Alberta Forage Industry

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What are Forages?

Forage is a term used to describe the vegetation from grass and legume plants that serves as a source of feed for domestic or wild animals through grazing or by mechanical harvesting.

For stored feed, this typically involves the removal of the majority of the above ground biomass, while for seed, the majority of the biomass is left in the field.

Forage plants also provide valuable ecological services through providing biodiversity, erosion control and the protection of water quality.
Alberta Forage Industry
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Forage Acres

- Native Range - 16,135,000
- Tame Pasture - 6,137,000
- Forage Seed - 132,000
- Tame hay - 5,995,989

** 28,399,989 ac
(50% of Alberta farmland)

Hay Production

Tame hay - 7,686,480 tonnes
(10 yr average)
Alberta Forage Industry

Tame Hay

Export Hay

Forage Seed
Tame Forage Utilization
Domestic vs Export Markets

Domestic Markets: 95%
Export Markets: 5%
Who’s Our Customer
What Drives Domestic Hay Production

- Livestock Numbers
- Competing Crops
- Farm Scale
- ROI
Domestic Hay Production

Which Forage Crops?

- 6 legume species
- 20 grass species
- Annuals, Biennials, Perennials
- Soil conditions
- Annual precipitation
- Market demand
Domestic Hay Quality

- Chemical Analysis
  - ADF, NDF, Protein
  - RFV (relative feed value)
- Color
- Smell
- Texture
- Mold
Grass Hay Production
General Cost Profile

- Seeding: 13%
- Fertilizer: 25%
- Harvest: 50%
- Storage: 12%

Average Costs over Crop Life
Fiber Composition: Alfalfa vs Orchardgrass

Alfalfa: ADF 35% NDF 45%
Orchardgrass: ADF 34% NDF 61%

Source: Manitoba Agriculture “Green Gold”
Warm Season Grasses

PRAIRIE SANDREED
(CALAMOVILFA LONGIFOLIA)

SWITCHGRASS
(PANICUM VIRGATUM)
## Mean Annual Yield 7 Grasses- 3 Prairie Provinces

Jefferson et al 2002

<table>
<thead>
<tr>
<th>Species</th>
<th>Cultivar</th>
<th>Brandon clay soil</th>
<th>Brandon sandy soil</th>
<th>Lethbridge</th>
<th>Swift Current</th>
<th>Swift Current Irrigated</th>
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<tbody>
<tr>
<td><strong>Cool –season</strong></td>
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<tr>
<td>Thickspike wheatgrass</td>
<td>Critana</td>
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<td>Lodorm</td>
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<td>7.5</td>
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<td>15.8</td>
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<td>6.6</td>
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<td>Mammoth wildrye</td>
<td>Rodan</td>
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<td>7.7</td>
<td>2.2</td>
<td>5.2</td>
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<tr>
<td>Western Wheatgrass</td>
<td>Rosana</td>
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<td>8.8</td>
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<td><strong>Warm-season</strong></td>
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<td>Big Bluestem</td>
<td>Bison</td>
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<td>5.5</td>
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<td>3.0</td>
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<td>Switchgrass</td>
<td>Dacotah</td>
<td>6.5</td>
<td>1.7</td>
<td>7.0</td>
<td>1.0</td>
<td>4.3</td>
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<tr>
<td>Prairie sandreed</td>
<td>Goshen</td>
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<td>9.5</td>
<td>1.1</td>
<td>2.4</td>
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<tr>
<td></td>
<td>ND-95</td>
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<td>7.9</td>
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<td>3.1</td>
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## Switchgrass Cultivar Cellulose or Hemicellulose Content

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Cellulose (g kg⁻¹)</th>
<th>Hemicellulose (g kg⁻¹)</th>
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<tbody>
<tr>
<td></td>
<td>Swift Current</td>
<td>Brandon</td>
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<tr>
<td>Blackwell</td>
<td>282</td>
<td>288</td>
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<tr>
<td>Cave-in-Rock</td>
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<td>283</td>
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<tr>
<td>Dacotah</td>
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<td>330</td>
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<td>Forestburg</td>
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<td>298</td>
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<td>Nebraska 28</td>
<td>307</td>
<td>294</td>
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<td>Pathfinder</td>
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<td>290</td>
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<td>Summer</td>
<td>285</td>
<td>311</td>
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<td>Sunburst</td>
<td>293</td>
<td>313</td>
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<td>ND 3743</td>
<td>306</td>
<td>342</td>
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<td>Trailblazer</td>
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<td>285</td>
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<td>LSD 0.05</td>
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<td>12</td>
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Jefferson et al ISRN Agronomy 2012
Forage Exports
Why Forage Exports

- Expanding livestock numbers
- Replacement of forage acres with food crops
- Less water for irrigated production
- Global reputation for quality, service and inspection regulations in Canada
Export Hay Production

Which Crop?

- Timothy
  - fiber source

- Alfalfa
  - protein source
Forage Export Products

- Compressed Hay
- Cubes
- Pellets
- Baled Hay
- Straw
Alberta Forage Exports ($ basis)

USA: 25%
Japan: 7%
Taiwan: 2%
S Korea: 2%
UAE: 2%
Europe: 2%
China: 7%
Misc: 2%

$114 million 2012
Alberta 70% of Canadian Exports

Source: Stats Canada
Export Hay Quality

- Color
- Mold
- Disease/Insects
- Fiber Content
- Chemical Analysis
  - ADF, NDF, Protein
  - RFV (relative feed value)
- Phytosanitary Certificates
Grass and Legume Forage Seed Production in Alberta

- 132,000 acres in Alberta
Grass Seed Crops
- Creeping red fescue
- Timothy
- Bromegrass
- Wheatgrasses
- Native grasses

Legume Seed Crops
- Alfalfa (mainly in southern AB)
- Clover (red, alsike and sweet)
Forage Seed Production Areas
Alberta Forage Seed Exports

Source: 2012 Stats Canada
Average % nutrient content of creeping red fescue seed, straw and re-growth samples collected from 2000-2004

<table>
<thead>
<tr>
<th>Plant Parts</th>
<th># of Samples</th>
<th>Nitrogen</th>
<th>Phosphorous</th>
<th>Potassium</th>
<th>Sulphur</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
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<tr>
<td>Seed</td>
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<td>2.35</td>
<td>0.39</td>
<td>0.90</td>
<td>0.59</td>
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<td>Straw</td>
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<td>1.10</td>
<td>0.12</td>
<td>0.28</td>
<td>1.64</td>
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<td>Re-growth</td>
<td>19</td>
<td>1.87</td>
<td>0.18</td>
<td>0.41</td>
<td>1.8</td>
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Questions?