2020 Cost of Production
Silage
Guidelines For Estimating
Silage Production Costs - 2020

Date: January, 2020
**revised 02/24 with 2020 MASC data**

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, contact your local Manitoba Agriculture office.
### Silage Production Cost Summary - 2020

#### A. Operating Costs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed &amp; Treatment</td>
<td>$16.88</td>
<td>$92.80</td>
<td>$36.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse Crop Seed</td>
<td></td>
<td></td>
<td>$9.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishment ( amortized )</td>
<td></td>
<td></td>
<td>$4.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Herbicide/Insecticide</td>
<td></td>
<td></td>
<td>$9.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery Operating</td>
<td></td>
<td></td>
<td>$4.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop Insurance</td>
<td></td>
<td></td>
<td>$5.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$7.50</td>
<td>$8.50</td>
<td>$2.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Taxes</td>
<td>$10.00</td>
<td>$10.00</td>
<td>$10.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rental &amp; Custom Costs</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest on Operating</td>
<td></td>
<td></td>
<td>$5.27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Operating</td>
<td>$152.92</td>
<td>$286.51</td>
<td>$196.83</td>
<td>$107.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### B. Fixed Costs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery Depreciation</td>
<td></td>
<td></td>
<td>$37.50</td>
<td></td>
<td>$37.50</td>
<td></td>
<td>$37.50</td>
<td></td>
</tr>
<tr>
<td>Bunker Storage</td>
<td>$3.33</td>
<td></td>
<td>$3.33</td>
<td></td>
<td>$3.33</td>
<td></td>
<td>$3.33</td>
<td></td>
</tr>
<tr>
<td>Land Investment Costs</td>
<td>$51.98</td>
<td></td>
<td>$51.98</td>
<td></td>
<td>$51.98</td>
<td></td>
<td>$51.98</td>
<td></td>
</tr>
<tr>
<td>Machinery Investment</td>
<td>$10.31</td>
<td></td>
<td>$10.31</td>
<td></td>
<td>$10.31</td>
<td></td>
<td>$10.31</td>
<td></td>
</tr>
<tr>
<td>Bunker Storage</td>
<td>$0.46</td>
<td></td>
<td>$0.46</td>
<td></td>
<td>$0.46</td>
<td></td>
<td>$0.46</td>
<td></td>
</tr>
<tr>
<td>Total Fixed</td>
<td>$103.58</td>
<td></td>
<td>$105.48</td>
<td></td>
<td>$103.58</td>
<td></td>
<td>$103.58</td>
<td></td>
</tr>
<tr>
<td>Total Operating &amp; Fixed</td>
<td>$256.50</td>
<td></td>
<td>$391.99</td>
<td></td>
<td>$300.42</td>
<td></td>
<td>$211.46</td>
<td></td>
</tr>
</tbody>
</table>

#### C. Labour

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Costs</td>
<td>$293.27</td>
<td>$39.10</td>
<td>$106.26</td>
<td></td>
<td>$466.97</td>
<td>$31.93</td>
<td>$110.86</td>
<td>$337.18</td>
</tr>
<tr>
<td>Total Costs ($/lb.)</td>
<td>0.0196</td>
<td>0.0531</td>
<td>0.0160</td>
<td>0.0554</td>
<td>0.0185</td>
<td>0.0428</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Profitability & Breakeven Analysis

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Farmgate</td>
<td>$49.80</td>
<td>$135.33</td>
<td>$42.75</td>
<td>$148.44</td>
<td>$74.64</td>
<td>$172.77</td>
</tr>
<tr>
<td>Yield per acre</td>
<td>7.50</td>
<td>2.76</td>
<td>14.00</td>
<td>4.03</td>
<td>4.08</td>
<td>2.73</td>
</tr>
<tr>
<td>Gross Revenue</td>
<td>$373.50</td>
<td></td>
<td>$598.50</td>
<td></td>
<td>$304.52</td>
<td></td>
</tr>
<tr>
<td>Marginal Returns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over Operating Costs</td>
<td>$220.58</td>
<td>$29.41</td>
<td>$211.99</td>
<td>$77.38</td>
<td>$107.69</td>
<td>$37.67</td>
</tr>
<tr>
<td>Over Total Costs (Net Profit)</td>
<td>$80.23</td>
<td>$10.70</td>
<td>$161.53</td>
<td>$37.58</td>
<td>($32.66)</td>
<td>$37.67</td>
</tr>
<tr>
<td>Operating Expense Ratio</td>
<td>40.9%</td>
<td></td>
<td>47.9%</td>
<td></td>
<td>64.6%</td>
<td></td>
</tr>
<tr>
<td>Breakeven Price Per Ton</td>
<td>$20.39</td>
<td>$55.41</td>
<td>$20.47</td>
<td>$71.06</td>
<td>$17.10</td>
<td>$39.57</td>
</tr>
<tr>
<td>Total Costs</td>
<td>$39.10</td>
<td>$106.26</td>
<td>$31.93</td>
<td>$110.86</td>
<td>$36.96</td>
<td>$5.86</td>
</tr>
<tr>
<td>Breakeven Yield (tons per acre)</td>
<td>3.1</td>
<td></td>
<td>6.7</td>
<td></td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Total Costs</td>
<td>5.9</td>
<td></td>
<td>10.5</td>
<td></td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Cost of Standing Silage ($/lb.)</td>
<td>$0.012</td>
<td></td>
<td>$0.011</td>
<td></td>
<td>$0.010</td>
<td></td>
</tr>
</tbody>
</table>

### TDN & Crude Protein Cost Analysis

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TDN (62.8%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
<tr>
<td>Crude Protein (11.1%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
<tr>
<td>TDN (64.5%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
<tr>
<td>Crude Protein (8.7%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
<tr>
<td>TDN (60.4%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
<tr>
<td>Crude Protein (14.6%)</td>
<td>$0.0846</td>
<td>$0.4786</td>
<td>$0.0858</td>
<td>$0.6371</td>
<td>$0.0891</td>
<td>$0.5038</td>
</tr>
</tbody>
</table>

1. Alfalfa-grass establishment (with oat silage nurse crop) net cost of $32.66 (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 2.75% land investment 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 2.75% land investment 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 utilization of this information is the responsibility of the user.
### Risk & Sensitivity Analysis (Stress Test)

<p>| Percent Market Price Change | 0.0% |</p>
<table>
<thead>
<tr>
<th>Percent Crop Yield Change</th>
<th>-10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley Silage</td>
<td></td>
</tr>
<tr>
<td>Corn Silage</td>
<td></td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td></td>
</tr>
<tr>
<td>Your Farm</td>
<td></td>
</tr>
<tr>
<td>Market Price ($ per unit)</td>
<td></td>
</tr>
<tr>
<td>Barley Silage</td>
<td>$49.80</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>$42.75</td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td>$74.64</td>
</tr>
<tr>
<td>Yield (per acre)</td>
<td></td>
</tr>
<tr>
<td>Barley Silage</td>
<td>6.75</td>
</tr>
<tr>
<td>Corn Silage</td>
<td>12.60</td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td>5.68</td>
</tr>
</tbody>
</table>

**Stress Test Scenario = Market Price Up 0%, and Crop Yield Down 10%**

- **Net Profit (Loss)**
  - Barley Silage: $42.88
  - Corn Silage: $91.68
  - Alfalfa-Grass Silage: $190.70

- **Operating Expense Ratio**
  - Barley Silage: 45.5%
  - Corn Silage: 53.2%
  - Alfalfa-Grass Silage: 25.4%

- **Cost per ton**
  - Barley Silage: $43.45
  - Corn Silage: $35.47
  - Alfalfa-Grass Silage: $41.06

- **Cost of TDN ($ per pound)**
  - Barley Silage: $0.094
  - Corn Silage: $0.095
  - Alfalfa-Grass Silage: $0.079

- **Cost of Crude Protein ($ per pound)**
  - Barley Silage: $0.532
  - Corn Silage: $0.708
  - Alfalfa-Grass Silage: $0.326

### Agrilinsurance Analysis

<table>
<thead>
<tr>
<th>Forage Region 6</th>
<th>Barley Silage</th>
<th>Corn Silage</th>
<th>Alfalfa Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Area 14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Agrilinsurance

- **Probable Yield - IC (tons/acre)**
  - Barley Silage: 4.838
  - Corn Silage: 13.323
  - Alfalfa: 3.198

- **Coverage per acre (tons)**
  - Barley Silage: 3.870
  - Corn Silage: 10.658
  - Alfalfa: 2.558

- **Dollar Coverage per acre**
  - Barley Silage: $146.11
  - Corn Silage: $483.55
  - Alfalfa: $158.34

- **Premium ($/Acre)**
  - Barley Silage: $10.42
  - Corn Silage: $13.10
  - Alfalfa: $9.91

- **Premium Cost (% of Insured)**
  - Barley Silage: 7.1%
  - Corn Silage: 2.7%
  - Alfalfa: 6.3%

**Costs Not Covered By Agrilinsurance**

- **Operating Costs**
  - Barley Silage: $6.81
  - Corn Silage: $0.00

- **Operating & Fixed Costs**
  - Barley Silage: $105.39

- **Total Costs**
  - Barley Silage: $110.16

#### Agrilinsurance Risk Ratio

- **Operating Costs**
  - Barley Silage: 96%
  - Corn Silage: 169%
  - Alfalfa: 147%

- **Total Costs**
  - Barley Silage: 50%
  - Corn Silage: 108%
  - Alfalfa: 68%

### Forage Cost Comparison Analysis

<table>
<thead>
<tr>
<th>Forage Region 6</th>
<th>Barley Silage</th>
<th>Corn Silage</th>
<th>Alfalfa Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Area 14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Equivalent Dry Hay Value (TDN Basis)

- **Alfalfa/Grass - 12.6% H2O, 60% TDN**
  - ($/ton): $88.73
  - ($/lb): $0.044

- **Alfalfa - 12.1% H2O, 61.5%TDN**
  - ($/ton): $91.47
  - ($/lb): $0.046

#### Equivalent Dry Hay Value (CP Basis)

- **Alfalfa/Grass - 12.6% H2O, 14% CP**
  - ($/ton): $117.13
  - ($/lb): $0.059

- **Alfalfa - 12.1% H2O, 18.2% CP**
  - ($/ton): $153.14
  - ($/lb): $0.077

**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.

Manitoba Agriculture, Farm Management
Analysis of your AgrilInnsurance coverage of operating and total costs is an important step in Risk Management Planning for your farm.

Analysis of AgrilInnsurance 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.
## Estimated Yield of Silage - Wet Tons per Acre

<table>
<thead>
<tr>
<th>Years</th>
<th>Barley tons/acre</th>
<th>Corn tons/acre</th>
<th>Alfalfa-Grass tons/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.50</td>
<td>14.00</td>
<td>4.08</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>7.25</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
<td>7.25</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>6.80</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>-</td>
<td>6.34</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>-</td>
<td>5.89</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td>5.44</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>-</td>
<td>5.21</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Total Yield** | - | - | 44.2
**Average Yield (tons/acre)** | 7.50 | 14.00 | 6.31
**Avg. Dry Matter Yield (tons/acre)** | 2.76 | 4.03 | 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.

### AgrilInsurance - Individual Coverage

<table>
<thead>
<tr>
<th>Barley</th>
<th>Corn</th>
<th>Alfalfa-Grass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

### 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

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

### Silage Price Formula

<table>
<thead>
<tr>
<th>Grain price (per bushel)</th>
<th>Dry Hay price ($ per ton)</th>
<th>Silage Price Factor</th>
<th>Silage ($ per wet ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4.15</td>
<td>-</td>
<td>12.00</td>
<td>$49.80</td>
</tr>
<tr>
<td>$4.75</td>
<td>-</td>
<td>9.00</td>
<td>$42.75</td>
</tr>
<tr>
<td>-</td>
<td>150.00</td>
<td>0.4976</td>
<td>$74.64</td>
</tr>
</tbody>
</table>

### Forage Value Comparison (Feed Analysis)

<table>
<thead>
<tr>
<th>Crude Protein feed analysis %</th>
<th>TDN feed analysis %</th>
<th>Moisture content %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa/Grass Hay</td>
<td>Alfalfa Hay</td>
<td>Greenfeed</td>
</tr>
<tr>
<td>14.0</td>
<td>18.2</td>
<td>9.9</td>
</tr>
<tr>
<td>60.0</td>
<td>61.5</td>
<td>58.4</td>
</tr>
<tr>
<td>12.6</td>
<td>12.1</td>
<td>14.2</td>
</tr>
</tbody>
</table>
### Seed & Treatment

<table>
<thead>
<tr>
<th>Crop</th>
<th>Seeding Rate per Acre</th>
<th>Price per Unit</th>
<th>Cost per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal Silage Barley</td>
<td>2.25 bu</td>
<td>$7.50 /bu</td>
<td>$16.88</td>
</tr>
<tr>
<td>Corn</td>
<td>32,000 plants</td>
<td>$0.00290 /plant</td>
<td>$92.80</td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa-grass</td>
<td>10 lb.</td>
<td>$3.60 /lb.</td>
<td>$36.00</td>
</tr>
<tr>
<td>Oat nurse crop (silage)</td>
<td>1.25 bu</td>
<td>$7.25 /bu</td>
<td>$9.06</td>
</tr>
</tbody>
</table>

### Fertilizer

<table>
<thead>
<tr>
<th>Fertilizer Type</th>
<th>Bulk Price $/tonne</th>
<th>Actual Nutrient $/lb.</th>
<th>Nitrogen Usage</th>
<th>Sulphur Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen: (urea) 46-0-0</td>
<td>$500</td>
<td>$0.493</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td>Nitrogen: (NH3) 82-0-0</td>
<td>$790</td>
<td>$0.437</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Nitrogen: (liquid) 28-0-0</td>
<td>$320</td>
<td>$0.518</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Phosphorus: 11-52-0</td>
<td>$615</td>
<td>$0.432</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Potash: 0-0-60</td>
<td>$470</td>
<td>$0.355</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sulphur: 20.5-0-0-24</td>
<td>$425</td>
<td>$0.382</td>
<td>-</td>
<td>100%</td>
</tr>
<tr>
<td>MES S15: 13-33-0-15</td>
<td>$630</td>
<td>$0.527</td>
<td>-</td>
<td>0%</td>
</tr>
</tbody>
</table>

#### Amount of Actual Pounds of Elements Applied Per Acre

<table>
<thead>
<tr>
<th>Crop</th>
<th>Nitrogen lbs.</th>
<th>Phosphorus lbs.</th>
<th>Potash lbs.</th>
<th>Sulphur lbs.</th>
<th>Total $/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal Silage Barley</td>
<td>80 $39.44</td>
<td>30 $12.97</td>
<td>0 $0.00</td>
<td>0 $0.00</td>
<td>$52.41</td>
</tr>
<tr>
<td>Corn</td>
<td>130 $64.10</td>
<td>50 $21.61</td>
<td>25 $8.88</td>
<td>10 $3.82</td>
<td>$98.41</td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td>0 $0.00</td>
<td>40 $17.29</td>
<td>52 $18.48</td>
<td>15 $5.73</td>
<td>$41.50</td>
</tr>
<tr>
<td>Oat nurse crop (silage)</td>
<td>50 $24.65</td>
<td>50 $21.61</td>
<td>30 $10.66</td>
<td>15 $5.73</td>
<td>$62.65</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Crop</th>
<th>Weed Control $/acre</th>
<th>Insect Control $/acre</th>
<th>Forage Removal $/acre</th>
<th>Total $/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal Silage Barley</td>
<td>$12.00</td>
<td>$0.00</td>
<td>$12.00</td>
<td></td>
</tr>
<tr>
<td>Corn</td>
<td>$12.00</td>
<td>$0.00</td>
<td>$12.00</td>
<td></td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Oat nurse crop (silage)</td>
<td>$15.00</td>
<td>$0.00</td>
<td>$10.00</td>
<td>$25.00</td>
</tr>
</tbody>
</table>
### Guidelines: Silage Production Costs

#### Operating Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate on Operating</td>
<td>5.50%</td>
<td></td>
</tr>
<tr>
<td>Silage machinery repair</td>
<td>4.00%</td>
<td></td>
</tr>
<tr>
<td>Land Taxes ($/acre)</td>
<td></td>
<td>$10.00</td>
</tr>
<tr>
<td>Fuel Cost ($/litre)</td>
<td></td>
<td>$0.95</td>
</tr>
<tr>
<td>Labour Cost per Hour</td>
<td></td>
<td>$24.00</td>
</tr>
</tbody>
</table>

#### Field Fuel Cost ($/acre)

<table>
<thead>
<tr>
<th>Crop</th>
<th>Barley Silage</th>
<th>Corn Silage</th>
<th>Alfalfa Grass Silage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Fuel Cost ($/acre)</td>
<td>$14.50</td>
<td>$14.74</td>
<td>$19.44</td>
</tr>
<tr>
<td>Moving Fuel Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck capacity (tons)</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Fuel Use (miles/gal)</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Distance to storage (miles)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total ($/acre)</td>
<td>$2.43</td>
<td>$4.53</td>
<td>$1.32 $2.04</td>
</tr>
<tr>
<td>Packing Fuel Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tons per hour</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Fuel Consumption (litres/hour)</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Total ($/acre)</td>
<td>$2.38</td>
<td>$4.43</td>
<td>$1.29 $2.00</td>
</tr>
<tr>
<td>Crop Insurance ¹ ($/acre)</td>
<td>$10.94</td>
<td>$13.62</td>
<td>$5.00 $9.91</td>
</tr>
<tr>
<td>Other Costs ($/acre)</td>
<td>$7.50</td>
<td>$8.50</td>
<td>$2.00 $4.50</td>
</tr>
<tr>
<td>Rental and Custom Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeding/Planting ($/acre)</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Application ($/acre)</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Silage Harvesting ($/acre)</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>General ($/acre)</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Total ($/acre)</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

#### Labour Hours per Acre

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cropping</th>
<th>Swathing</th>
<th>Forage Harvest</th>
<th>Trucking</th>
<th>Packing</th>
<th>Total Hours</th>
<th>Total ($/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td># Hired</td>
<td>0.875</td>
<td>0.125</td>
<td>0.133</td>
<td>0.266</td>
<td>0.133</td>
<td>1.532</td>
<td>$36.77</td>
</tr>
<tr>
<td># of Acres Farmed</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1.532</td>
<td>$54.98</td>
</tr>
<tr>
<td>Hours Per Acre</td>
<td>0.250</td>
<td>0.125</td>
<td>0.133</td>
<td>0.266</td>
<td>0.133</td>
<td>0.907</td>
<td>$21.77</td>
</tr>
</tbody>
</table>

¹Crop insurance: (2020 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=3.198 tons/acre. Annual Insurance for Greenfeed Silage 80% Coverage coverage in MASC (Risk Area 14) with Long Term Average Yield (LTAY)=4.838 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=13.323 tons/acre including $0.52/acre EMI coverage.

#### Field Fuel Usage

<table>
<thead>
<tr>
<th>Crop</th>
<th>Number of Field Operations</th>
<th>Trucks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cultivate</td>
<td>tandem disk</td>
</tr>
<tr>
<td>Cereal Silage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>1.29</td>
<td>1.85</td>
</tr>
<tr>
<td>Corn</td>
<td>1.29</td>
<td>1.85</td>
</tr>
<tr>
<td>Alfalfa-Grass Silage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa-grass</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oat nurse crop</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
### Fixed Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
<th>Usage %</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land value ($/acre)</td>
<td>$2,250</td>
<td>100</td>
<td>$2,250</td>
</tr>
<tr>
<td>Land cost ($/acre)</td>
<td>$51.98</td>
<td>100</td>
<td>$51.98</td>
</tr>
<tr>
<td>Total Silage acres</td>
<td>300</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Machinery Investment ($/acre)</td>
<td>$375.00</td>
<td>100</td>
<td>$375.00</td>
</tr>
<tr>
<td>Depreciation Rate</td>
<td>10.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Rate</td>
<td>2.75%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery Depreciation cost ($/acre)</td>
<td>$37.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery Investment cost ($/acre)</td>
<td>$10.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley Silage Bunker Storage (total cost)</td>
<td>$10,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Silage Bunker Storage (total cost)</td>
<td>$15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alfalfa Silage Bunker Storage (total cost)</td>
<td>$10,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ($/acre)</td>
<td>$52.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Owned Equipment Inventory and Current Values

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4WD Tractor 300HP</td>
<td>$150,000</td>
<td>10%</td>
<td>$15,000</td>
<td>Swather 25ft</td>
<td>$25,000</td>
<td>10%</td>
<td>$2,500</td>
</tr>
<tr>
<td>MFD Tractor 175HP</td>
<td>$50,000</td>
<td>10%</td>
<td>$5,000</td>
<td>PT Forage Harvester</td>
<td>$35,000</td>
<td>100%</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>PT Forage pickup header</td>
<td>$5,000</td>
<td>100%</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>PT Forage corn header</td>
<td>$10,000</td>
<td>100%</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>Dump wagon</td>
<td>$10,000</td>
<td>100%</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$20,000</td>
<td></td>
<td></td>
<td></td>
<td>$62,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seeding, Tillage, Spraying</th>
<th>Market Value</th>
<th>Silage Value</th>
<th>Silage Allocation</th>
<th>Trucks &amp; Trailers</th>
<th>Market Value</th>
<th>Silage Value</th>
<th>Silage Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivator</td>
<td>$25,000</td>
<td>10%</td>
<td>$2,500</td>
<td>Diesel tandem w/silage box</td>
<td>$50,000</td>
<td>10%</td>
<td>$5,000</td>
</tr>
<tr>
<td>Harrow 70ft</td>
<td>$25,000</td>
<td>10%</td>
<td>$2,500</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Air tank</td>
<td>$15,000</td>
<td>10%</td>
<td>$1,500</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Air drill 50ft</td>
<td>$60,000</td>
<td>10%</td>
<td>$6,000</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>SP sprayer</td>
<td>$75,000</td>
<td>10%</td>
<td>$7,500</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Corn Planter</td>
<td>$10,000</td>
<td>50%</td>
<td>$5,000</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$210,000</td>
<td></td>
<td>$25,000</td>
<td></td>
<td>$5,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Leased Equipment Inventory

<table>
<thead>
<tr>
<th>Power &amp; Misc. Equipment</th>
<th>Annual Lease</th>
<th>Silage Lease</th>
<th>Silage Allocation</th>
<th>Harvest Equipment</th>
<th>Annual Lease</th>
<th>Silage Lease</th>
<th>Silage Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>enter equipment here</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>enter equipment here</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td></td>
<td>$0</td>
<td></td>
<td>$0</td>
<td></td>
<td>$0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Seeding, Tillage, Spraying</th>
<th>Annual Lease</th>
<th>Silage Lease</th>
<th>Silage Allocation</th>
<th>Trucks &amp; Trailers</th>
<th>Annual Lease</th>
<th>Silage Lease</th>
<th>Silage Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>enter equipment here</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>1/2 ton pickup</td>
<td>$9,600</td>
<td>15%</td>
<td>$1,440</td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td></td>
<td>$0</td>
<td></td>
<td>$1,440</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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: (2020 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 5.5% 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 2018/19.

**Profitability & Breakeven Analysis:**
Gross Revenue = Price per unit x Yield per acre (eg. barley silage: $49.80/ton x 7.5 ton/ac = $373.50/ac)

Net Profit = Gross Revenue - Total Cost
(eg. barley silage: $373.50 gross revenue - $293.27 total cost = $80.23 per acre)

Operating Expense Ratio = (Operating Cost / Gross Revenue) x 100
(eg. barley silage: $152.92 operating expense / $373.50 gross revenue = 40.9%)

Breakeven Price = Cost / Target Yield (eg. barley silage cost $293.27 / 7.5 ton = $39.10 per ton)

Breakeven Yield = Cost / Price per Unit (eg. barley silage cost $293.27 / $49.80 ton = 5.89 ton)

Cost of TDN ($/lb DM) Silage = Total Cost Per Ton / (2000 x silage dry matter% x silage TDN%)
(eg. barley silage cost $39.1 per ton / (2000 x 36.8% DM x 62.8% TDN) = $.0846 per pound)

Cost of CP ($/lb DM) Silage = Total Cost Per Ton / (2000 x silage dry matter% x silage CP%)
(eg. barley silage cost $39.1 per ton / (2000 x 36.8% DM x 11.1% CP) = $.4786 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 $.0846 per pound TDN barley silage (total cost @ $39.1 per ton)= $88.73 per ton) If dry hay costs less than $88.73 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 $.4786 per pound TDN barley silage (total cost @ $39.1 per ton)= $117.13 per ton) If dry hay costs less than $117.13 per ton, it is a lower cost feed source.)