<table>
<thead>
<tr>
<th>Bunch</th>
<th>Rhizomatous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchardgrass</td>
<td>Reed canarygrass</td>
</tr>
<tr>
<td>Tall fescue</td>
<td>Smooth bromegrass</td>
</tr>
<tr>
<td>Meadow fescue</td>
<td>Kentucky bluegrass</td>
</tr>
<tr>
<td>Timothy</td>
<td>Quackgrass</td>
</tr>
<tr>
<td>Festulolium</td>
<td>Meadow bromegrass</td>
</tr>
<tr>
<td>Ryegrasses</td>
<td></td>
</tr>
</tbody>
</table>
Orchardgrass (bunch)

Primary tiller

Growing point

Secondary tillers

Axillary bud
Quackgrass (rhizomatous)

Secondary tiller

Growing point

Rhizome

Primary tiller
Growing point – the leaf producing “engine”
Orchardgrass (bunch)

1st leaf

2nd leaf

3rd leaf

4th (1st) leaf

5th (2nd) leaf

6th (3rd) leaf

7th (4th) leaf
Days of growth

Pasture production

Vegetative stage
10 – 16 in. tall
3 – 4 leaves
(max photosynthesis)
Days of growth

Mature stage
> 20 in. tall
4 – 5 leaves
(senescence)

Pasture production

Days of growth

0 10 20 30 40 50 60
Carbohydrates

Produced by leaves; stored in stem bases, rhizomes, and roots.

- Keep plant alive during stress (after grazing, night, drought, winter).
- Needed to grow new leaves, tillers, roots.
The plant’s “to-do list” after grazing

1. Produce new leaves
2. Replace fine roots
3. Grow new tillers
3 – 4 in. residue

Critical leaf area
## Residue effects on vegetative orchardgrass

<table>
<thead>
<tr>
<th>Residue (in.)</th>
<th>No. grazing events</th>
<th>Average rotation time (days)</th>
<th>Average rotation yield (lb/acre)</th>
<th>Annual yield (lb/acre)</th>
<th>Date grass reached 12 in. next year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½</td>
<td>4</td>
<td>44</td>
<td>1250</td>
<td>5000</td>
<td>May 11</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>32</td>
<td>900</td>
<td>5400</td>
<td>May 4</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>24</td>
<td>750</td>
<td>4500</td>
<td>April 28</td>
</tr>
</tbody>
</table>
Residue effects on meadow fescue survival

<table>
<thead>
<tr>
<th>Residue height (in.)</th>
<th>Tillers (no./ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>250</td>
</tr>
<tr>
<td>3</td>
<td>200</td>
</tr>
<tr>
<td>1</td>
<td>150</td>
</tr>
</tbody>
</table>

25% loss
Residue effects on mature orchardgrass.

<table>
<thead>
<tr>
<th>Residue (in.)</th>
<th>No. grazing events</th>
<th>Average rotation (days)</th>
<th>Annual yield (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>73</td>
<td>6400</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>62</td>
<td>5700</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>60</td>
<td>5500</td>
</tr>
</tbody>
</table>
Residue height and hay harvest
Meadow fescue after cutting for hay for 2 years.
The dog days of summer,

and the perils of winter.
Grazing frequency effects on orchardgrass yield

Yield (lb/A)

May | Jun | Jul | Aug | Sep | Oct

June grazing ht.

6"
12"
Residue height of last grazing (October) and orchardgrass yield in 2012.
Wrong time
Too often
Too short
Wrong time

Poor productivity and persistence
A prescription for grazing:

- Pasture productivity and persistence of vegetative grass will likely be reduced in the current season and/or the next by grazing to a short residue.

- The negative effects of grazing vegetative grass to a short residue will be amplified when grass is stressed (previous grazing, drought, winter).