Forage grasses are not all created equal

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Farmer selection criteria for alfalfa and corn

- What genetic traits are available that I need and want?
- How has the variety/hybrid done in yield trials?
- For corn, what is the relative maturity I need?
- For alfalfa, how persistent is the variety/cultivar?
Farmer selection criteria for grass

- What do you have in stock?
- What do you have that’s cheap?
- What did I plant last year?
- What did my father/grandfather plant?
Grass or legume-grass?

- Your choice of grass species and variety may depend on whether you’re seeding straight grass or a legume-grass mixture.

- Straight grass: Maturity of grass species and variety.

- Legume grass: Need to match maturity of grass species/variety to the maturity of the legume.
## First cut alfalfa-reed canarygrass in an alfalfa-grass stand

<table>
<thead>
<tr>
<th></th>
<th>Alfalfa</th>
<th>Reed canarygrass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry matter, %</td>
<td>21.9</td>
<td>20.8</td>
</tr>
<tr>
<td>ADF, %</td>
<td>31.5</td>
<td>36.0</td>
</tr>
<tr>
<td>NDF, %</td>
<td>41.0</td>
<td>61.0</td>
</tr>
<tr>
<td>30-hr NDF digestibility, %</td>
<td>47.0</td>
<td>66.0</td>
</tr>
</tbody>
</table>
## Grass NDF at the boot stage

<table>
<thead>
<tr>
<th>Grass Species</th>
<th>Boot Stage</th>
<th>NDF, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bastion ryegrass</td>
<td>May 15</td>
<td>50</td>
</tr>
<tr>
<td>Select tall fescue</td>
<td>May 16</td>
<td>59</td>
</tr>
<tr>
<td>Bravo bromegrass</td>
<td>May 16</td>
<td>64</td>
</tr>
<tr>
<td>Intensiv orchardgr</td>
<td>May 18</td>
<td>60</td>
</tr>
<tr>
<td>Sunset timothy</td>
<td>May 20</td>
<td>63</td>
</tr>
<tr>
<td>Palaton reed canary</td>
<td>May 21</td>
<td>68</td>
</tr>
</tbody>
</table>
Grass NDF, head fully emerged

<table>
<thead>
<tr>
<th>Grass Type</th>
<th>Harvest Date</th>
<th>NDF, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extend orchardgrass</td>
<td>May 20</td>
<td>65</td>
</tr>
<tr>
<td>Bull tall fescue</td>
<td>May 20</td>
<td>61</td>
</tr>
<tr>
<td>Bastion ryegrass</td>
<td>May 25</td>
<td>61</td>
</tr>
<tr>
<td>Palaton reed canary</td>
<td>May 25</td>
<td>71</td>
</tr>
<tr>
<td>Summit timothy</td>
<td>May 27</td>
<td>68</td>
</tr>
</tbody>
</table>
Canarygrass         Tall fescue

Same field, same seeding date
## Cornell recommendations for alfalfa-grass seeding rates

<table>
<thead>
<tr>
<th>Lbs/ acre</th>
<th>1965</th>
<th>1985</th>
<th>2008</th>
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</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>8-12</td>
<td>8-12</td>
<td>8-12</td>
</tr>
<tr>
<td>Timothy</td>
<td>4-6</td>
<td>4-6</td>
<td>4-6</td>
</tr>
<tr>
<td>Bromegrass</td>
<td>5-8</td>
<td>5-8</td>
<td>5-8</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>4-6</td>
<td>4-6</td>
<td>4-6</td>
</tr>
<tr>
<td>Canarygrass</td>
<td>--</td>
<td>--</td>
<td>6-8</td>
</tr>
<tr>
<td>Tall fescue</td>
<td>--</td>
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<td>--</td>
</tr>
</tbody>
</table>
Timothy

+ High yield, good quality.
+ Adapted to varying soil types.
+ Tolerant of ice sheets.
+ The only species many horse owners recognize.

- Poor drought resistance, “goes to sleep” during the summer.
- A bunchgrass—less protection against soil erosion.
Bromeegrass

+ High yield, long stand life.
+ Holds quality well as it matures.
+ Good cold and drought tolerance.
+ A sod-former—fills in bare spots.

- Light, fluffy seed doesn’t work in many grain drills and seeders.
- Not tolerant of wet soils or intensive harvest management.
Orchardgrass

+ High yield.
+ Drought tolerant.
+ Good summer production.

- Can winterkill under extreme conditions.
- Very susceptible to ice sheet injury.
- Poorly adapted to wet soils.
- Loses quality fast.
- A bunchgrass, less protection against soil erosion.
Perennial ryegrass

- High yield under intensive management.
- Fast establishment.
- Good forage quality.

- Poor heat, cold, & drought resistance.
- Rapid quality loss after heading.
- Short-lived compared to other grass species.
Reed canarygrass

- Well adapted to wet soils; wide soil drainage tolerance.
- Vigorous root system, very tough sod.
- Long stand life.
- Will handle very high manure rates.

- Slow germination and seedling growth.
- Loses quality fast after heading.
- Shuts down early in fall.
Tall fescue

- Tolerant of moist to wet soils & flooding.
- High yield, good winter survival.
- Keeps growing into the fall.

- Past problems of low palatability forage, especially during the summer.
- Endophyte fungus can cause livestock problems. (Endophyte-free varieties now widely available.)
Festulolium

New kid on the block, a hybrid of Italian ryegrass and meadow fescue.

+ In Penn State trials, 1 variety held up well for 3 years.

- In Penn State trials, 3 varieties yielded very poorly in the 3rd year.
- Poor winter survival with low snow cover.
There are quality differences between species.

Timothy is usually higher in NDF-d than orchardgrass at the same stage of maturity, while orchardgrass is 1% or so higher in protein.

Fiber digestibility differences between varieties of the same species are small at the same stage of maturity.
Summary

- There is much more quality difference between species than for varieties within species. But...

- …there are huge differences in maturity (heading date) in some but not all species.

- Intake is important, so for dry cows look at NDF and NDF-d as well as % K.