



Guidelines for Estimating Silage Production Costs 2018

in Manitoba



Guidelines For Estimating Silage Production Costs - 2018

Date: January, 2018

This guide is designed to provide planning information and a format for calculating the costs of producing barley, corn and alfalfa grass silage for the purpose of feeding livestock in Manitoba. General Manitoba Agriculture recommendations are assumed in using fertilizers and chemical inputs. These figures provide an economic evaluation of the crops and estimated yields required to cover all costs. Costs include labour, investment and depreciation, but do not include management costs, nor do they necessarily represent the average cost of production in Manitoba.

The assumptions on which the costs were calculated are clearly defined in the supporting pages. They were developed using a combination of recommended practices and methods followed by many producers. The major advantage of silage is that the crop can be harvested when it is ready in almost all weather conditions. Since there are fewer harvesting losses, more nutrients are harvested per acre compared with most other systems. Ensiling permits the use of a wider range of crops including grasses, legumes, grains, corn and miscellaneous salvage crops that have suffered weather damage or weed infestation. The major disadvantages of silage compared with hay is that it requires more capital investment and labour. Also, silage has limited market potential, because trucking costs limit distance to market, it must be produced near the location where it will be fed.

These budgets may be adjusted by putting in your own figures. As a producer, you are encouraged to calculate your own costs of production for your silage crops. On each farm, costs and yields differ due to soil type, climate and agronomic practices.

This tool is available as an Excel worksheet at: www.manitoba.ca/agriculture
or at your local [Manitoba Agriculture Office](#).
[The Farm Machinery Custom and Rental Rate Guide](#) is also available to help determine machinery costs.

Note: This budget is only a guide and is not intended as an in depth study of the cost of production of this industry. Interpretation and use of this information is the responsibility of the user. If you need help with a budget, contract your local Manitoba Agriculture office.

Silage Production Cost Summary - 2018								
	Barley Silage		Corn Silage		Alfalfa-Grass Silage			Your Farm
	Annual		Annual		Year 1 Forage	Annual (Years 2 to 8)		
	Production Costs		Production Costs		Establishment ¹	Production Costs		
	\$/acre	\$/wet ton	\$/acre	\$/wet ton	\$/acre	\$/acre	\$/wet ton	
A. Operating Costs								
Seed & Treatment	\$16.88	\$2.25	\$89.60	\$6.40	\$36.00	-	-	
Nurse Crop Seed	-	-	-	-	\$8.75	-	-	
Establishment (amortized)	-	-	-	-	-	\$26.81	\$4.92	
Fertilizer	\$48.55	\$6.47	\$91.66	\$6.55	\$60.69	\$41.28	\$7.57	
Herbicide/Insecticide	\$12.00	\$1.60	\$12.00	\$0.86	\$25.00	\$0.00	\$0.00	
Field Fuel Costs	\$12.97	\$1.73	\$13.19	\$0.94	\$17.39	\$9.46	\$1.74	
Moving Fuel Costs	\$2.17	\$0.29	\$4.06	\$0.29	\$1.02	\$1.58	\$0.29	
Packing Fuel Costs	\$2.13	\$0.28	\$3.97	\$0.28	\$1.00	\$1.54	\$0.28	
Machinery Operating	\$15.00	\$2.00	\$15.00	\$1.07	\$15.00	\$15.00	\$2.75	
Machinery Lease	\$4.80	\$0.64	\$4.80	\$0.34	\$4.80	\$4.80	\$0.88	
Crop Insurance	\$11.84	\$1.58	\$14.44	\$1.03	\$5.34	\$5.76	\$1.06	
Miscellaneous	\$7.50	\$1.00	\$8.50	\$0.61	\$5.00	\$5.00	\$0.92	
Land Taxes	\$10.00	\$1.33	\$10.00	\$0.71	\$10.00	\$10.00	\$1.83	
Rental & Custom Costs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
Interest on Operating	\$3.60	\$0.48	\$6.68	\$0.89	\$4.75	\$3.03	\$0.56	
Total Operating	\$147.44	\$19.66	\$273.89	\$19.98	\$194.74	\$124.27	\$22.80	
B. Fixed Costs								
Depreciation								
Machinery Depreciation	\$37.50	\$5.00	\$37.50	\$2.68	\$37.50	\$37.50	\$6.88	
Bunker Storage	\$3.33	\$0.44	\$5.00	\$0.36	\$3.33	\$3.33	\$0.61	
Investment								
Land Investment Costs	\$50.82	\$6.78	\$50.82	\$3.63	\$50.82	\$50.82	\$9.32	
Machinery Investment	\$10.31	\$1.38	\$10.31	\$0.74	\$10.31	\$10.31	\$1.89	
Bunker Storage	\$0.46	\$0.06	\$0.69	\$0.05	\$0.46	\$0.46	\$0.08	
Total Fixed	\$102.42	\$13.66	\$104.32	\$7.45	\$102.42	\$102.42	\$18.79	
Total Operating & Fixed	\$249.86	\$33.31	\$378.21	\$27.43	\$297.16	\$226.69	\$41.59	
C. Labour	\$30.64	\$4.09	\$45.82	\$3.27	\$30.64	\$18.14	\$3.33	
Total Costs	\$280.50	\$37.40	\$424.03	\$30.70	\$327.80	\$244.83	\$44.92	
Profitability & Breakeven Analysis								
Estimated Farmgate								
Price \$ per ton	\$40.80		\$32.00		\$39.81	\$39.81		
Yield per acre (ton)	7.50		14.00		3.52	5.45		
Gross Revenue	\$306.00		\$448.00		\$140.12	\$216.94		
Marginal Returns								
Over Operating Costs	\$158.56	\$21.14	\$174.11	\$12.02	(\$54.62)	\$92.67	\$17.00	
Over Total Costs (Net Profit)	\$25.50	\$3.40	\$23.97	\$1.30	(\$187.68)	(\$27.89)	(\$5.11)	
Operating Expense Ratio	48.2%		61.1%		139.0%	57.3%		
Breakeven Price Per Ton								
Operating Costs		\$19.66		\$19.98			\$22.80	
Total Costs		\$37.40		\$30.70			\$44.92	
Breakeven Yield (tons per acre)								
Operating Costs		3.6		8.6			3.1	
Total Costs		6.9		13.3			6.2	
TDN & Crude Protein Cost Analysis								
Cost of TDN (\$ per pound DM)	\$0.081		\$0.083				\$0.086	
Cost of Crude Protein (\$ per pound DM)	\$0.458		\$0.613				\$0.356	

1. Alfalfa-grass establishment (with oat silage nurse crop) net cost of \$187.68 (total cost minus estimated gross revenue) were amortized over 7 silage production years.

Note: This budget is only a guide and is not intended as an in depth study of the cost of production of this industry. Interpretation and utilization of this information is the responsibility of the user.

Risk & Sensitivity Analysis (Stress Test)

	Barley Silage		Corn Silage		Alfalfa Grass Silage	
	Cost/ Acre	Cost/ Ton Wet	Cost/ Acre	Cost/ Ton Wet	Cost/ Acre	Cost/ Ton Wet
A. Operating Costs	\$147.44	\$19.66	\$273.89	\$19.98	\$124.27	\$22.80
B. Fixed Costs	\$102.42	\$13.66	\$104.32	\$7.45	\$102.42	\$18.79
C. Labour	\$30.64	\$4.09	\$45.82	\$3.27	\$18.14	\$3.33
Total Cost of Production	\$280.50	\$37.40	\$424.03	\$30.70	\$244.83	\$44.92
Estimated yield per acre (wet tons)		7.50		14.0		5.45
Cost of TDN (\$ per pound)		\$0.081		\$0.083		\$0.086
Cost of Crude Protein (\$ per pound)		\$0.458		\$0.613		\$0.356

Percent Silage Yield Change -10%

	Barley Silage	Corn Silage	Alfalfa Grass Silage
Silage Yield (tons per acre)	6.75	12.60	5.45
Stress Test Scenario = Silage Yield Down 10%			
Cost per ton	\$41.56	\$33.65	\$44.92
Cost of TDN (\$ per pound)	\$0.090	\$0.090	\$0.086
Cost of Crude Protein (\$ per pound)	\$0.509	\$0.672	\$0.356

Forage Cost Comparison Analysis

	Barley Silage	Corn Silage	Alfalfa Grass Silage
Cost of Silage (\$/wet ton)	\$37.40	\$30.70	\$44.92
Equivalent Dry Hay Value (TDN Basis) for Breakeven Purchase Decision:			
Alfalfa/Grass - 12.6% H ₂ O, 60% TDN	(\$/ton) \$84.86	\$86.53	\$90.28
	(\$/lb) \$0.042	\$0.043	\$0.045
Alfalfa - 12.1% H ₂ O, 61.5%TDN	(\$/ton) \$87.48	\$89.20	\$93.06
	(\$/lb) \$0.044	\$0.045	\$0.047
Equivalent Dry Hay Value (CP Basis) for Breakeven Purchase Decision:			
Alfalfa/Grass - 12.6% H ₂ O, 14% CP	(\$/ton) \$112.03	\$149.92	\$87.15
	(\$/lb) \$0.056	\$0.075	\$0.044
Alfalfa - 12.1% H ₂ O, 18.2% CP	(\$/ton) \$146.47	\$196.01	\$113.94
	(\$/lb) \$0.073	\$0.098	\$0.057

Note: This budget is only a guide and is not intended as an in depth study of the cost of production of this industry. Interpretation and utilization of this information is the responsibility of the user.

Estimated Yield of Silage - Wet Tons per Acre ¹

<u>Years</u>	<u>Barley tons/acre</u>	<u>Corn tons/acre</u>	<u>Alfalfa-Grass tons/acre</u>	
1	7.50	14.00	3.52	(establishment year)
2	-	-	6.27	
3	-	-	6.27	
4	-	-	5.87	
5	-	-	5.48	
6	-	-	5.09	
7	-	-	4.70	
8	-	-	4.50	
9	-	-		
10	-	-		
Total Yield	-	-	38.2	
Average Yield	7.50	14.00	5.45	
Years Production	1	1	7	
Years Rotation	1	1	8	

1. Users are reminded to adjust fertilizer rates when making changes to forage yields.

Silage Forage Analysis

	<u>Barley</u>	<u>Corn</u>	<u>Alfalfa-Grass</u>
Crude protein DM (CP)%	11.1	8.7	14.6
Energy DM (TDN) %	62.8	64.6	60.4
As fed moisture %	63.2	71.2	56.8

Silage Price Formula

	<u>Barley</u>	<u>Corn</u>	<u>Alfalfa-Grass</u>
Grain price (per bushel)	\$3.40	\$4.00	-
Dry Hay price (\$ per ton)	-	-	\$80.00
Silage Price Factor	12.00	8.00	0.4976
Silage (\$ per wet ton)	\$40.80	\$32.00	\$39.81

Forage Value Comparison (Feed Analysis)

	<u>Alfalfa/Grass Hay</u>	<u>Alfalfa Hay</u>
Crude Protein feed analysis %	14.0	18.2
TDN feed analysis %	60.0	61.5
Moisture content %	12.6	12.1

Seed & Treatment

<u>Crop</u>	<u>Seeding Rate</u> <u>per Acre</u>	<u>Price</u> <u>per Unit</u>	<u>Cost</u> <u>per Acre</u>
Cereal Silage			
Barley	2.25 bu	\$7.50 /bu	\$16.88
Corn	32,000 plants	\$0.00280 /plant	\$89.60
Alfalfa-Grass Silage			
Alfalfa-grass	10 lb	\$3.60 /lb	\$36.00
Oat nurse crop (silage)	1.25 bu	\$7.00 /bu	\$8.75

Fertilizer ¹

<u>Fertilizer Type</u>	<u>Bulk Price</u> <u>\$/tonne</u>	<u>Actual Nutrient</u> <u>\$/lb</u>	<u>Nitrogen</u> <u>Usage</u>	<u>Sulphur</u> <u>Usage</u>
Nitrogen: (urea) 46-0-0	\$440	\$0.434	100%	-
Nitrogen: (NH3) 82-0-0	\$623	\$0.345	0%	-
Nitrogen: (liquid) 28-0-0	\$283	\$0.458	0%	-
Phosphorus: 11-52-0	\$634	\$0.461	-	-
Potash: 0-0-60	\$415	\$0.314	-	-
Sulphur: 20.5-0-0-24	\$426	\$0.435	-	100%
MES S15: 13-33-0-15	\$642	\$0.551	-	0%

Amount of Actual Pounds of Elements Applied Per Acre

<u>Crop</u>	<u>Nitrogen</u>		<u>Phosphorus</u>		<u>Potash</u>		<u>Sulphur</u>		<u>Total</u> <u>\$/acre</u>
	<u>lbs</u>	<u>\$/acre</u>	<u>lbs</u>	<u>\$/acre</u>	<u>lbs</u>	<u>\$/acre</u>	<u>lbs</u>	<u>\$/acre</u>	
Cereal Silage									
Barley	80	\$34.71	30	\$13.84	0	\$0.00	0	\$0.00	\$48.55
Corn	130	\$56.40	50	\$23.06	25	\$7.84	10	\$4.35	\$91.66
Alfalfa-Grass Silage									
Alfalfa-grass	0	\$0.00	40	\$18.45	52	\$16.31	15	\$6.52	\$41.28
Oat nurse crop (silage)	50	\$21.69	50	\$23.06	30	\$9.41	15	\$6.52	\$60.69

The fertilizer recommendation will vary depending on the soil type, climate and crop rotation. Manitoba Agriculture recommends that soil test sampling and analysis be conducted each year to produce a better baseline for fertility. On many Manitoba soil types, potash application can be reduced based on soil test results. Custom soil sampling and analysis typically costs \$1.00 to \$2.00/acre.

1. Users are reminded to adjust silage yields when making changes to fertilizer rates.

Chemicals

<u>Crop</u>	<u>Weed</u> <u>Control</u> <u>\$/acre</u>	<u>Insect</u> <u>Control</u> <u>\$/acre</u>	<u>Forage</u> <u>Removal</u> <u>\$/acre</u>	<u>Total</u> <u>Cost</u> <u>\$/acre</u>
Cereal Silage				
Barley	\$12.00	\$0.00		\$12.00
Corn	\$12.00	\$0.00		\$12.00
Alfalfa-Grass Silage				
Alfalfa-grass	\$0.00	\$0.00		\$0.00
Oat nurse crop (silage)	\$15.00	\$0.00	\$10.00	\$25.00

Operating Costs

Interest Rate on Operating Silage machinery repair	5.00% 4.00% (% of total investment)
Land Taxes (\$/acre)	\$10.00
Fuel Cost (\$/litre)	\$0.85
Labour Cost per Hour	\$20.00

	Barley		Corn		Alfalfa Grass Silage	
	<u>Silage</u>	<u>Silage</u>	<u>Establishment</u>	<u>Production</u>	<u>Establishment</u>	<u>Production</u>
Field Fuel Cost (\$/acre)	\$12.97	\$13.19	\$17.39	\$9.46		
Moving Fuel Cost						
Truck capacity (tons)	20	20	20	20		
Fuel Use (miles/gal)	2	2	2	2		
Distance to storage (miles)	3	3	3	3		
Total (\$/acre)	\$2.17	\$4.06	\$1.02	\$1.58		
Packing Fuel Cost						
Tons per hour	45	45	45	45		
Fuel Consumption (litres/hour)	15	15	15	15		
Total (\$/acre)	\$2.13	\$3.97	\$1.00	\$1.54		
Crop Insurance ¹ (\$/acre)	\$11.84	\$14.44	\$5.34	\$5.76		
Other Costs (\$/acre)	\$7.50	\$8.50	\$5.00	\$5.00		
Rental and Custom Work						
Seeding/Planting (\$/acre)	\$0.00	\$0.00	\$0.00	-		
Application (\$/acre)	\$0.00	\$0.00	\$0.00	\$0.00		
Silage Harvesting (\$/acre)	\$0.00	\$0.00	\$0.00	\$0.00		
General (\$/acre)	\$0.00	\$0.00	\$0.00	\$0.00		
Total (\$/acre)	\$0.00	\$0.00	\$0.00	\$0.00		

¹Crop insurance: (2017 rates)

Alfalfa grass establishment Insurance for \$80/ac coverage.
Annual Insurance for 80% Select Hay coverage in MASC (FA 6) with LTAY alfalfa grass <= 4 years, yield 1.861 tons/acre (3.77 tons/acre wet silage).
Annual Insurance for 80% coverage in MASC Risk Area#14 for Corn Silage and Greenfeed, and \$160/ac hail coverage.

Labour Hours per Acre					# Hired	# of	Acres	Hours
					Staff	Months	Farmed	Per Acre
Cropping	0.875	1.131	0.875	0.250	1	4	300	2.13
Swathing	0.125	0.000	0.125	0.125	2	0.5	300	0.53
Forage Harvest	0.133	0.200	0.133	0.133	0	0	300	0.00
Trucking	0.266	0.640	0.266	0.266	0	0	300	0.00
Packing	0.133	0.320	0.133	0.133	0	0	300	0.00
Total Hours	1.532	2.291	1.532	0.907			Total	2.7
Total (\$/acre)	\$30.64	\$45.82	\$30.64	\$18.14				

Field Fuel Usage

		Number of Field Operations									Trucks
		cultivate	tandem disk	harrow	air drill	row planter	SP sprayer	swather	forage harvester	spin spreader	3/4 ton pickup
Crop	L/acre	1.29	1.85	0.75	2.42	1.29	0.42	1.21	9	0.42	0.5
Cereal Silage											
Barley	15.26	1	0	0	1	0	2	1	1	0	0.5
Corn	15.52	1	1	1	0	1	2	0	1	0	0.5
Alfalfa-Grass Silage											
Alfalfa-grass	11.13	0	0	0	0	0	0	1	1	1	0.5
Oat nurse crop	20.46	1	2	2	1	0	2	1	1	0	0.5

Guidelines: Silage Production Costs

Fixed Costs			
Land value (\$/acre)	\$2,200	Land cost (\$/acre)	\$50.82
Total Silage acres	300	Machinery Investment (\$/acre)	\$375.00
Depreciation Rate	10.0%		
Investment Rate	2.75%		
Barley Silage Bunker Storage (total cost)	\$10,000	Machinery Depreciation cost (\$/acre)	\$37.50
Corn Silage Bunker Storage (total cost)	\$15,000	Machinery Investment cost (\$/acre)	\$10.31
Alfalfa Silage Bunker Storage (total cost)	\$10,000	Machinery Lease cost (\$/acre)	\$4.80
		Total (\$/acre)	\$52.61

Owned Equipment Inventory and Current Values							
	Market Value	Silage Usage %	Silage Allocation		Market Value	Silage Usage %	Silage Allocation
Power & Misc Equipment				Harvest Equipment			
4WD Tractor 300HP	\$150,000	10%	\$15,000	Swather 25ft	\$25,000	10%	\$2,500
MFD Tractor 175HP	\$50,000	10%	\$5,000	PT Forage Harvester	\$35,000	100%	\$35,000
	\$0	0%	\$0	PT Forage pickup header	\$5,000	100%	\$5,000
	\$0	0%	\$0	PT Forage corn header	\$10,000	100%	\$10,000
	\$0	0%	\$0	Dump wagon	\$10,000	100%	\$10,000
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
Total			\$20,000	Total			\$62,500

	Market Value	Silage Usage %	Silage Allocation		Market Value	Silage Usage %	Silage Allocation
Seeding, Tillage, Spraying				Trucks & Trailers			
Cultivator	\$25,000	10%	\$2,500	Diesel tandem w/silage box	\$50,000	10%	\$5,000
Harrow 70ft	\$25,000	10%	\$2,500		\$0	0%	\$0
Air tank	\$15,000	10%	\$1,500		\$0	0%	\$0
Air drill 50ft	\$60,000	10%	\$6,000		\$0	0%	\$0
SP sprayer	\$75,000	10%	\$7,500		\$0	0%	\$0
Corn Planter	\$10,000	50%	\$5,000		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
Total	\$210,000		\$25,000	Total			\$5,000

Owned Equipment TOTAL	\$112,500	\$375.00 per acre
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Leased Equipment Inventory							
	Annual Lease	Silage Usage %	Silage Allocation		Annual Lease	Silage Usage %	Silage Allocation
Power & Misc Equipment				Harvest Equipment			
enter equipment here	\$0	0%	\$0	enter equipment here	\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
Total			\$0	Total			\$0

	Annual Lease	Silage Usage %	Silage Allocation		Annual Lease	Silage Usage %	Silage Allocation
Seeding, Tillage, Spraying				Trucks & Trailers			
enter equipment here	\$0	0%	\$0	1/2 ton pickup	\$9,600	15%	\$1,440
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
	\$0	0%	\$0		\$0	0%	\$0
Total	\$0		\$0	Total			\$1,440

Leased Equipment TOTAL	\$1,440	\$4.80 per acre
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* Leased equipment costs are listed under Operating Costs on the Summary Page.

Other Assumptions

Fuel Costs:

Includes fuel used for field work, and trucking in inputs.

Machinery Operating Costs:

Includes costs for maintenance, repairs, licenses and insurance.

Crop Insurance: (2017 rates)

Risk Area #14 - 80% Coverage, \$160 Hail. Forage Area (FA) #6 - Establishment Insurance at \$80/ac coverage and annual Insurance at 80% coverage.

Miscellaneous Costs:

Includes overhead expenses: silage plastic, hydro, telephone, accounting, buildings, supplies and insurance, etc.

Land Taxes:

The average for the province was based on land tax assessment and mill rates of a sample of municipalities growing crops.

Interest On Operating:

Interest charges on operating costs are calculated at 5% for six months.

Land Investment Cost:

Land value are based on approximate average land values. Budget assumed 2.75% return net after tax investment cash value (84%).

Depreciation:

Assumed 10% on machinery, no salvage value.

Investment Cost:

Assumed 2.75% opportunity cost on machinery.

Estimated Farmgate Values:

Silage prices are based on estimated prices for fall/winter 2016/17.

Profitability & Breakeven Analysis:

Gross Revenue = Price per unit x Yield per acre (eg. barley silage: \$40.80/ton x 7.5 ton/ac = \$306.00/ac)

Net Profit = Gross Revenue - Total Cost

(eg. barley silage: \$306.00 gross revenue - \$280.50 total cost = \$25.50 per acre)

Operating Expense Ratio = (Operating Cost / Gross Revenue) x 100

(eg. barley silage: \$147.44 operating expense / \$306.00 gross revenue = 48.2%)

Breakeven Price = Cost / Target Yield (eg. barley silage cost \$280.50 / 7.5 ton = \$37.40 per ton)

Breakeven Yield = Cost / Price per Unit (eg. barley silage cost \$280.50 / \$40.80 ton = 6.88 ton)

Cost of TDN (\$/lb DM) Silage = Total Cost Per Ton / (2000 x silage dry matter% x silage TDN%)

(eg. barley silage cost \$37.4 per ton / (2000 x 36.8% DM x 62.8% TDN) = \$.081 per pound)

Cost of CP (\$/lb DM) Silage = Total Cost Per Ton / (2000 x silage dry matter% x silage CP%)

(eg. barley silage cost \$37.4 per ton / (2000 x 36.8% DM x 11.1% CP) = \$.458 per pound)

Equivalent Dry Hay Value (TDN Basis \$/ton) of silage = 2000 x Hay dry matter% x Hay TDN% x Silage Cost of TDN(\$/lb DM)

(eg. alfalfa grass hay (\$/ton) = 2000 x 87.4% DM x 60% TDN x \$.0809 per pound TDN barley silage (total cost @ \$37.4 per ton) = \$84.86 per ton) If dry hay costs less than \$84.86 per ton, it is a lower cost feed source.)

Equivalent Dry Hay Value (CP Basis \$/ton) of silage = 2000 x Hay dry matter% x Hay CP% x Silage Cost of CP(\$/lb DM)

(eg. alfalfa grass hay (\$/ton) = 2000 x 87.4% DM x 14% CP x \$.4578 per pound TDN barley silage (total cost @ \$37.4 per ton) = \$112.03 per ton) If dry hay costs less than \$112.03 per ton, it is a lower cost feed source.)

Created and maintained by [Manitoba Agriculture Farm Management](#)

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For more information, contact your local [Manitoba Agriculture Office](#) or:

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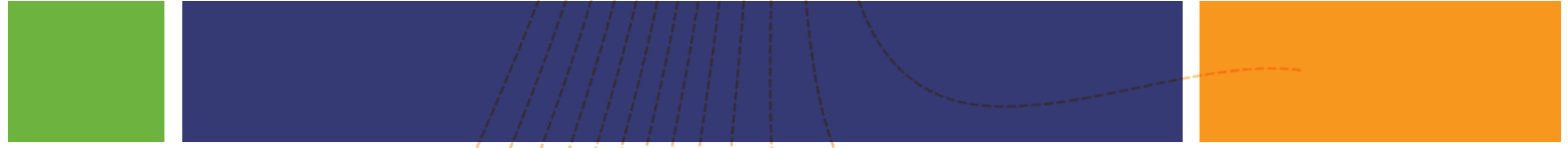
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Farm Production Extension

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For more information

- Contact your local Manitoba Agriculture Office.
- Visit us at manitoba.ca/agriculture.

