2024 Cost of Production

Silage

Manitoba

Manitoba

Guidelines For Estimating

Silage Production Costs - 2024

Date: January, 2024

****revised 2024 MAS(**

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:

The Farm Machinery Custom and Rental Rate Guide is also available to help determine machinery costs.

Contact Us

For more information, contact a Farm Management Specialist.

- manitoba.ca/agriculture
- mbfarmbusiness@gov.mb.ca
- 1-844-769-6224

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, contact a Farm Management Specialist.

Silage Production Cost Summary - 2024

	Barley Silage			Corn Silage			Alfalfa-Grass Silage				
	Annual Production Costs			Annual Production Costs			Year 1 Forage Establishment [1]	Annual (Years 2 to 8) Production Costs			
	$/acre	(as fed) $/ton	(Dry Matter-DM) $/ton	$/acre	(as fed) $/ton	(DM) $/ton	$/acre	$/acre	(as fed) $/ton	(DM) $/ton	Your Farm
A. Operating Costs											
Seed & Treatment	$29.25			$96.00			$36.00	-			
Nurse Crop Seed	-			-			$15.00	-			
Establishment (amortized)	-			-			-	$29.82			
Fertilizer	$88.05			$160.24			$99.72	$79.09			
Herbicide/Insecticide	$16.00			$16.00			$35.00	$0.00			
Field Fuel Costs	$21.36			$21.73			$28.64	$15.58			
Moving Fuel Costs	$3.58			$7.16			$1.95	$3.01			
Packing Fuel Costs	$3.50			$7.00			$1.90	$2.94			
Machinery Operating	$16.10			$16.10			$16.10	$16.10			
Machinery Lease	$4.80			$4.80			$4.80	$4.80			
Crop Insurance	$18.12			$28.54			$5.00	$19.74			
Miscellaneous	$7.50			$8.50			$2.00	$4.50			
Land Taxes	$10.00			$10.00			$10.00	$10.00			
Rental & Custom Costs	$0.00			$0.00			$0.00	$0.00			
Interest on Operating	$9.82			$16.92			$11.53	$8.35			
Total Operating	**$228.08**			**$392.99**			**$267.64**	**$193.94**			
B. Fixed Costs											
Land Costs	$80.41			$80.41			$80.41	$80.41			
Machinery Costs	$58.83			$58.83			$58.83	$58.83			
Storage Costs	$4.10			$4.10			$4.10	$4.10			
Total Fixed	**$143.34**			**$143.34**			**$143.34**	**$143.34**			
C. Owner - Labour & Living	**$41.36**			**$61.86**			**$41.36**	**$24.49**			
Total Costs	**$412.79**	**$55.04**	**$149.56**	**$598.19**	**$39.88**	**$113.94**	**$452.35**	**$361.77**	**$57.33**	**$132.71**	
Total Costs ($/lb.)		**0.0275**	**0.0748**		**0.0199**	**0.0570**			**0.0287**	**0.0664**	

Profitability & Breakeven Analysis

Estimated Farmgate		As Fed	DM		As Fed	DM			As Fed	DM	
Price $ per ton		**$60.00**	**$163.04**		**$52.00**	**$148.57**	**$59.71**		**$59.71**	**$138.21**	
Yield per acre (ton)		**7.50**	**2.76**		**15.00**	**5.25**	**4.08**		**6.31**	**2.73**	
Total Yield (tons/300 acres)		**2,250**	**828**		**4,500**	**1,575**			**1,893**	**818**	
Gross Revenue		**$450.00**			**$780.00**		**$243.61**		**$376.76**		
		(as fed)	(DM)		(as fed)	(DM)			(as fed)	(DM)	
Marginal Returns	$/acre	$/ton	$/ton	$/acre	$/ton	$/ton	$/acre	$/acre	$/ton	$/ton	
Over Operating Costs	$221.92	$29.59	$80.40	$387.01	$25.80	$73.72	($24.03)	$182.82	$28.97	$67.07	
Over Total Costs (Net Profit)	$37.21	$4.96	$13.48	$181.81	$12.12	$34.63	($208.74)	$14.99	$2.38	$5.50	
Operating Expense Ratio	**50.7%**			**50.4%**			**109.9%**	**51.5%**			
Breakeven Price Per Ton											
Operating Costs		$30.41	$82.64		$26.20	$74.86			$30.73	$71.15	
Total Costs		**$55.04**	**$149.56**		**$39.88**	**$113.94**			**$57.33**	**$9.09**	
Breakeven Yield (tons per acre)											
Operating Costs		3.8			7.6				3.2		
Total Costs		**6.9**			**11.5**				**6.1**		
Cost of Standing Silage ($/lb.)		**$0.018** [2]			**$0.014** [2]				**$0.018** [3]		
Cost of Standing Silage ($/ton)		**$36.43** [2]			**$28.90** [2]				**$36.19** [3]		
On-Farm Harvest Cost ($/ton)		**$18.61**			**$10.98**				**$21.14**		

TDN & Crude Protein Cost Analysis

	Barley Silage		Corn Silage		Alfalfa-Grass Silage	
	Nutrient Cost ($/pound DM)		Nutrient Cost ($/pound DM)		Nutrient Cost ($/pound DM)	
	TDN (62.8%)	Crude Protein (11.1%)	TDN (64.6%)	Crude Protein (8.7%)	TDN (60.4%)	Crude Protein (14.6%)
Without Storage Loss	**$0.1191**	**$0.6737**	**$0.0882**	**$0.6548**	**$0.1099**	**$0.4545**
With 5% Storage Loss (as fed)	**$0.1253**	**$0.7092**	**$0.0928**	**$0.6893**	**$0.1156**	**$0.4784**

1. Alfalfa-grass establishment (with oat silage nurse crop) net cost of $208.74 (total cost minus estimated gross revenue) were amortized over 7 silage production years.

2. Cost of barley and corn standing silage (includes: seed; fertilizer; pesticide; land taxes; crop insurance; 40% of fuel; 20% of labour,machinery lease, and machinery operating; 50% of other costs, and land costs.)

3. Cost of alfalfa and alfalfa-grass standing silage (includes: establishment, fertilizer, pesticide, land taxes, crop insurance, 5% of fuel and labour, 50% of other costs, and land costs.)

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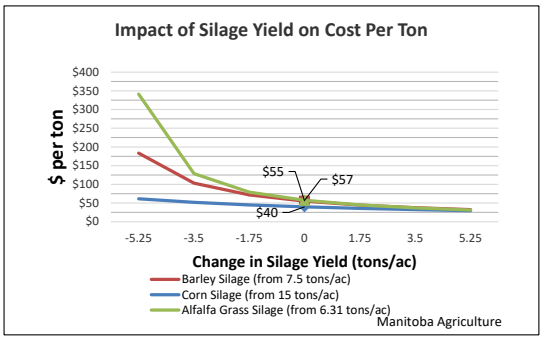
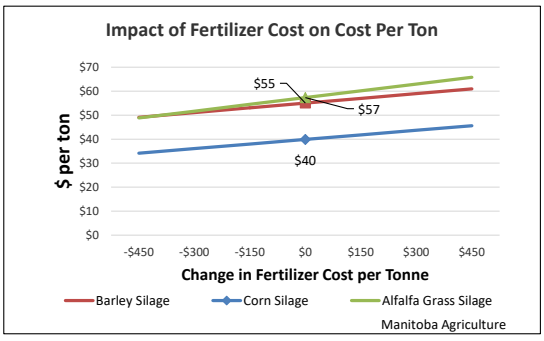
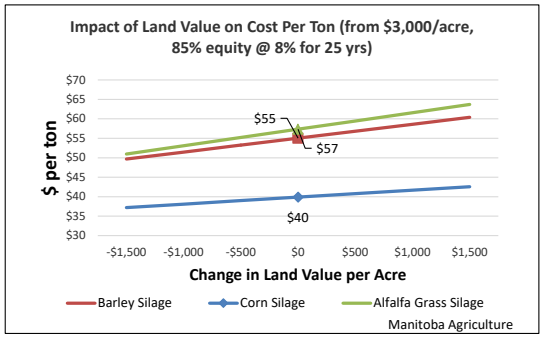
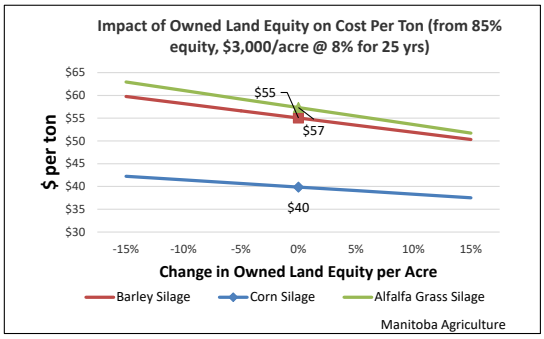
Risk & Sensitivity Analysis (Stress Test)

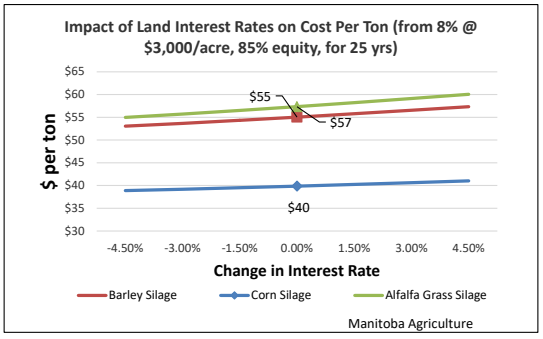
Baseline Values:			Barley Silage	Corn Silage	Alfalfa Grass Silage
Production (Tons per acre)			7.50	15.00	6.31
Production Cost ($ per ton as fed)			$55.04	$39.88	$57.33
Production Cost ($ per lb. as fed)			$0.028	$0.020	$0.029
		Amount Added	Changed Cost ($ per ton)		
Change in Silage Yield (tons per acre)		-1.75	$16.75	$5.27	$22.00
Change in Land Value	(from $3,000)	$500	$1.79	$0.89	$2.12
Percent Change in Owned Land Equity	(from 85%)	-5%	$1.57	$0.79	$1.87
Change in Land Interest Rate	(from 8%)	1.50%	$0.74	$0.37	$0.88
Change in Machinery Interest Rate	(from 8.5%)	1.50%	$0.24	$0.12	$0.29
Change in Fertilizer Cost ($ per tonne)		$150	$1.98	$1.91	$2.85
	Total Change in Cost ($ per ton)		$23.07	$9.34	$30.01
	'Stress Test' Production Cost ($ per ton)		$78.10	$49.22	$87.34
	($ per lb.)		$0.039	$0.025	$0.044











Forage Cost Comparison Analysis

		Barley Silage	Corn Silage	Alfalfa Grass Silage
Cost of Silage ($/wet ton)		$55.04	$39.88	$57.33
Equivalent Dry Hay Value (TDN Basis) for Breakeven Purchase Decision:				
Alfalfa/Grass - 12.6% H2O, 60% TDN	($/ton)	$124.89	$92.49	$115.22
	($/lb.)	$0.062	$0.046	$0.058
Alfalfa - 12.1% H2O, 61.5%TDN	($/ton)	$128.74	$95.35	$118.78
	($/lb.)	$0.064	$0.048	$0.059
Equivalent Dry Hay Value (CP Basis) for Breakeven Purchase Decision:				
Alfalfa/Grass - 12.6% H2O, 14% CP	($/ton)	$164.87	$160.25	$111.22
	($/lb.)	$0.082	$0.080	$0.056
Alfalfa - 12.1% H2O, 18.2% CP	($/ton)	$215.55	$209.52	$145.42
	($/lb.)	$0.108	$0.105	$0.073

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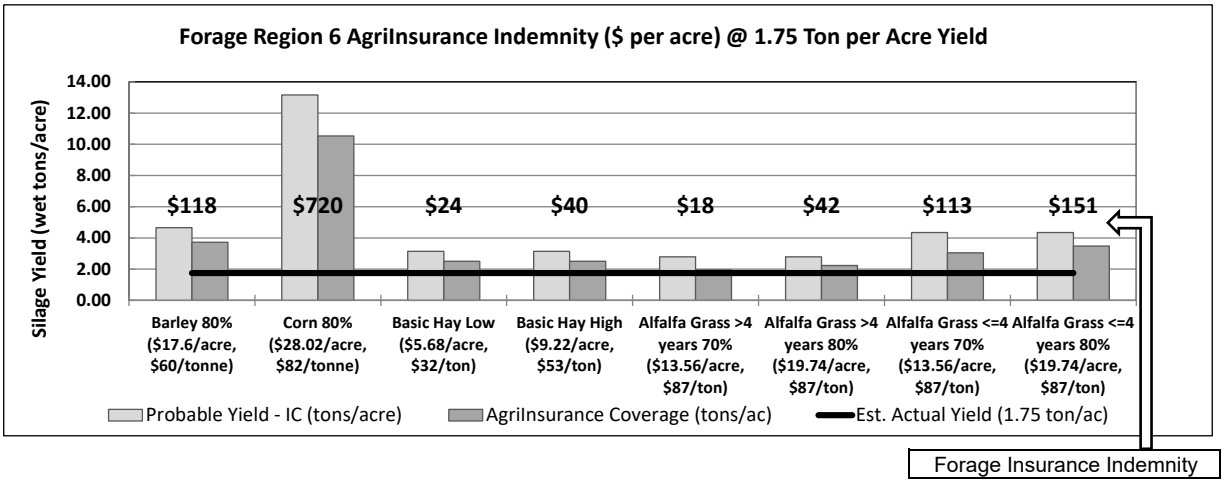
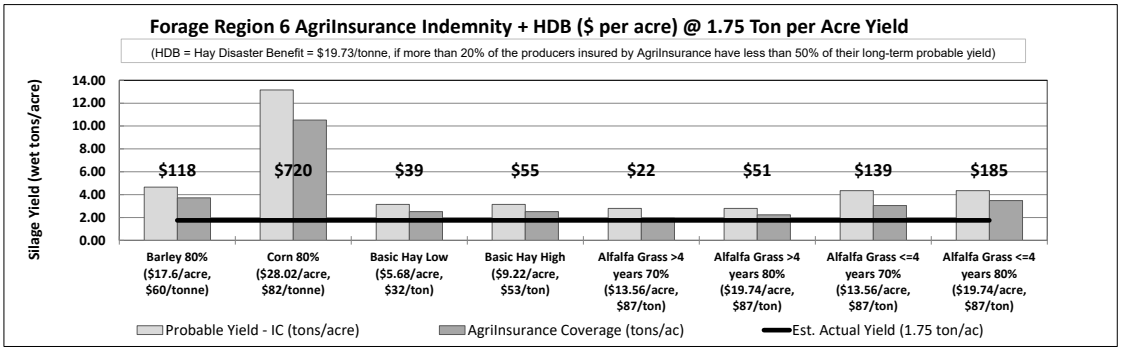
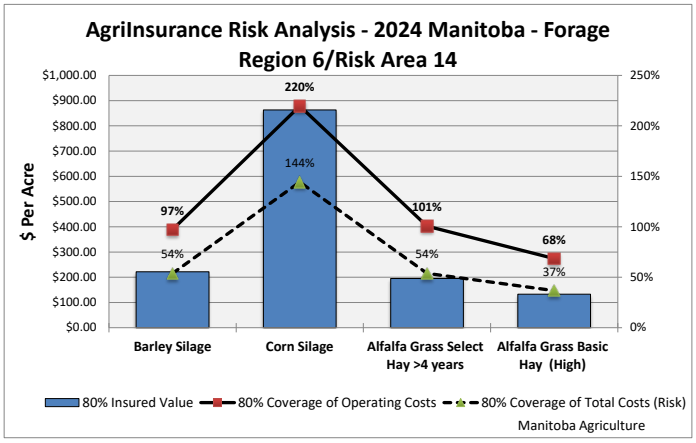
AgriInsurance Analysis

MASC Forage Region Map | MASC Forage Insurance

Forage Region 6 / Risk Area 14	Barley Silage	Corn Silage	Alfalfa Grass Silage					
			Basic Hay option		Select Hay option			
			80% Coverage		More Than 4 Year Stand		4 Years or Less Stand	
Based on 2024 MASC data	80% Coverage	80% Coverage	Low - $23/tonne	High - $38/tonne	70% Coverage	80% Coverage	70% Coverage	80% Coverage
A. **Silage Acres**	160	160	160	160	160	160	160	160
Coverage								
B. Probable Yield - IC (tons/acre)	4.654	13.158	3.138	3.138	2.788	2.788	4.347	4.347
C. Premium ($/Acre)	**$17.60**	**$28.02**	**$5.68**	**$9.22**	**$13.56**	**$19.74**	**$13.56**	**$19.74**
D. Premium (Total $) = A x C	**$2,816**	**$4,483**	**$909**	**$1,475**	**$2,170**	**$3,158**	**$2,170**	**$3,158**
E. Premium Cost (% of Insured) = C/H	7.9%	3.2%	7.1%	6.9%	7.9%	10.1%	5.1%	6.5%
Coverage Calculation								
F. Coverage (tons/acre) = B x %	3.723	10.526	2.510	2.510	1.952	2.230	3.043	3.478
G. Coverage ($/ton)	$59.62	$82.00	$31.84	$52.91	$87.44	$87.44	$87.44	$87.44
H. Coverage ($/acre) = F x G	**$221.96**	**$863.13**	**$79.93**	**$132.85**	**$170.64**	**$195.02**	**$265.99**	**$303.99**
I. Coverage (Total $) = A x H	**$35,513**	**$138,101**	**$12,789**	**$21,255**	**$27,302**	**$31,203**	**$42,558**	**$48,638**
Indmenity Calculation								
J. Avg.Silage Yield (tons/acre)	1.75							
K. Avg. Total No. of tons	280	280	280	280	280	280	280	280
L. Percent of Probable Yield	38%	13%	56%	56%	63%	63%	40%	40%
M. Forage Indemnity (tons/acre) = F - J	1.973	8.776	0.760	0.760	0.202	0.480	1.293	1.728
N. Forage Indemnity (% of coverage)	53.0%	83.4%	30.3%	30.3%	10.3%	21.5%	42.5%	49.7%
O. Est. Forage Indemnity ($/acre) = G x M	**$117.63**	**$719.63**	**$24.20**	**$40.21**	**$17.66**	**$41.97**	**$113.06**	**$151.10**
P. Estimated Forage Indemnity = A x O	**$18,820**	**$115,141**	**$3,872**	**$6,434**	**$2,826**	**$6,715**	**$18,090**	**$24,175**
Hay Disaster Benefit Calculation								
Q. Significant MB hay yield loss	Yes		(more than 20% of the producers insured by AgriInsurance have less than 50% of their long-term probable yield)					
R. Est. HDB ($/acre) = M x $19.73/ton	n/a	n/a	**$14.99**	**$14.99**	**$3.99**	**$9.47**	**$25.51**	**$34.09**
S. Est. Hay Disaster Benefit = A x R	n/a	n/a	**$2,399**	**$2,399**	**$638**	**$1,515**	**$4,082**	**$5,455**
Total Indemnity + HDB								
T. Est. Indemnity + HDB ($/acre) = O + R	**$117.63**	**$719.63**	**$39.19**	**$55.21**	**$21.65**	**$51.44**	**$138.57**	**$185.19**
U. Est.Indemnity + HDB = P + S	**$18,820**	**$115,141**	**$6,271**	**$8,833**	**$3,464**	**$8,231**	**$22,171**	**$29,630**
Breakeven Calculation								
Est. Breakeven yield (tons/acre)	3.428	10.184	2.332	2.336	1.797	2.004	2.888	3.252
Costs Not Covered By AgriInsurance								
Operating Costs	$6.13	$0.00	$114.00	$61.09	$23.30	$0.00	$0.00	$0.00
Operating & Fixed Costs	$149.47	$0.00	$257.34	$204.43	$166.64	$142.26	$71.29	$33.29
Total Costs	**$190.83**	**$0.00**	**$281.83**	**$228.92**	**$191.13**	**$166.75**	**$95.78**	**$57.78**
AgriInsurance Risk Ratio			(AgriInsurance Coverage / Cost)					
Operating Costs	97%	220%	41%	68%	88%	101%	137%	157%
Total Costs	54%	144%	22%	37%	47%	54%	74%	84%

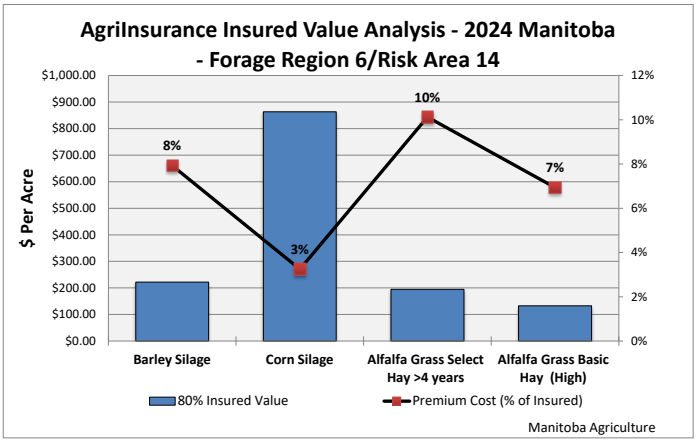


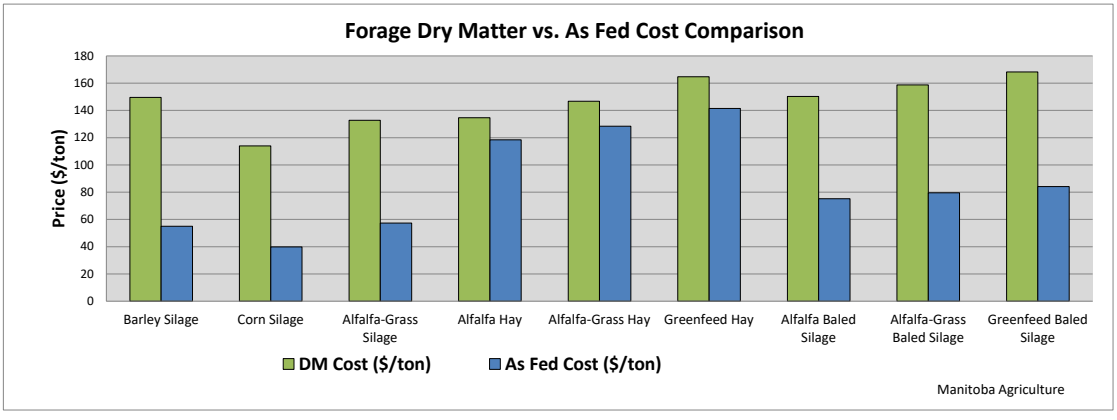


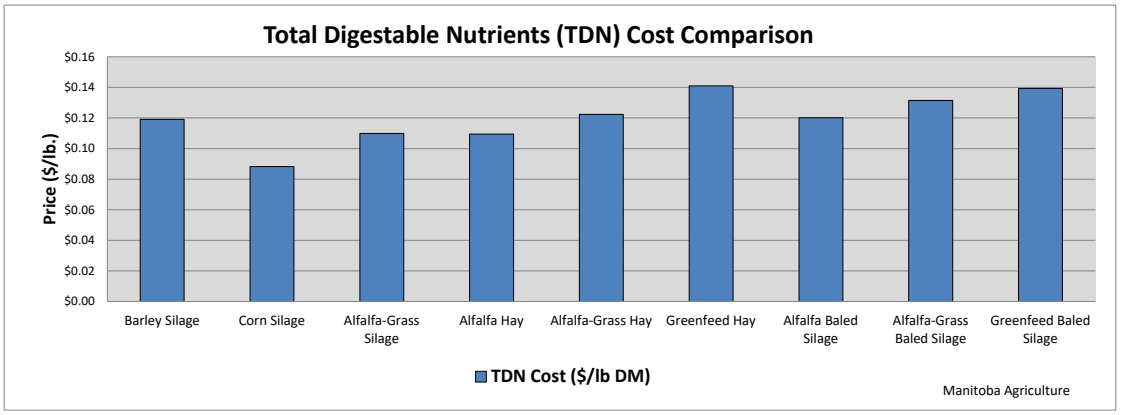


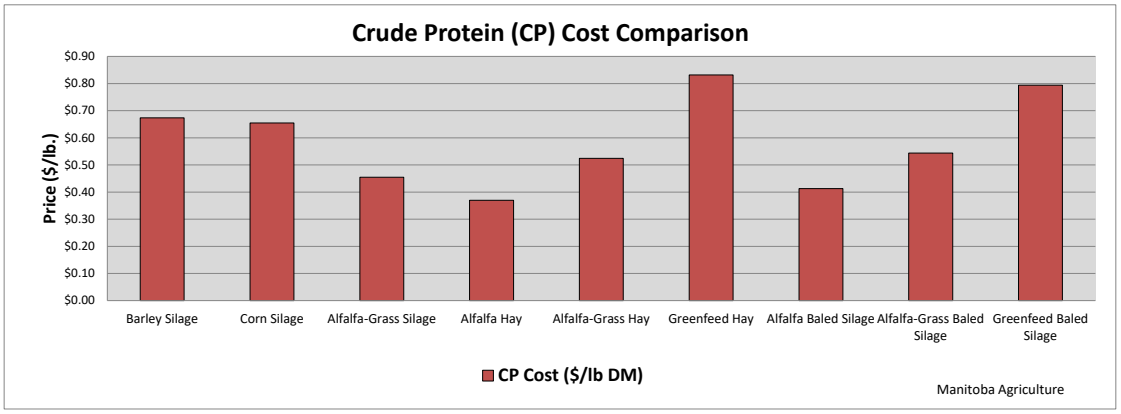
Analysis of your AgriInsurance coverage of operating and total costs is an important step in Risk Management Planning for your farm.

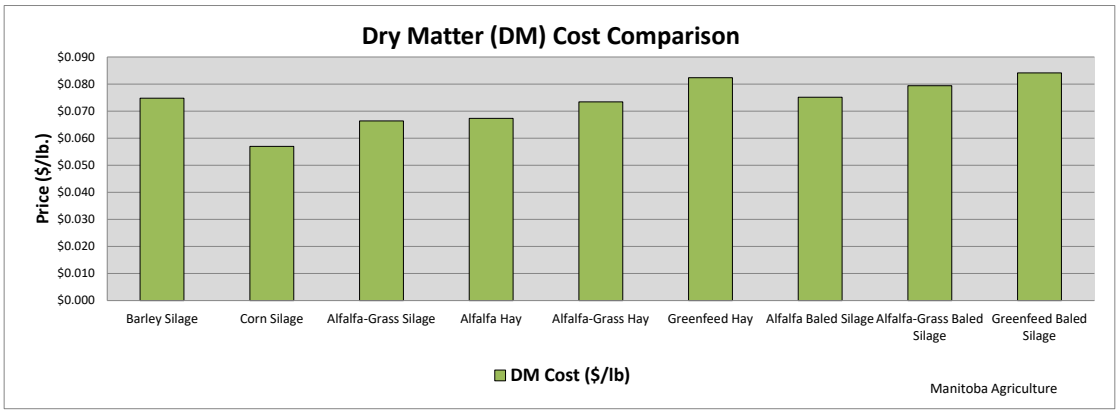
Analysis of AgriInsurance coverage and premium cost is useful in comparing cost efficiency and production cost risk. This is an important step in Risk Management Planning for your farm.






Total Digestable Nutrients (TDN) Cost Comparison
Price ($/lb.)
$0.16
$0.14
$0.12
$0.10
$0.08
$0.06
$0.04
$0.02
$0.00
Barley Silage
Corn Silage
Alfalfa-Grass Silage
Alfalfa Hay
Alfalfa-Grass Hay
Greenfeed Hay
Alfalfa Baled Silage
Alfalfa-Grass Baled Silage
Greenfeed Baled Silage
TDN Cost ($/lb DM)
Manitoba Agriculture


Crude Protein (CP) Cost Comparison
Price ($/lb.)
$0.90
$0.80
$0.70
$0.60
$0.50
$0.40
$0.30
$0.20
$0.10
$0.00
Barley Silage
Corn Silage
Alfalfa-Grass Silage
Alfalfa Hay
Alfalfa-Grass Hay
Greenfeed Hay
Alfalfa Baled Silage
Alfalfa-Grass Baled Silage
Greenfeed Baled Silage
CP Cost ($/lb DM)
Manitoba Agriculture


Dry Matter (DM) Cost Comparison
Price ($/lb.)
$0.090
$0.080
$0.070
$0.060
$0.050
$0.040
$0.030
$0.020
$0.010
$0.000
Barley Silage
Corn Silage
Alfalfa-Grass Silage
Alfalfa Hay
Alfalfa-Grass Hay
Greenfeed Hay
Alfalfa Baled Silage
Alfalfa-Grass Baled Silage
Greenfeed Baled Silage
DM Cost ($/lb)
Manitoba Agriculture

On-Farm Silage Harvest Cost Summary

	Barley Silage (as fed)		Corn Silage (as fed)		Alfalfa-Grass Silage (as fed)	
	$/acre	$/ton	$/acre	$/ton	$/acre	$/ton
Cost of Standing Silage	$273.23	$36.43	$433.56	$28.90	$228.38	$36.19
+ On-Farm Harvest Cost	$139.56	$18.61	$164.63	$10.98	$133.39	$21.14
= Total Production Costs	$412.79	$55.04	$598.19	$39.88	$361.77	$57.33

Custom Harvest Cost Comparison

	Barley Silage Options ($/hour)			Corn Silage Options ($/hour)			Alfalfa-Grass Silage Options ($/hour)		
Self Propelled Custom Harvest	#1	#2	#3	#1	#2	#3	#1	#2	#3
SP Forage Harvester (400-599HP)	$360	-	-	$360	-	-	$360	-	-
SP Forage Harvester (600-799HP)	-	$434	-	-	$434	-	-	$434	-
SP Forage Harvester (800-899HP)	-	-	$496	-	-	$496	-	-	$496
SP Corn Header (14-20FT)	-	-	-	$65	-	-	-	-	-
SP Corn Header (21-30FT)	-	-	-		$95	$95	-	-	-
SP Windrow Header (12-17FT)	$24	$24	$24	-	-	-	$24	$24	$24
Tandem Truck	$104	$104	$104	$104	$104	$104	$104	$104	$104
Tandem Truck	$104	$104	$104	$104	$104	$104	$104	$104	$104
Tandem Truck	-	$104	$104	-	$104	$104	-	$104	$104
Tandem Truck	-	-	-	-	-	$104	-	-	-
4WD Tractor (Packing)	$185	$185	$185	$185	$185	$185	$185	$185	$185
Total Custom Cost ($/hour)	$777	$955	$1,017	$818	$1,025	$1,191	$777	$955	$1,017
Work Rate (acres/hour)	17	19	21	9	13	15	17	19	21
Silage Yield (tons/acre)	7.5	7.5	7.5	15	15	15	6.31	6.31	6.31
Work Rate (tons/hour)	128	143	158	135	195	225	107	120	133
Total Custom Harvest Cost ($/ton)	$6.07	$6.68	$6.43	$6.06	$5.26	$5.29	$7.26	$7.96	$7.64
Total Custom Harvest Cost ($/acre)	$45.54	$50.07	$48.26	$90.90	$78.87	$79.41	$45.84	$50.20	$48.23

	Barley Silage Option ($/hour)		Corn Silage Option ($/hour)		Alfalfa-Grass Silage Option ($/hour)	
Pull Type Custom Harvest	#1	#2	#1	#2	#1	#2
PT Forage Harvester (150-250 HP)	$149	-	$149	-	$149	-
PT Forage Harvester (up tp 300 HP)	-	$169	-	$169	-	$169
Tractor FWA (160-224HP)	$123	-	$123	-	$123	-
Tractor FWA (225+HP)	-	$165	-	$165	-	$165
PT Forage Header - 2 Row	-	-	$28	-	-	-
PT Forage Header - 3 Row	-	-		$56	-	-
PT Pickup Header (70-79inch)	$16	-	-	-	$16	-
PT Pickup Header (80-96inch)	-	$28	-	-	-	$28
Tandem Truck	$104	$104	$104	$104	$104	$104
Tandem Truck	-	-	-	-	-	-
4WD Tractor (Packing)	$185	$185	$185	$185	$185	$185
Total Custom Cost ($/hour)	$578	$652	$589	$680	$578	$652
Work Rate (acres/hour)	3	4	2	4	3	4
Silage Yield (tons/acre)	7.5	7.5	15	15	6.31	6.31
Work Rate (tons/hour)	23	30	30	60	19	25
Total Custom Harvest Cost ($/ton)	$25.11	$21.72	$19.65	$11.33	$30.39	$26.07
Total Custom Harvest Cost ($/acre)	$188.32	$162.92	$294.72	$169.88	$191.79	$164.48

Custom Harvest Cost Analysis

Custom Silage Harvest Cost ($/Ton) - calculated from Work Rate and Custom Rate Per Hour

Work Rate (tons/hr)	Custom Rate ($/hour)					
	$500	$750	$1,000	$1,250	$1,500	$1,750
25	$20	$30	$40	$50	$60	$70
50	$10	$15	$20	$25	$30	$35
75	$7	$10	$13	$17	$20	$23
100	$5	$8	$10	$13	$15	$18
125	$4	$6	$8	$10	$12	$14
150	$3	$5	$7	$8	$10	$12
175	$3	$4	$6	$7	$9	$10
200	$3	$4	$5	$6	$8	$9

Work Rate (tons/hr) increment 25
Custom Rate ($/hr) increment $250

Custom Silage Harvest Rate ($/Hour) - Calculated from Work Rate and Custom Rate Per Ton

Work Rate (tons/hr)	Custom Rate ($/Ton)					
	$6	$7	$8	$9	$10	$11
10	$60	$70	$80	$90	$100	$110
35	$210	$245	$280	$315	$350	$385
60	$360	$420	$480	$540	$600	$660
85	$510	$595	$680	$765	$850	$935
110	$660	$770	$880	$990	$1,100	$1,210
135	$810	$945	$1,080	$1,215	$1,350	$1,485
160	$960	$1,120	$1,280	$1,440	$1,600	$1,760
185	$1,110	$1,295	$1,480	$1,665	$1,850	$2,035

Work Rate (tons/hr) increment 25
Custom Rate ($/ton) increment $1

Silage Harvest (Total Annual Hours) - Calculated from Work Rate and Silage Acres

Work Rate (acres/hr)	Silage Acres					
	200	225	250	275	300	325
1	200	225	250	275	300	325
3	67	75	83	92	100	108
5	40	45	50	55	60	65
7	29	32	36	39	43	46
9	22	25	28	31	33	36
11	18	20	23	25	27	30
13	15	17	19	21	23	25
15	13	15	17	18	20	22

Work Rate (tons/hr) increment 2
Silage Acre increment 25

Silage Harvest (Total Annual Acres) - Calculated from Work Rate and Silage Harvest Hours

Work Rate (acres/hr)	Silage Harvest (Annual Hours)					
	100	150	200	250	300	350
2	200	300	400	500	600	700
4	400	600	800	1,000	1,200	1,400
6	600	900	1,200	1,500	1,800	2,100
8	800	1,200	1,600	2,000	2,400	2,800
10	1,000	1,500	2,000	2,500	3,000	3,500
12	1,200	1,800	2,400	3,000	3,600	4,200
14	1,400	2,100	2,800	3,500	4,200	4,900
16	1,600	2,400	3,200	4,000	4,800	5,600

Work Rate (tons/hr) increment 2
Silage Annual Hours increment 50

Estimated Yield of Silage - Wet Tons per Acre [1]

Years	Barley tons/acre	Corn tons/acre	Alfalfa-Grass tons/acre	
1	7.50	15.00	4.08	(establishment year)
2	-	-	7.25	
3	-	-	7.25	
4	-	-	6.80	
5	-	-	6.34	
6	-	-	5.89	
7	-	-	5.44	
8	-	-	5.21	
9	-	-		
10	-	-		
Total Yield	-	-	44.2	
Average Yield (tons/acre)	7.50	15.00	6.31	
Avg. Dry Matter Yield (tons/acre)	2.76	5.25	2.73	
Years Production	1	1	7	
Years Rotation	1	1	8	

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

AgriInsurance - Individual Coverage	1.00	1.00	1.00
Estimated Storage Loss	5%		

Forage yields are based on Forage Region #6 and Risk Area #14 average yields with an IC of 1.25.

Silage Forage Analysis

	Barley	Corn	Alfalfa-Grass
Crude protein DM (CP)%	11.1	8.7	14.6
Energy DM (TDN) %	62.8	64.6	60.4
As fed moisture %	63.2	65.0	56.8

Silage Price Formula

		Barley	Corn	Alfalfa-Grass
Grain price (per bushel)		$6.00	$6.50	-
Dry Hay price ($ per ton)		-	-	$120.00
Silage Price Factor	x	10.00	8.00	0.4976
Silage ($ per wet ton)		$60.00	$52.00	$59.71

Forage Value Comparison (Feed Analysis)

	Alfalfa/Grass Hay	Alfalfa Hay	Greenfeed
Crude Protein feed analysis %	14.0	18.2	9.9
TDN feed analysis %	60.0	61.5	58.4
Moisture content %	12.6	12.1	14.2

Seed & Treatment

Crop	Seeding Rate per Acre		Price per Unit		Cost per Acre
Cereal Silage					
Barley	2.25	bu	$13.00	/bu	**$29.25**
Corn	32,000	plants	$0.00300	/plant	**$96.00**
Alfalfa-Grass Silage					
Alfalfa-grass	10	lb.	$3.60	/lb.	**$36.00**
Oat nurse crop (silage)	1.25	bu	$12.00	/bu	**$15.00**

Fertilizer [1]

Fertilizer Type	Bulk Price $/tonne	Actual Nutrient $/lb.	Nitrogen Usage	Sulphur Usage
Nitrogen: (urea) 46-0-0	$825	$0.814	100%	-
Nitrogen: (NH3) 82-0-0	$1,300	$0.719	0%	-
Nitrogen: (liquid) 28-0-0	$500	$0.810	0%	-
Phosphorus: 11-52-0	$1,075	$0.766	-	-
Potash: 0-0-60	$625	$0.473	-	-
Sulphur: 20.5-0-0-24	$600	$0.439	-	100%
MES S15: 13-33-0-15	$1,000	$0.635	-	0%

	Amount of Actual Pounds of Elements Applied Per Acre								
	Nitrogen		Phosphorus		Potash		Sulphur		Total
Crop	lbs.	$/acre	lbs.	$/acre	lbs.	$/acre	lbs.	$/acre	$/acre
Cereal Silage									
Barley	80	$59.92	30	$28.13	0	$0.00	0	$0.00	**$88.05**
Corn	130	$90.20	50	$46.89	25	$11.81	10	$11.34	**$160.24**
Alfalfa-Grass Silage									
Alfalfa-grass	0	$0.00	40	$37.51	52	$24.57	15	$17.01	**$79.09**
Oat nurse crop (silage)	50	$21.65	50	$46.89	30	$14.17	15	$17.01	**$99.72**

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

Crop	Weed Control $/acre	Insect Control $/acre	Forage Removal $/acre	Total Cost $/acre
Cereal Silage				
Barley	$16.00	$0.00		**$16.00**
Corn	$16.00	$0.00		**$16.00**
Alfalfa-Grass Silage				
Alfalfa-grass	$0.00	$0.00		**$0.00**
Oat nurse crop (silage)	$20.00	$0.00	$15.00	**$35.00**

Operating Costs

Interest Rate on Operating	9.00%
Silage machinery repair	4.00% (% of total investment)
Land Taxes ($/acre)	$10.00
Fuel Cost ($/litre)	$1.40
Labour Cost per Hour	$27.00

	Barley Silage	Corn Silage	Alfalfa Grass Silage Establishment	Alfalfa Grass Silage Production
Field Fuel Cost ($/acre)	$21.36	$21.73	$28.64	$15.58
Moving Fuel Cost				
Truck capacity (tons)	20	20	20	20
Fuel Use (miles/gal)	2	2	2	2
Distance to storage (miles)	3	3	3	3
Total ($/acre)	$3.58	$7.16	$1.95	$3.01
Packing Fuel Cost				
Tons per hour	45	45	45	45
Fuel Consumption (litres/hour)	15	15	15	15
Total ($/acre)	$3.50	$7.00	$1.90	$2.94
Crop Insurance [1] ($/acre)	80% Coverage	80% Coverage		Select_Hay 80% Coverage
	$18.12	$28.54	$5.00	$19.74
Other Costs ($/acre)	$7.50	$8.50	$2.00	$4.50
Rental and Custom Work				
Seeding/Planting ($/ace)	$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

[1] Crop insurance: (2023 rates)
Forage Establishment Insurance for $80/ac coverage. Annual Insurance for Alfalfa-Grass Select_Hay Silage coverage in MASC (Forage Region 6) with LTAY >4 years yield=2.788 tons/acre. Annual Insurance for Greenfeed Silage 80% Coverage coverage in MASC (Risk Area 14) with Long Term Average Yield (LTAY)=4.654 tons/acre including $0.52/acre Excess Moisture Insurance (EMI) coverage and Corn Silage 80% Coverage coverage in MASC (Risk Area 14) with LTAY yield=13.158 tons/acre including $0.52/acre EMI coverage.

Labour Hours per Acre	Barley Silage	Corn Silage	Alfalfa Grass Silage Establishment	Alfalfa Grass Silage Production	# Hired Staff	# of Months	Acres Farmed	Hours 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				
Total Hours	1.532	2.291	1.532	0.907			**Total**	2.7
Total ($/acre)	$41.36	$61.86	$41.36	$24.49				

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

Fixed Costs

Land

Average Land value ($/acre)		$3,000
Total Silage acres		300
Owned Land Equity		85%
Land Financed ($450 per acre)		15%
Land Opportunity Cost (Investment Rate)		1.50%

Land cost ($/acre)

Finance Rate & Term	8.000%	25 Years
Principle & Interest Cost		$42.16
Owned Land Opportunity Cost		$38.25
Total Cost		$80.41

Silage Storage

Silage Bunker Storage (total cost)		$15,000
Total Investment ($/acre)		$50
Residual Value (End of Useful Life)		20%
Useful Life (years)		20
Owned Silage Storage Equity		85%
Silage Storage Financed ($8 per acre)		15%
Silage Storage Opp. Cost (Investment Rate)		1.50%

Silage Storage Cost ($/acre)

Finance Rate & Term	8.500%	7 Years
Principle & Interest Cost		$1.47
Storage Depreciation Cost		$2.00
Owned Storage Opportunity Cost		$0.64
Total Cost		$4.10

Machinery

Total Investment ($/acre)		$403
Residual Value (End of Useful Life)		25%
Useful Life (years)		15
Owned Equipment Equity		55%
Equipment Financed ($181 per acre)		45%
Machinery Opportunity Cost (Investment Rate)		1.50%

Machinery Cost ($/acre)

Finance Rate & Term	8.500%	7 Years
Principle & Interest Cost		$35.39
Machinery Depreciation Cost		$20.13
Owned Machinery Opportunity Cost		$3.32
Total Cost		$58.83

Total Land, Machinery & Storage Debt ($/acre) $639

Owned Equipment Inventory and Current Values

Power & Misc. Equipment	Market Value	Silage Usage %	Silage Allocation
4WD Tractor 300HP	$165,000	10%	$16,500
MFD Tractor 175HP	$55,000	10%	$5,500
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
Total			$22,000

Harvest Equipment	Market Value	Silage Usage %	Silage Allocation
Swather 25ft	$27,500	10%	$2,750
PT Forage Harvester	$38,500	100%	$38,500
PT Forage pickup header	$5,500	100%	$5,500
PT Forage corn header	$11,000	100%	$11,000
Dump wagon	$11,000	100%	$11,000
	$0	0%	$0
	$0	0%	$0
Total			$68,750

Seeding, Tillage, Spraying	Market Value	Silage Usage %	Silage Allocation
Cultivator	$25,000	10%	$2,500
Harrow 70ft	$25,000	10%	$2,500
Air tank	$15,000	10%	$1,500
Air drill 50ft	$60,000	10%	$6,000
SP sprayer	$75,000	10%	$7,500
Corn Planter	$10,000	50%	$5,000
	$0	0%	$0
	$0	0%	$0
Total	$210,000		$25,000

Trucks & Trailers	Market Value	Silage Usage %	Silage Allocation
Diesel tandem w/silage box	$50,000	10%	$5,000
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
Total			$5,000

Owned Equipment TOTAL	$120,750	$402.50 per acre

Leased Equipment Inventory

Power & Misc. Equipment	Annual Lease	Silage Usage %	Silage Allocation
enter equipment here	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
Total			$0

Harvest Equipment	Annual Lease	Silage Usage %	Silage Allocation
enter equipment here	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
Total			$0

Seeding, Tillage, Spraying	Annual Lease	Silage Usage %	Silage Allocation
enter equipment here	$0	0%	$0
	$0	0%	$0
	$0	0%	$0
Total	$0		$0

Trucks & Trailers	Annual Lease	Silage Usage %	Silage Allocation
1/2 ton pickup	$9,600	15%	$1,440
	$0	0%	$0
	$0	0%	$0
Total			$1,440

Leased Equipment TOTAL	$1,440	$4.80 per acre

* 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: (2022 rates)
Forage Region 6 - Establishment Insurance at $80/ac coverage and annual Select_Hay insurance at 80% coverage. Risk Area 14 - Greenfeed Silage and Corn Silage 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 9% for six months.
Land Cost:
Based on approximate average land values. Budget assumed 15% financed at 8% for 25 years, plus 1.5% land equity opportunity cost. Budget can be used to estimate cashflow by removing investment cost.
P&I Cost (based on $135,000 Mortgage) = $12,647 payments per year) / 300 acres = $42.16/acre)
Investment = (Total Investment x Owned Equity %) x Investment Rate % (eg. (($3,000 x 85%) x 1.5%) = $38.25/acre)
Machinery Cost:
Based on approximate average machinery values. Budget assumed 45% financed at 8.5% for 7 years, depreciation costs over 15 years with a 25% residual value, plus 1.5% machinery equity opportunity cost. Budget can be used to estimate cashflow by removing depreciation and investment cost.
P&I Cost (based on $54,338 Loan) = $10,616 payment per year) / 300 acres = $35.39/acre)
Depreciation (Useage Cost) = (Total Investment - Residual Value) / Years Useful Life (eg. ($402.5 - ($402.5 x 25%)) / 15 = $20.13/acre)
Investment = (Total Investment x Owned Equity %) x Investment Rate % (eg. ($402.5 x 55%) x 1.5%) = $3.32/acre)

Estimated Farmgate Values:
Silage prices are based on estimated prices for fall/winter 2020/21.

Profitability & Breakeven Analysis:
Gross Revenue = Price per unit x Yield per acre (eg. barley silage: $60.00/ton x 7.5 ton/ac = $450.00/ac)

Net Profit = Gross Revenue - Total Cost
(eg. barley silage: $450.00 gross revenue - $412.79 total cost = $37.21 per acre)

Operating Expense Ratio = (Operating Cost / Gross Revenue) x 100
(eg. barley silage: $228.08 operating expense / $450.00 gross revenue = 50.7%)

Breakeven Price = Cost / Target Yield (eg. barley silage cost $412.79 / 7.5 ton = $55.04 per ton)

Breakeven Yield = Cost / Price per Unit (eg. barley silage cost $412.79 / $60.00 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 $55.04 per ton / (2000 x 36.8% DM x 62.8% TDN) = $.119 per pound)

Cost of CP ($/lb DM) Silage = Total Cost Per Ton / (2000 x silage dry matter% x silage CP%)
(eg. barley silage cost $55.04 per ton / (2000 x 36.8% DM x 11.1% CP) = $.674 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 $.1191 per pound TDN barley silage (total cost @ $55.04 per ton)= $124.89 per ton) If dry hay costs less than $124.89 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 $.6737 per pound TDN barley silage (total cost @ $55.04 per ton)= $164.87 per ton) If dry hay costs less than $164.87 per ton, it is a lower cost feed source.)

January, 2024

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