Total Variable Costs</b>				<b>\$620.85</b>
Variable Costs per Unit				\$77.61
<b>Net Returns Above Variable Costs</b>				<b>\$1,139.15</b>

**Table 10. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Small (2-tie) Bales, Owner Operator**

<b>Fixed Costs:</b>				
Machinery depreciation				\$56.38
Machinery interest				\$31.56
Machinery insurance, taxes housing, licence				\$12.75
Establishment Cost*				\$160.79
Land Cost	1	acre	\$400.00	\$400.00
<b>Total Fixed Costs</b>				<b>\$661.48</b>
Fixed Costs per Unit				\$82.69
<b>Total Costs per Acre</b>				<b>\$1,282.33</b>
Total Cost per Unit				\$160.29
<b>Returns to Risk</b>				<b>\$477.67</b>

Notes:

\*Establishment costs are amortized over the productive life of the stand, which is assumed to be 3 years, at an 8% interest rate.

<b>Breakeven Analysis:</b>	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	7.2	8	8.4
Operating Cost Breakeven	86	78	74
Ownership Cost Breakeven	92	83	79
Total Cost Breakeven	178	160	153
	Price		
<u>Yield</u>	\$198.00	\$220.00	\$242.00
Operating Cost Breakeven	3.1	2.8	2.6
Ownership Cost Breakeven	3.3	3.0	2.7
Total Cost Breakeven	6.5	5.8	5.3



**Table 11. Schedule of Operations for Producing Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Owner Operator**

Month	Operation	Tooling	Materials/Service
February	Soil Test	Custom	\$0.30/Acre
March	Fertilize	Custom Ground Application	\$7.50/Acre, Fertilizer \$100/Acre
March	Weed Control	Custom Ground Application	\$7.50/Acre, Herbicide \$10.75/Acre
Season	Irrigation	Center Pivot	\$48/Acre Power, \$45 Water, .85 Hrs. of Labor, \$25/Acre Repairs
4X	Swath Hay	Self-Propelled Windrower	
4X	Rake Hay	150HP-WT, 20' Side Delivery Rake	
4X	Bale Hay	150HP-WT, 1500-lb Baler	
4X	Haul and Stack	Self-Propelled Bale Wagon	
	Tarp Hay	Rental	\$4/Ton for 1-ton Bales

**Table 12. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Owner Operator**

Item	Quantity Per Acre	Unit	Price or Cost	Value or Cost/Acre
<b>Gross Returns</b>				
Alfalfa Hay	8	ton	\$200.00	\$1,600.00
<b>Operating Inputs</b>				
<b>Fertilizer:</b>				<b>\$173.27</b>
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Dry Nitrogen (N)	20	lb	\$0.49	\$9.80
Dry Phosphate (P)	100	lb	\$1.17	\$117.00
Dry Potash (K)	75	lb	\$0.70	\$52.50
Dry Sulfur (S)	10	lb	\$0.38	\$3.77
<b>Pesticides:</b>				<b>\$15.85</b>
<i>Rates &amp; chemicals will depend on the pests in your crop.</i>				
<i>Consult a certified pesticide applicator or the PNW Pest Control Management Guides.</i>				
<i>Common pesticides for alfalfa include the following:</i>				
Malathion (5 lb)	0.5	qt	\$7.95	\$3.98
Sencor 4L	0.5	qt	\$23.75	\$11.88
<b>Custom &amp; Consultants:</b>				<b>\$22.80</b>
Soil Test	1	acre	\$0.30	\$0.30
Fertilizer Ground Application	1	acre	\$7.50	\$7.50
Herbicide Ground Application	1	acre	\$7.50	\$7.50
Insecticide Ground Application	1	acre	\$7.50	\$7.50
<b>Irrigation:</b>				<b>\$135.00</b>
Irrigation Power-CP	1	acre	\$48.00	\$48.00
Water Access	1	acre	\$45.00	\$45.00
Irrigation Repairs	1	acre	\$25.00	\$25.00
Irrigation Labor-CP	0.85	acre	\$20.00	\$17.00
<b>Other:</b>				<b>\$188.62</b>
Baling twine	8	ton	\$1.75	\$14.00
Crop insurance	8	ton	\$2.00	\$16.00
Gopher control	1	acre	\$6.00	\$6.00
Tarping	8	ton	\$4.00	\$32.00
Management	1	acre	\$50.00	\$50.00
Fuel	13.49	gal	\$2.00	\$26.98
Lubricants	1	acre	\$4.76	\$4.76
Machinery Repairs	1	acre	\$19.28	\$19.28
Storage Facility & Equip. Repairs				\$0.00
Machinery Labor	1.68	acre	\$20.00	\$33.60
Other Labor				\$0.00

**Table 12. Production Costs for Alfalfa Hay Following Wheat or Barley in the Columbia Basin, Center Pivot Irrigation, Large (1-ton) Bales, Owner Operator**

Overhead					\$26.78
Operating Interest					\$21.42
<b>Total Variable Costs</b>					<b>\$607.54</b>
Variable Costs per Unit					\$75.94
<b>Net Returns Above Variable Costs</b>					<b>\$992.46</b>
<b>Fixed Costs:</b>					
Machinery depreciation					\$54.50
Machinery interest					\$30.08
Machinery insurance, taxes housing, licence					\$12.11
Establishment Cost*					\$160.79
Land Cost	1	acre	\$400.00		\$400.00
<b>Total Fixed Costs</b>					<b>\$657.48</b>
Fixed Costs per Unit					\$82.19
<b>Total Costs per Acre</b>					<b>\$1,265.02</b>
Total Cost per Unit					\$158.13
<b>Returns to Risk</b>					<b>\$334.98</b>

Notes:

\*Establishment costs are amortized over the productive life of the stand, which is assumed to be 3 years, at an 8% interest rate.

<b>Breakeven Analysis:</b>	-	Base	+
	10%		10%
	Yield		
<u>Price</u>	7.2	8	8.4
Operating Cost Breakeven	84	76	72
Ownership Cost Breakeven	91	82	78
Total Cost Breakeven	176	158	151
	Price		
<u>Yield</u>	\$180.00	\$200.00	\$220.00
Operating Cost Breakeven	3.4	3.0	2.8
Ownership Cost Breakeven	3.7	3.3	3.0
Total Cost Breakeven	7.0	6.3	5.8

**Table 13. Machinery Complement for Producing Alfalfa Following Wheat or Barley in the Columbia Basin with Center Pivot Irrigation**

Machine Combination	Current Value \$	Annual Usage in Hours or Miles (pickups)	Current Age	Remaining Life	Labor Multiplier	Taxes, Housing, Insurance, License (% of ave. value)	Annual Repair Cost \$	Salvage Value \$	Acres/ Hour	Fuel Type	Fuel Use (gal./hr.)
250HP-WT	100,000	500	5	10		1.20	2,000	26,000		Diesel	11.0
150HP-WT	80,000	500	5	10		1.20	1,530	20,000		Diesel	6.5
26' Tandem Disk & Pack	31,000	150	0	15	1.10	0.60	1,500	3,000	12.0		
17.5' Disk Ripper	25,500	150	0	15	1.10	0.60	1,500	3,000	8.0		
20' Seedbed Maker	17,000	150	0	15	1.10	0.60	800	1,650	9.0		
20' Double Disk Drill	22,000	120	0	12	1.20	3.00	1,250	3,050	6.0		
20' Side Delivery Rake	15,900	200	0	15	1.10	0.60	500	1,800	11.6		
1500-lb Rectangular Baler	80,000	150	5	10	1.20	2.50	500	7,500	15.5		
2-tie Baler (PTO)	30,000	150	0	10	1.20	2.50	1,000	4,500	10.9		
14' Swather	80,000	200	0	10	1.10	3.20	1,920	20,000	6.8	Diesel	4.8
Balewagon, Small Bales	115,000	150	5	10	1.20	3.10	2,000	12,000	16.3	Diesel	4.0
Balewagon, Large Bales	115,000	150	5	10	1.20	3.10	2,000	12,000	27.2	Diesel	4.0
Manager's Pickup	30,000	18,000	0	7		6.80	600	15,000	18.0	Gasoline	12.0
Labor's Pickup	15,000	6,000	7	7		6.80	600	3,500	12.0	Gasoline	12.0

**Table 14. Per Acre Machine Costs (Calculated using the MachCost Calculator from the University of Idaho)**

Machine Combination	Depreciation (\$/acre)	Interest (\$/acre)	THI&L (\$/acre)	Total Fixed Costs (\$/acre)	Repairs (\$/acre)	Labor (\$/acre)	Fuel/Lube (\$/acre)	Total Variable Costs (\$/acre)	Total Costs (\$/acre)
Manager's Pickup	2.14	1.69	1.53	5.36	0.60	0.00	6.04	6.64	12.00
Labor's Pickup	3.28	1.39	1.26	5.93	1.20	0.00	4.02	5.22	11.15
250HP-WT, Disk & Pack	2.27	1.50	0.19	3.96	1.16	1.83	3.96	6.95	10.91
250HP-WT, Disk Ripper	3.12	2.09	0.26	5.47	1.76	2.77	5.97	10.50	15.97
150HP-WT, Seedbed Maker	2.09	1.35	0.17	3.61	0.93	2.44	3.12	6.49	10.10
150HP-WT, Disk Drill	4.19	2.55	0.72	7.46	2.24	4.00	4.67	10.91	18.37
150HP-WT, 20' Side Delivery Rake	1.43	0.93	0.12	2.48	0.47	2.06	2.73	5.26	7.74
150HP-WT, 1500-lb Baler	3.89	1.89	0.55	6.33	0.41	1.55	2.05	4.01	10.34
150HP-WT, 2-tie Baler	2.67	1.48	0.38	4.53	0.89	2.21	2.54	5.64	10.17
Balewagon, Small Bales	4.22	1.95	0.81	6.98	0.82	1.47	1.20	3.49	10.47
Balewagon, Large Bales	2.53	1.17	0.48	4.18	0.49	0.88	0.72	2.09	6.27
14' Swather	4.42	2.76	1.18	8.36	2.83	3.24	3.46	9.53	17.89