Cereal forages for green feed and swath grazing

By
Mike Hall

East Central Research Foundation

Parkland College
Melfort
## Comparison of Extended Grazing Crops for Land Utilization

<table>
<thead>
<tr>
<th></th>
<th>Barley</th>
<th>Oat</th>
<th>Grass</th>
<th>Corn</th>
<th>Triticale</th>
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</thead>
<tbody>
<tr>
<td>Pasture days</td>
<td>day</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Carry cap.</td>
<td>Cow-d ha⁻¹</td>
<td></td>
<td>219</td>
<td>868</td>
<td>1152</td>
</tr>
<tr>
<td>Area</td>
<td>ha*</td>
<td></td>
<td>45.7</td>
<td>11.6</td>
<td>8.9</td>
</tr>
</tbody>
</table>

Area to graze 100 cows for 100 days
9 ha = 22 acres
45 ha = 111 acres

Slide courtesy: Vern Baron
Affect of crop species on green feed yield (lbs/ac) when seeded early around June 1. Work proposed by Forage Specialist Lorne Klein - Weyburn

<table>
<thead>
<tr>
<th>Location</th>
<th>Barley (Cowboy)</th>
<th>Barley (Maverick)</th>
<th>Oats (Haymaker)</th>
<th>Oats (Baler)W</th>
<th>triticale (Bunker)</th>
<th>triticale (Tyndall)</th>
<th>Golden German millet</th>
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</thead>
<tbody>
<tr>
<td><strong>Outlook (2014)</strong></td>
<td>6555a</td>
<td>6625a</td>
<td>7070a</td>
<td>7057a</td>
<td>7154a</td>
<td>6675a</td>
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<td><strong>Indian Head (2014)</strong></td>
<td>5133b</td>
<td>5071b</td>
<td>7511a</td>
<td>7274a</td>
<td>5697b</td>
<td>5825b</td>
<td>3726c</td>
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<td><strong>Yorkton (2014)</strong></td>
<td>8496b</td>
<td>8672b</td>
<td>8578b</td>
<td>7954bc</td>
<td>10500a</td>
<td>10841a</td>
<td>7033c</td>
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<tr>
<td><strong>Melfort (2014)</strong></td>
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<td>12119ab</td>
<td>10528c</td>
<td>11280abc</td>
<td>10616c</td>
<td>10853bc</td>
<td>5591d</td>
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<td>na</td>
<td>9900a</td>
<td>8920ab</td>
<td>8107b</td>
<td>4084c</td>
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<tr>
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<td>na</td>
<td>6185a</td>
<td>6061a</td>
<td>5930a</td>
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<td>na</td>
<td>12490ab</td>
<td>13412a</td>
<td>13414a</td>
<td>9388c</td>
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<td><strong>Outlook (2013)</strong></td>
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<td>na</td>
<td>na</td>
<td>13554ab</td>
<td>16725a</td>
<td>15679a</td>
<td>12128b</td>
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<td><strong>Indian Head (2012)</strong></td>
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<td>9980a</td>
<td>9105a</td>
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<tr>
<td><strong>Melfort (2012)</strong></td>
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<td>na</td>
<td>7933ab</td>
<td>na</td>
<td>7181b</td>
<td>6940b</td>
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</table>
Statistical yield comparisons between forage varieties

Tyndall triticale versus Baler Oats
- Better 1/10 site years
- Same 7/10 site years
- Worse 2/10 site years

Tyndall triticale versus Cowboy Barley
- Better 4/10 site years
- Same 4/10 site years
- Worse 2/10 site years

Baler Oats versus Cowboy Barley
- Better 1/10 site years
- Same 9/10 site years

Golden German millet versus Baler, Tyndall and Cowboy
- Never better
- Worse 5/10 site years

Averaged across sites (no stats)
- Tyndall triticale = 9448 lbs/ac
- Baler Oats = 9454 lbs/ac
- Cowboy Barley = 9031 lbs/ac
- Golden German Millet = 6826 lbs/ac
Throughout Western Canada, producers are taking advantage of high commodity prices by shifting land from perennial forage into annual crops. At the same time, livestock numbers remain steady and the industry is optimistic for good returns. These market pressures have increased interest in growing forages with maximum carrying capacities.

At the Saskatchewan Beef Industry Conference in Saskatoon, Dr. Vern Baron presented findings from a swath grazing trial conducted in Lacombe, Alberta that compared the carrying capacities of triticale and barley for swath grazing. In this study, triticale achieved almost double the carrying capacity of barley. This finding is in contrast to the forage variety trials done here in Saskatchewan which show triticale yields to be equal to or slightly below that of forage barley. The contrast has many people scratching their heads, but the explanation becomes clear with a closer look.

The triticale advantage becomes apparent when it is seeded earlier than barley in a swath grazing situation. Typically, barley for swath grazing is seeded mid-to-end of June so it is at the soft dough stage as close to freeze up as possible, maximizing forage quality. Delayed seeding after May 10 has a negative impact on barley biomass yield. Barley is photosensitive; therefore, a late seeding date results in a shorter duration of vegetative growth. However, triticale is not photosensitive and can be seeded at any time of the season, providing an advantage for those looking to utilize spring moisture.

Similar to triticale and barley were grown for silage (A). The triticale advantage over barley seems to occur earlier to utilize spring moisture and has a history of growing triticale compared to barley. During the summer variety trials at Agri-ARM sites, Tyndall Triticale with CDC Cowboy Barley and German Millet for yield.

FOR MORE INFORMATION
- A more detailed description of Dr. Baron’s findings is in the April 2013 edition of the Canadian Forage and Grassland Association’s magazine titled “Tighten Up With Triticale” and can be downloaded at www.saskbeef.org/industry-presentations.html.

- For more information on the yield variance and the potential for triticale, please contact Linda Hunter, Forage Specialist in Prince Albert at 306-953-2000 or linda.hunt@gov.sk.ca.
Effect of Planting Date on Yield and Carrying Capacity

Planting date must be delayed as late as June 30 to place swathing of barley in September.

Forage Yield Decreases

Carrying Capacity Decreases

May 10 ---------- June 23
May 10 ---------- June 23

Impact of seeding date on Cereal Forage Yield

Trial sites
• Yorkton East Central Research Foundation (ECRF)
• Melfort (Northeast Agriculture Research Foundation (Narf))

Two seeding dates
• Early
  • May 22 (Ecrf)
  • June 6 (Narf)
• Late
  • June 25 (Ecrf)
  • July 3 (Narf)

Seven Crop Species
• Barley
  • Cowboy
  • Maverick
• Oats
  • Baler
  • Haymaker
• Triticale
  • Tyndall
  • Bunker
• Golden German Millet

Adopt proposal by Sask Ag. Forage Specialists:
Allan Foster - Tisdale
Charlotte Ward - Yorkton
Fertility and Weed Control

• Yorkton
  • Preseed burnoff with glyphosate and cleanstart (volunteer canola)
  • In crop with Prestige
  • 50N 20P

• Melfort
  • Preseed burnoff with glyphosate
  • No in crop herbicide
  • No fertilizer (high N levels seeded on summerfallow)
Maverick was bred from Cowboy and has many of its attributes such as high forage yields and feed quality under low inputs. However, unlike Cowboy it has smooth awns to reduce the occurrence of mouth sores in cattle which is more of a problem in a swath grazing scenario where the cow is using snow as a water source. That Maverick is one smooth Cowboy!
• Haymaker oats is expected to replace Baler as it is reported to have better forage quality and yield.
• Forage oat not designed for milling
• Grain ripens while the plant stays green allowing producers to wait for the grain to mature before cutting. Cows like their oats green.
Tyndall and Bunker are awnletted (reduced awns) varieties which are more exceptable to cattle.
Golden German Millet

- Warm season cereal forage alternative with good forage quality.
- Drought tolerant but will not produce well in cool wet years.
- Establishes very slowly and can be uncompetitive against weeds.
- Makes a good swath grazing option
  - Late maturity
  - Waxy coating on leaves and stems helps to retain quality in swath
- Can be difficult to bale as greenfeed because it does not dry down quickly in the swath.
- Not suitable for grazing as it is shallow rooted
- Seeding rate 20 lbs/ac
Targeted stages for cutting

- Oats - milk dough
- Barley - soft dough
- Golden German Millet - 2 to 3 weeks after heading
- Triticale - soft to firm dough (swathed at milk/soft dough due to leaf disease)
Cereal forages on June 26 - Yorkton (Seeded May 22)

Maverick barley

Haymaker Oats

Tyndall Triticale

Golden German Millet
Cereal forages on July 7 - Yorkton (Seeded May 22)
Cereal forages on July 28 - Yorkton (Seeded May 22)

- Maverick barley
- Tyndall Triticale
- Haymaker Oats
- Golden German Millet
Cereal forages on August 18 – Yorkton (Seeded May 22)

- Maverick barley harvested August 5th
- Haymaker Oats harvested August 11th
- Tyndall Triticale: to be harvested August 19th
- Golden German Millet: to be harvested September 2nd
Maverick barley
Harvested Aug 5

Haymaker Oats
Harvest Aug 11

Cereal forages on Sept 2 -
Yorkton (Seeded May 22)

Tyndall Triticale
Harvested Aug 19

Golden German Millet
About to be harvested
Figure 1. Effect of Seeding Date on Cereal forage dry matter yield (Tonnes/ac). Lsd= 0.64 for species within a seeding date; Lsd = 1.1 for species between different seeding dates.
Harve Golden German Millet About to be harvested

Tyndall Triticale Harvested Aug 19

Maverick barley Harvested Aug 5

Haymaker Oats Harvest Aug 11

Cereal forages on Sept 2 - Yorkton (Seeded May 22)

Golden German Millet About to be harvested
Cereal forages on Sept 2 - Yorkton (Seeded late June 25)

Maverick barley
Harvested Sept 2

Haymaker Oats
Harvested Sept 15

Tyndall Triticale
Harvested Sept 26

Golden German Millet
Harvested Sept 26
Figure 2. Effect of Seeding Date on Cereal emergence (plants/ft²). Lsd= 7.6 for species between seeding dates; Lsd=5.6 for species within seeding date.

Seeded May 22

Seeded June 25

ECRF-Yorkton

CDC Cowboy Barley  Seeded May 22: 17.70

CDC Maverick Barley  Seeded May 22: 20.90

CDC Baler Oats  Seeded May 22: 22.20

CDC Haymaker Oats  Seeded May 22: 21.50

Bunker Triticale  Seeded May 22: 19.10

Tyndall Triticale  Seeded May 22: 21.00

Golden German Millet  Seeded May 22: 32.70

CDC Baler Oats  Seeded June 25: 16.30

CDC Haymaker Oats  Seeded June 25: 15.70

Bunker Triticale  Seeded June 25: 12.60

Tyndall Triticale  Seeded June 25: 14.80

Golden German Millet  Seeded June 25: 9.10
Figure 1. Effect of Seeding Date on Cereal forage dry matter yield (Tonnes/ac). Lsd= 0.64 for species within a seeding date; Lsd = 1.1 for species between different seeding dates.
Figure 3. Cereal Forage yields (Tonnes/ac) seeded early June 6 (NARF) Lsd=0.49

- CDC Cowboy Barley: 5.71 tonnes/ac
- CDC Maverick Barley: 5.51 tonnes/ac
- CDC Baler Oats: 5.13 tonnes/ac
- CDC Haymaker Oats: 4.79 tonnes/ac
- Bunker Triticale: 4.83 tonnes/ac
- Tyndall Triticale: 4.94 tonnes/ac
- Golden German Millet: 2.54 tonnes/ac
Figure 4. Cereal Forage yields (Tonnes/ac) seeded late July 3 (Narf) Lsd=0.74

- CDC Cowboy Barley: 5.31 tonnes/ac
- CDC Maverick Barley: 4.87 tonnes/ac
- CDC Baler Oats: 4.89 tonnes/ac
- CDC Haymaker Oats: 5.30 tonnes/ac
- Bunker Triticale: 5.53 tonnes/ac
- Tyndall Triticale: 5.47 tonnes/ac
- Golden German Millet: 4.13 tonnes/ac
### Days to soft dough stage at Melfort and Yorkton

<table>
<thead>
<tr>
<th>Seeding time</th>
<th>Barley</th>
<th>Triticale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early (Melfort)</td>
<td>76</td>
<td>82</td>
</tr>
<tr>
<td>Late (Melfort)</td>
<td>71</td>
<td>85</td>
</tr>
<tr>
<td>Early (Yorkton)</td>
<td>75</td>
<td>89</td>
</tr>
<tr>
<td>Late (Yorkton)</td>
<td>69</td>
<td>93</td>
</tr>
</tbody>
</table>

### Days to heading of Golden German Millet (Yorkton)

<table>
<thead>
<tr>
<th>Crop Specie</th>
<th>Seeding date</th>
<th>Days to heading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden German Millet</td>
<td>May 22 (Early)</td>
<td>81</td>
</tr>
<tr>
<td>Gold German Millet</td>
<td>June 25 (Late)</td>
<td>69</td>
</tr>
</tbody>
</table>
At both sites feed quality of all crops was adequate for mid-pregnancy cows. The average cow requires 55 per cent TDN during mid-pregnancy, 60 per cent during late pregnancy and 65 per cent after calving.
All crude protein (CP) adequate for a cow in mid-pregnancy requiring about seven per cent. Cows in late pregnancy require nine and after calving requirements are 11 per cent.
Conclusions

• How did forage quality compare between varieties and species
  • No glaring differences which the exception of protein with late seeded barley in Yorkton but this was due to yield suppression
  • Melfort had higher N levels and overall protein
  • All these forages could provide good feed by themselves for mid-pregnancy cows.
Conclusions

Which is the best cereal forage when seeding early?
• First place varies but Oat and triticale might have a slight edge on barley for yield.

Did Barley show photosensitivity?
• Yes. Vegetative period was shortened by 5 days with late seeding. In contrast, the vegetative period lengthened a few days for triticale.

Did late seeding reduce barley yield relative to Oats and Triticale?
• Melfort – Maybe a little?
• Yorkton- Yes. But can’t be all contributed the photosensitivity of barley. Excessive moisture was a confounding factor
• More work needed in this area. There could be varietal differences in barley photosensitivity and yield.
Conclusions

Is Golden German Millet a good alternative?

• Often yields less than barley, triticale and oats
• Not competitive against weeds, particularly when seeded early into cool conditions
• Comparable forage quality
• Developed more quickly and did well when seeded late.
Questions?
- Wapiti-triticale
- A.C. Murphy- Oat
- Vivar – Barley
- A.C. Lacombe - Barley
Comments from linda hunt
Cereal forages on Sept 16 - Yorkton (Seeded late June 25)
Figure 3. Cereal Forage yields (Tonnes/ac) seeded early
June 6 (NARF) LSD=0.49

- CDC Cowboy Barley: 5.71
- CDC Maverick Barley: 5.51
- CDC Baler Oats: 5.13
- CDC Haymaker Oats: 4.79
- Bunker Triticale: 4.83
- Tyndall Triticale: 4.94
- Golden German Millet: 2.54

Figure 4. Cereal Forage yields (Tonnes/ac) seeded late
July 3 (NARF) LSD=0.74

- CDC Cowboy Barley: 5.31
- CDC Maverick Barley: 4.87
- CDC Baler Oats: 4.89
- CDC Haymaker Oats: 5.30
- Bunker Triticale: 5.53
- Tyndall Triticale: 5.47
- Golden German Millet: 4.13
The affect of seeding date on cereal maturity

<table>
<thead>
<tr>
<th>Crop Specie</th>
<th>Seeding date</th>
<th>Days to soft dough</th>
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</thead>
<tbody>
<tr>
<td>Barley</td>
<td>May 22 (Early)</td>
<td>75</td>
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<tr>
<td>Barley</td>
<td>June 25 (Late)</td>
<td>69</td>
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<tr>
<td>Oats</td>
<td>May 22 (Early)</td>
<td>81</td>
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<tr>
<td>Oats</td>
<td>June 25 (Late)</td>
<td>82</td>
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<tr>
<td>Triticale</td>
<td>June 25 (Late)</td>
<td>93</td>
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Effect of Planting Date Harvest Date

Species | Planting Date
---|---