



University of Idaho Extension



Spring-planted annual forages in North Central Idaho.

Annual Forage Budgets for Northern Idaho: Small Square Baled

Assuming a 2500-acre farm

compiled by

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and

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University of Idaho

INSTRUCTIONS AND ASSUMPTIONS

General Instructions:

A color coding system is used to indicate the source of the data for each budget and to show which data can be adjusted. Numbers in red type can be changed without affecting the underlying equations in this cost calculator. Adjusting these numbers will automatically update calculations throughout the spreadsheet, which is very useful for sensitivity analyses.

Input Prices:

By entering input prices on the Input Prices sheet (click on the green Input Prices tab), all of the cost calculations will be automatically updated. Input cost changes can also be made on individual crop price sheets, over-riding the input cost formulae on that particular crop budget.

Machinery Costs:

The hourly machinery cost data are used to create the individualized machinery cost data for each budget. In the cover crop budget sheets, entries in blue cells are calculated by the machinery cost program and come from the associated Machinery Cost sheet for that crop. Machinery fixed costs include depreciation, interest, property taxes, insurance, and housing. For the overall farm operation, these costs do not vary by crop, given the ownership of a specific machinery complement, and are incurred whether or not crops are grown. Your per acre fixed costs will change if the farm size differs significantly from the size assumption used in these budgets.

General Assumptions:

Since farming is inherently variable and constantly changing, we hope that this spreadsheet format will be helpful in adjusting these budgets to reflect your particular operation. Enterprise costs and returns vary from one location to the next and over time for any particular farming operation.

Variability stems from differences in the following:

- Capital, labor, and natural resources
- Type and size of machinery complement
- Cultural practices
- Size of farm enterprise
- Input prices

Please examine closely the assumptions we have used and make adjustments to reflect your particular operation. Adjustments in the variable costs can easily be made without affecting the overall accuracy of the budget information. Machinery costs are more difficult to adjust, due to the underlying complexity of machinery cost calculations. A separate machinery cost calculator program is used to develop the costs used in these budgets, which are based on specific machinery widths, tractor horsepower, type of operation, etc. The machinery cost program and data sets specific to this budget are available upon request.

Annual Forage Considerations:

The annual forage crop enterprise budget produces the crops as small square bales. This production method was chosen because the USDA Hay Report tracks a nearby market of premium grass hay in small squares, providing a reliable source for pricing data. Data was normalized to match the common units in enterprise budgets. Since trial results were reported as dry matter above, the moisture content of dry matter weights was adjusted to 16% moisture as an average for baled hay. More moisture in the reported yields mean that the adjusted protein levels are lower since the protein weight is now part of a heavier moisture fraction. With the protein adjusted for 16% moisture baled hay, the protein differential between the annual forages and the USDA Premium Mead Grass market was used to determine prices for baled annual forage.

Acknowledgments:

These Budgets are developed using Excel form and machinery cost information from Kathleen Painter, PhD.

2020 Annual Forage Budgets for Northern Idaho: Small Square Baled
Summary of Gross Returns, Variable and Total Costs, and Returns to Risk (\$/acre/yr)

By Crop:	Yield (ton)	Price (per ton)	Protein %	Gross Returns (acre)	Total Variable Costs (ac)	Total Cost of Operation	Return to Risk (acre)
Otana Oat	3.46	\$140.46	8.3%	\$486	\$173	\$375	\$111
Proleaf 234 Forage Oats	3.32	\$140.46	8.3%	\$466	\$188	\$384	\$82
Everleaf 114 Forage Oats	3.11	\$147.23	8.7%	\$458	\$186	\$380	\$78
Proleaf 234 Oats & Flex Peas	3.11	\$152.31	9.0%	\$474	\$180	\$379	\$94
Everleaf 126 Forage Oats	3.08	\$140.46	8.3%	\$433	\$186	\$370	\$63

Input Prices		
<i>Note: Changing prices here will change them throughout the spreadsheet.</i>		
	Unit	2020 Price/unit
Fuel:		
Diesel (gal)	gal	\$2.55
Gas (gal)	gal	\$2.43
Pesticides:		
Ammonium Sulfate (liquid)	oz	\$0.01
2,4-D Amine	oz	\$0.14
Glyphosate	oz	\$0.13
M90	oz	\$0.22
MCPA Ester	oz	\$0.22
Custom Work:		
Haul and stack hay	ton	\$8.95
Labor:		
Hourly machine labor*	acre	\$20.00
Cash Rent:		
Cash Rent	acre	\$0.00
Overhead:		
	percent	5.00%
Interest:		
Operating Loan	percent	5.00%
Machinery Loan/investment	percent	5.75%
Fertilizer:		
Nitrogen, anhydrous	lb	\$0.59
Phosphorous (liquid)	lb	\$0.71
Sulfur (liquid)	lb	\$0.53
Potassium (dry)	lb	\$0.31

*Includes all applicable state and federal taxes.

Schedule of Operations for Direct Seeded Spring Cover Crop Blends, Northern Idaho

Month	Operation	Tooling	Materials/Service
April	Harrow	200HP-WT, 60' Harrow	
April	Spray Weeds	200HP-WT, 100' Sprayer	18 oz Roundup, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill*	450HP-WT, 36' Direct Seed Drill, Fertilizer Tanks & Pumps	Cover crop mix

Schedule of Operations for Direct Seeded Fall Cover Crop Blends, Northern Idaho

Month	Operation	Tooling	Materials/Service
April	Spray Weeds	200HP-WT, 100' Sprayer	18 oz Roundup, 50 oz Ammonium Sulfate, 1.5 oz M90
April	Drill*	450HP-WT, 36' Direct Seed Drill, Fertilizer Tanks & Pumps	Annual forage seed
May	Spray Broadleaf Weeds	105HP-CT, Side delivery rake	12 oz 2,4-D
July	Swath	105HP-CT, Mower/Conditioner	
		105HP-CT,	

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Otana Oats	3.46	ton	\$140.46	\$485.99
Variable Costs				
Seed:				
Otana Oats	80	lb	\$0.24	\$19.20
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	3.5	ton	\$8.95	\$30.97
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.46	ton	\$3.85	\$13.32
Operating Interest ¹				\$4.22
Total Variable Costs				\$172.97
Net Returns Above Variable Costs				\$313.02
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$127.34	\$127.34
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00
Overhead ²				\$8.00
Management fee ³				\$24.30
Total Fixed Costs				\$201.77
Total Costs per Acre				\$374.75
Total Costs per Unit				\$108.31
Returns to Risk				\$111.25



Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Legend: *Follow directions below to preserve equations in this spreadsheet.*

Purple: Data are from Summary page (purple tab).

Orange Type: You may adjust data in orange type & all other data will be updated.

Green: Data are from Input costs page (green tab).

Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Proleaf 234	3.32	ton	\$140.46	\$466.33
Variable Costs				
Seed:				\$36.00
Proleaf 234	80	lb	\$0.45	\$36.00
Fertilizer:				\$63.15
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				\$6.00
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				\$36.11
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				\$29.71
Custom Haul and Stack	3.3	ton	\$8.95	\$29.71
Other:				\$12.78
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.32	ton	\$3.85	\$12.78
Operating Interest ¹				\$4.59
Total Variable Costs				\$188.35
Net Returns Above Variable Costs				\$277.97
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$121.26	\$121.26
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$9.00
Management fee ³	\$23.32
Total Fixed Costs	\$195.72
Total Costs per Acre	\$384.07
Total Costs per Unit	\$115.68
Returns to Risk	\$82.26

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	3.0	3.32	3.7
Operating Cost Breakeven	\$63.04	\$56.73	\$51.58
Ownership Cost Breakeven	\$65.50	\$58.95	\$53.59
Total Cost Breakeven	\$128.54	\$115.68	\$105.17
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$126.41	\$140.46	\$154.51
Operating Cost Breakeven	1.49	1.34	1.22
Ownership Cost Breakeven	1.55	1.39	1.27
Total Cost Breakeven	3.04	2.73	2.49

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Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Everleaf 114	3.11	ton	\$147.23	\$457.89
Variable Costs				
Seed:				
Everleaf 114	80	lb	\$0.46	\$36.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	3.1	ton	\$8.95	\$27.83
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.11	ton	\$3.85	\$11.97
Operating Interest ¹				\$4.55
Total Variable Costs				\$186.42
Net Returns Above Variable Costs				\$271.47
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$119.10	\$119.10
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$9.00
Management fee ³	\$22.89
Total Fixed Costs	\$193.13
Total Costs per Acre	\$379.55
Total Costs per Unit	\$122.04
Returns to Risk	\$78.34

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-		+
	10%	Base Yield	10%
<u>Price</u>	2.8	3.11	3.4
Operating Cost Breakeven	\$66.60	\$59.94	\$54.49
Ownership Cost Breakeven	\$69.00	\$62.10	\$56.45
Total Cost Breakeven	\$135.60	\$122.04	\$110.95
	-		+
	10%	Base Price	10%
<u>Yield</u>	\$132.51	\$147.23	\$161.95
Operating Cost Breakeven	1.41	1.27	1.15
Ownership Cost Breakeven	1.46	1.31	1.19
Total Cost Breakeven	2.86	2.58	2.34

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Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Proleaf 234-Flex	3.11	ton	\$152.31	\$473.68
Variable Costs				
Seed:				
Proleaf 234-Flex	80	lb	\$0.38	\$30.40
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
MCPA Amine	12	oz	\$0.22	\$2.69
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	3.1	ton	\$8.95	\$27.83
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.11	ton	\$3.85	\$11.97
Operating Interest ¹				\$4.40
Total Variable Costs				\$180.32
Net Returns Above Variable Costs				\$293.36
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$124.16	\$124.16
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$9.00
Management fee ³	\$23.68
Total Fixed Costs	\$198.98
Total Costs per Acre	\$379.31
Total Costs per Unit	\$121.96
Returns to Risk	\$94.38

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	2.8	3.11	3.4
Operating Cost Breakeven	\$64.42	\$57.98	\$52.71
Ownership Cost Breakeven	\$71.09	\$63.98	\$58.16
Total Cost Breakeven	\$135.51	\$121.96	\$110.88

	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$137.08	\$152.31	\$167.54
Operating Cost Breakeven	1.32	1.18	1.08
Ownership Cost Breakeven	1.45	1.31	1.19
Total Cost Breakeven	2.77	2.49	2.26

Legend: *Follow directions below to preserve equations in this spreadsheet.*

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Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Everleaf 126	3.08	ton	\$140.46	\$432.62
Variable Costs				
Seed:				
Everleaf 126	80	lb	\$0.46	\$36.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	3.1	ton	\$8.95	\$27.57
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.08	ton	\$3.85	\$11.86
Operating Interest ¹				\$4.54
Total Variable Costs				\$186.02
Net Returns Above Variable Costs				\$246.59
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$110.85	\$110.85
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$9.00
Management fee ³	\$21.63
Total Fixed Costs	\$183.61
Total Costs per Acre	\$369.64
Total Costs per Unit	\$120.01
Returns to Risk	\$62.98

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	2.8	3.08	3.4
Operating Cost Breakeven	\$67.11	\$60.40	\$54.91
Ownership Cost Breakeven	\$66.24	\$59.62	\$54.20
Total Cost Breakeven	\$133.35	\$120.01	\$109.10

	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$126.41	\$140.46	\$154.51
Operating Cost Breakeven	1.47	1.32	1.20
Ownership Cost Breakeven	1.45	1.31	1.19
Total Cost Breakeven	2.92	2.63	2.39

Legend: *Follow directions below to preserve equations in this spreadsheet.*

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Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
Stockford Barley	2.76	ton	\$137.08	\$378.34
Variable Costs				
Seed:				
Stockford Barley	80	lb	\$0.30	\$24.00
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	2.8	ton	\$8.95	\$24.70
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	2.76	ton	\$3.85	\$10.63
Operating Interest ¹				\$4.11
Total Variable Costs				\$168.71
Net Returns Above Variable Costs				\$209.63
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$93.88	\$93.88
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$8.00
Management fee ³	\$18.92
Total Fixed Costs	\$162.94
Total Costs per Acre	\$331.64
Total Costs per Unit	\$120.16
Returns to Risk	\$46.70

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
<u>Price</u>	2.5	2.76	3.0
Operating Cost Breakeven	\$67.92	\$61.13	\$55.57
Ownership Cost Breakeven	\$65.59	\$59.03	\$53.67
Total Cost Breakeven	\$133.51	\$120.16	\$109.24
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$123.37	\$137.08	\$150.79
Operating Cost Breakeven	1.37	1.23	1.12
Ownership Cost Breakeven	1.32	1.19	1.08
Total Cost Breakeven	2.69	2.42	2.20

Legend: *Follow directions below to preserve equations in this spreadsheet.*

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Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
NZA 4.14 Forage Oats	2.72	ton	\$145.54	\$395.87
Variable Costs				
Seed:				
NZA 4.14 Forage Oats	80	lb	\$0.46	\$36.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
2,4-D Amine	16	oz	\$0.14	\$2.24
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	2.7	ton	\$8.95	\$24.34
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	2.72	ton	\$3.85	\$10.47
Operating Interest ¹				\$4.42
Total Variable Costs				\$181.30
Net Returns Above Variable Costs				\$214.57
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$99.78	\$99.78
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$9.00
Management fee ³	\$19.79
Total Fixed Costs	\$170.71
Total Costs per Acre	\$352.02
Total Costs per Unit	\$129.42
Returns to Risk	\$43.85

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	2.4	2.72	3.0
Operating Cost Breakeven	\$74.06	\$66.65	\$60.60
Ownership Cost Breakeven	\$69.74	\$62.76	\$57.06
Total Cost Breakeven	\$143.80	\$129.42	\$117.65

	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$130.99	\$145.54	\$160.09
Operating Cost Breakeven	1.38	1.25	1.13
Ownership Cost Breakeven	1.30	1.17	1.07
Total Cost Breakeven	2.69	2.42	2.20

Legend: *Follow directions below to preserve equations in this spreadsheet.*

Purple: Data are from Summary page (purple tab).

Orange Type: You may adjust data in orange type & all other data will be updated.

Green: Data are from Input costs page (green tab).

Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
<u>Stockford - Flex</u>	2.62	ton	\$140.46	\$368.01
Variable Costs				
Seed:				
<u>Stockford - Flex</u>	80	lb	\$0.36	\$28.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
MCPA Amine	12	oz	\$0.22	\$2.69
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	2.6	ton	\$8.95	\$23.45
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	2.62	ton	\$3.85	\$10.09
Operating Interest ¹				\$4.20
Total Variable Costs				\$172.25
Net Returns Above Variable Costs				\$195.75
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$90.73	\$90.73
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			
Cash Rent				\$0.00

Overhead ²	\$8.00
Management fee ³	\$18.40
Total Fixed Costs	\$159.27
Total Costs per Acre	\$331.53
Total Costs per Unit	\$126.54
Returns to Risk	\$36.48

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	-	Base	+
	10%	Yield	10%
<u>Price</u>	2.4	2.62	2.9
Operating Cost Breakeven	\$73.05	\$65.75	\$59.77
Ownership Cost Breakeven	\$67.55	\$60.79	\$55.26
Total Cost Breakeven	\$140.60	\$126.54	\$115.03
	-	Base	+
	10%	Price	10%
<u>Yield</u>	\$126.41	\$140.46	\$154.51
Operating Cost Breakeven	1.36	1.23	1.11
Ownership Cost Breakeven	1.26	1.13	1.03
Total Cost Breakeven	2.62	2.36	2.15

Legend: *Follow directions below to preserve equations in this spreadsheet.*

Purple: Data are from Summary page (purple tab).

Orange Type: You may adjust data in orange type & all other data will be updated.

Green: Data are from Input costs page (green tab).

Blue: Data are from the Machinery page (blue tab).

Production Costs for Annual Forage Crops, Northern Idaho

Item	Quantity Per Acre	Unit	Price or Cost/Unit	Value or Cost/Acre
Gross Returns				
<u>Average</u>	3.02	ton	\$143.00	\$431.86
Variable Costs				
Seed:				
<u>Average Seed Cost</u>	80	lb	\$0.36	\$28.80
Fertilizer:				
<i>Base your rate on your soil test results.</i>				
<i>A typical recommendation might include the following:</i>				
Nitrogen	80	lb	\$0.59	\$47.20
Phosphorous	15	lb	\$0.71	\$10.65
Sulfur	10	lb	\$0.53	\$5.30
Pesticides:				
<i>Rates & 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>				
Roundup	22	oz	\$0.13	\$2.86
Ammonium Sulfate (liquid)	50	oz	\$0.01	\$0.57
M90	1.5	oz	\$0.22	\$0.33
M90	1.5	oz	\$0.22	\$0.34
MCPA Amine	12	oz	\$0.00	\$0.00
Machinery:				
Fuel	3.57	gal	\$2.55	\$9.11
Lubricants	1	acre	\$1.31	\$1.31
Machinery Repairs	1	acre	\$11.76	\$11.76
Machinery Labor	0.70	hour	\$20.00	\$13.93
Custom & Consultants:				
Custom Haul and Stack	3.0	ton	\$8.95	\$27.03
Other:				
Crop insurance	1	acre	\$0.00	\$0.00
Baling Twine	3.02	ton	\$3.85	\$11.63
Operating Interest ¹				\$4.27
Total Variable Costs				\$175.09
Net Returns Above Variable Costs				\$256.77
Ownership Costs:				
Machinery depreciation		acre	\$22.37	\$22.37
Machinery interest on investment		acre	\$15.16	\$15.16
Machinery taxes, insurance, housing, licenses		acre	\$4.61	\$4.61
Land Cost		acre	\$111.40	\$111.40
<i>*Based on share rent percentage:</i>				
Landlord	33%			
Tenant	67%			

Cash Rent	\$0.00
Overhead ²	\$9.00
Management fee ³	\$21.59
Total Fixed Costs	\$184.13
Total Costs per Acre	\$359.22
Total Costs per Unit	\$118.95
Returns to Risk	\$72.64

Notes:

¹Calculated as 5.75% interest on operating capital for 6 months.

²Covers legal, accounting, and utility fees. Calculated as 2.5% of operating expenses.

³The management fee is calculated as a 5% of gross revenue.

Breakeven Analysis:

	- 10%	Base Yield	+ 10%
<u>Price</u>	2.7	3.02	3.3
Operating Cost Breakeven	\$64.42	\$57.98	\$52.71
Ownership Cost Breakeven	\$67.75	\$60.97	\$55.43
Total Cost Breakeven	\$132.16	\$118.95	\$108.13
	- 10%	Base Price	+ 10%
<u>Yield</u>	\$128.70	\$143.00	\$157.30
Operating Cost Breakeven	1.36	1.22	1.11
Ownership Cost Breakeven	1.43	1.29	1.17
Total Cost Breakeven	2.79	2.51	2.28

Machinery Costs (\$/acre) from the University of Idaho Machinery Cost Calculator

Note: Per hour machinery costs can be changed in this master table and they will update throughout. Per acre costs are calculated in the Machine Cost program using the values listed in the Machinery Complement tab. You can also delete or insert lines in the individual crop machinery cost tables and the budget amounts will be recalculated.

	Fixed Costs (\$/acre):				Variable Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance,	Total Fixed Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	
200HP Trac+Bankout Wagon	\$1.45	\$1.24	\$0.23	\$2.93	\$0.67	\$1.40	\$0.21	\$2.28	\$1.76	0.09	0.55	\$6.97
200HP Trac+60'Harrow	\$0.48	\$0.41	\$0.07	\$0.96	\$0.23	\$0.40	\$0.06	\$0.69	\$0.51	0.03	0.16	\$2.16
200HP Trac+100'Sprayer	\$0.61	\$0.51	\$0.08	\$1.20	\$0.46	\$0.34	\$0.05	\$0.85	\$0.43	0.02	0.13	\$2.48
Fertilizer Tanks+Pumps	\$1.02	\$0.59	\$0.06	\$1.67	\$0.68	\$0.00	\$0.00	\$0.68	\$0.00	0.00	0.00	\$2.35
450HP Tractor+NT Drill, 36'	\$5.27	\$4.23	\$1.57	\$11.07	\$2.79	\$2.68	\$0.40	\$5.87	\$1.49	0.07	1.05	\$18.43
Combine + 36' Header	\$6.85	\$3.94	\$1.78	\$12.57	\$2.91	\$2.16	\$0.32	\$5.39	\$1.93	0.10	0.85	\$19.89
Pickup 3/4 ton 4WD	\$0.88	\$0.62	\$0.73	\$2.23	\$0.24	\$0.80	\$0.12	\$1.16	\$0.00	0.00	0.23	\$3.39
Tandem Axle Truck	\$0.64	\$0.64	\$1.13	\$2.41	\$0.80	\$1.00	\$0.15	\$1.95	\$3.60	0.18	0.39	\$7.96
Tandem Axle Truck	\$0.64	\$0.78	\$1.13	\$2.55	\$0.80	\$1.50	\$0.22	\$2.52	\$3.60	0.18	0.59	\$8.67
Trap Wagon	\$0.48	\$0.25	\$0.17	\$0.90	\$0.40	\$0.04	\$0.01	\$0.45	\$0.24	0.01	0.01	\$1.59
4WD-ATV	\$0.20	\$0.14	\$0.03	\$0.37	\$0.08	\$0.17	\$0.03	\$0.27	\$1.32	0.07	0.05	\$1.96
50HP Wheel Tractor	\$0.30	\$0.27	\$0.06	\$0.62	\$0.08	\$0.26	\$0.04	\$0.38	\$1.32	0.07	0.10	\$2.32
Total:	\$18.82	\$13.62	\$7.04	\$39.48	\$10.14	\$10.75	\$1.61	\$22.49	\$16.20	0.81	4.11	\$78.17

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.

Machinery Costs for No-Till Annual Forages (\$/acre) from the University of Idaho Machinery Cost Calculator

	Fixed Costs (\$/acre):				Variable Costs (\$/acre):				Labor		Fuel Use	Total Cost (\$/acre)
	Depreciation	Interest	Taxes, Housing, Insurance,	Total Fixed Costs	Repairs	Fuel	Lubricants	Total	(\$/acre)	(hr/acre)	(gal/acre)	

Annual costs:

Pickup 3/4 ton 4WD	\$0.88	\$0.62	\$0.73	\$2.23	\$0.24	\$0.80	\$0.12	\$1.16	\$0.00	\$0.00	\$0.23	\$3.39
Trap Wagon	\$0.48	\$0.25	\$0.17	\$0.90	\$0.40	\$0.04	\$0.01	\$0.45	\$0.24	\$0.01	\$0.01	\$1.59
4WD-ATV	\$0.20	\$0.14	\$0.03	\$0.37	\$0.08	\$0.17	\$0.03	\$0.27	\$1.32	\$0.07	\$0.05	\$1.96
50HP Wheel Tractor	\$0.30	\$0.27	\$0.06	\$0.62	\$0.08	\$0.26	\$0.04	\$0.38	\$1.32	\$0.07	\$0.10	\$2.32

Seasonal operations:

200HP Trac+60'Harrow	\$0.48	\$0.41	\$0.07	\$0.96	\$0.23	\$0.40	\$0.06	\$0.69	\$0.51	0.03	0.16	\$2.16
200HP Trac+100'Sprayer	\$0.61	\$0.51	\$0.08	\$1.20	\$0.46	\$0.34	\$0.05	\$0.85	\$0.43	0.02	0.13	\$2.48
450HP Tractor+NT Drill, 36'	\$5.27	\$4.23	\$1.57	\$11.07	\$2.79	\$2.68	\$0.40	\$5.87	\$1.49	0.07	1.05	\$18.43
Fertilizer Tanks+Pumps	\$1.02	\$0.59	\$0.06	\$1.67	\$0.68	\$0.00	\$0.00	\$0.68	\$0.00	0.00	0.00	\$2.35
200HP Trac+100'Sprayer	\$0.61	\$0.51	\$0.08	\$1.20	\$0.46	\$0.34	\$0.05	\$0.85	\$0.43	0.02	0.13	\$2.48
105HP-WT + 16 x 18 Baler	\$5.52	\$3.01	\$0.81	\$9.33	\$2.84	\$1.84	\$0.17	\$4.85	\$2.05	\$0.13	0.53	\$16.24
105HP-WT + Mower/Conditioner	\$5.29	\$3.23	\$0.79	\$9.30	\$2.89	\$2.77	\$0.25	\$5.91	\$3.07	\$0.19	0.79	\$18.29
105HP-WT Hay Rake Costs	\$1.71	\$1.40	\$0.17	\$3.28	\$0.62	\$1.38	\$0.13	\$2.13	\$1.53	\$0.09	0.40	\$6.94
Total:	\$22.37	\$15.16	\$4.61	\$42.14	\$11.76	\$11.02	\$1.31	\$24.09	\$12.40	\$0.70	3.57	\$78.62

Machinery Costs

Annual Forage Budgets for Northern Idaho

10/9/2021

Machinery Complement for Direct Seed Planting, Over 18" Precipitation, Northern Idaho										
Type of Machine	Replacement Value \$	Age When Purchased	Years of Life	Annual Hours of Use	Salvage Value \$	Annual Repairs (Materials & Labor) \$	Gallons of Fuel/Hr.	Taxes, Housing, Insur., Licenses %	Labor Multiplier	Acres per Hour
<i>Tractors, ATVs:</i>										
4WD-ATV	8,500	0	10	150	3,500	200	1.2	1.2	1.1	
50HP-WT w/Bucket	16,000	5	20	150	3,500	300	3	1.2	1.1	
200HP FWA Tractor	95,000	5	15	300	35,000	1000	9	1.2	1.1	
450HP 4WD Tractor	180,000	10	10	250	80,000	4,000	20	1.2	1.25	
105HP-CT	60,000	0	20	300	7,700	1,000	4.6	1.1	1.1	
<i>Equipment:</i>										
Bankout Wagon	18,000	0	15	200	3,500	1000	9	0.6	1.1	-
100' Pull Sprayer	42,000	0	20	200	6,000	2000	9	0.6	1.2	51
60' Harrow	12,000	5	15	75	1,000	500	9	0.6	1.1	37
30' Shredder	30,000	0	10	115	5,500	2000	9	2.5	1.2	16
Fertilizer Tanks & Pump	30,000	0	20	-	-	1000	-	-	-	-
36' NT Drill	150,000	6	10	200	75,000	5,000	20	3	1.25	15
36' Combine	300,000	2	10	225	100,000	8,500	14	2.6	1.25	13
Hay baler 16 x 18	30,000	5	10	75	2,500	1,500	4.6	2.5	1.2	4.36
Mower/conditioner	18,000	5	10	80	1,800	1,000	4.6	2.5	1.2	5.82
Hay rake	5,000	5	15	60	500	100	4.6	0.6	1.1	11.64
<i>Trucks:</i>										
				Miles/year:			MPG:			
Tandem Axle Truck	40,000	10	15	7,500	16,000	2,000	6	10.1	1.2	
Tandem Axle Truck	40,000	10	15	7,500	16,000	2,000	6	10.1	1.2	
Trap Wagon	17,000	10	10	500	5,000	1000	12	3.8	1.2	
3/4T 4WD Pickup	38,000	0	10	15,000	16,000	600	12	6.8	1.2	

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.