Better Grazing Management

Dr. Dennis Hancock
Extension Forage Specialist
Crop and Soil Sciences – UGA
Rational Grazing
Benefits of Rational Grazing

1. Better utilization of forage
# Efficiencies of Grazing and Mechanized Harvest

<table>
<thead>
<tr>
<th>Method</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazing</td>
<td></td>
</tr>
<tr>
<td>Continuous Stocking</td>
<td>30-40%</td>
</tr>
<tr>
<td>Slow Rotation (3-4 paddocks)</td>
<td>50-60%</td>
</tr>
<tr>
<td>Moderate Rotation (6-8 paddocks)</td>
<td>60-70%</td>
</tr>
<tr>
<td>Strip Grazing, Daily Rotation</td>
<td>70-80%</td>
</tr>
</tbody>
</table>
“How does your forage grow?”

The diagram shows a growth curve with the following phases:

- **Lag**
- **Linear**
- **Stationary**

The x-axis represents the **Days of Growth**, ranging from 0 to 50. The y-axis represents the **Available Forage** (dry mass/unit area) with values ranging from 0 to 12,000.

The growth curve has three distinct phases:

1. **Lag Phase**: The initial phase where growth is slow and steady.
2. **Linear Phase**: The phase where growth is more rapid and consistent.
3. **Stationary Phase**: The phase where growth slows down and levels off, indicating maturity or saturation of the forage growth.
“How does your forage grow?”

Days of Growth

<table>
<thead>
<tr>
<th>Days of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Forage Mass (dry lbs/acre)

<table>
<thead>
<tr>
<th>Mass (dry lbs/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td>4000</td>
</tr>
<tr>
<td>6000</td>
</tr>
<tr>
<td>8000</td>
</tr>
<tr>
<td>10000</td>
</tr>
<tr>
<td>12000</td>
</tr>
</tbody>
</table>

Growth Curve

Available Forage (dry mass/unit area)

Early Veg.

Late Veg.

Reproductive
Write this down in BIG **BOLD** letters!
Benefits of Rational Grazing

1. Better utilization of forage

2. Growth rate of forage is optimized
   - Kept in linear/exponential growth phase
   - Higher yield of forage
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4. More animal gains/milk production per acre
Effects of rotational stocking on performance of beef cattle grazing bermudagrass and endophyte-free tall fescue in central Georgia.

<table>
<thead>
<tr>
<th>Item</th>
<th>Continuous</th>
<th>Rotational</th>
<th>Difference*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow weight at calving, lbs</td>
<td>1037</td>
<td>1017</td>
<td>NS</td>
</tr>
<tr>
<td>Cow weight at weaning, lbs</td>
<td>1090</td>
<td>1071</td>
<td>NS</td>
</tr>
<tr>
<td>Stocking rate, cows/acre</td>
<td>0.50</td>
<td>0.69</td>
<td>+38%</td>
</tr>
<tr>
<td>Pregnancy rate, %</td>
<td>93</td>
<td>95</td>
<td>NS</td>
</tr>
<tr>
<td>Weaning weight, lb</td>
<td>490</td>
<td>486</td>
<td>NS</td>
</tr>
<tr>
<td>Calf production, lb/ac</td>
<td>243</td>
<td>334</td>
<td>+37%</td>
</tr>
</tbody>
</table>

* NS = not statistically significant
Increase in gain per acre in rotational compared to continuous stocked pastures in studies from various southern states.

<table>
<thead>
<tr>
<th>State</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>44</td>
</tr>
<tr>
<td>Georgia</td>
<td>37</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>35</td>
</tr>
<tr>
<td>Virginia</td>
<td>61</td>
</tr>
</tbody>
</table>
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Effect of Grazing System on Hay Needs

- Continuous Grazing
- Rotational Grazing

Lbs hay fed/cow

88-89: -25%
89-90: -22%
90-91: -39%
3 yr avg: -31%

$37.54/cow savings using $100/ton hay
What happens when a mob stays in a paddock too long?
Recreational Grazing
(Selective)
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6. Better persistence of desirable forages
   - Especially clover and legume species
What you don’t see….

Graze/Cut

Regrowth Begins

Adequate Rest

Graze/Cut Again

Roots die back

Roots die back even more
Proper Rest Following Grazing is Key!

• In continuously grazed pastures, most plants are grazed every 2 – 7 days.

• With recommended rest periods, roots will redevelop to approximately the same depth as uncut plants.

Picture staged by: C. Mackoviak, Univ. of Florida
# Grazing Rules of Thumb

<table>
<thead>
<tr>
<th>Crop</th>
<th>Target Height (inches)</th>
<th>Rest Period (days)</th>
<th>Recommended Rest Period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Begin Grazing</td>
<td>End Grazing*</td>
<td></td>
</tr>
<tr>
<td>Alfalfa (grazing types)</td>
<td>10-16</td>
<td>2-4</td>
<td>15-30</td>
</tr>
<tr>
<td>Annual Ryegrass</td>
<td>6-12</td>
<td>3-4</td>
<td>7-25</td>
</tr>
<tr>
<td>Bahiagrass</td>
<td>6-10</td>
<td>1-2</td>
<td>10-20</td>
</tr>
<tr>
<td>Bermudagrass</td>
<td>6-12</td>
<td>2-6</td>
<td>10-20</td>
</tr>
<tr>
<td>Clover, White</td>
<td>6-8</td>
<td>1-3</td>
<td>7-15</td>
</tr>
<tr>
<td>Clovers, Other</td>
<td>8-10</td>
<td>3-5</td>
<td>10-20</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>8-12</td>
<td>3-6</td>
<td>15-30</td>
</tr>
<tr>
<td>Pearl millet</td>
<td>20-24</td>
<td>8-12</td>
<td>10-20</td>
</tr>
<tr>
<td>Small grains</td>
<td>8-12</td>
<td>4</td>
<td>7-30</td>
</tr>
<tr>
<td>Sorghum/sudan</td>
<td>20-24</td>
<td>8-12</td>
<td>10-20</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>18-22</td>
<td>8-12</td>
<td>30-45</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>4-8</td>
<td>2-3</td>
<td>15-30</td>
</tr>
</tbody>
</table>

* Height at end of grazing may need to be higher to optimize intake of quality forage or vigorous re-growth.
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   - Especially clover and legume species
7. Better weed suppression
“More than meets the eye...”
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8. Better manure distribution
Manure Distribution

One paddock of 3–pasture rotation

One paddock of 24–pasture rotation

Piles per 500 ft²
### Manure Distribution

<table>
<thead>
<tr>
<th>Rotation Frequency</th>
<th>Years to Get 1 Pile/sq. yard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>27</td>
</tr>
<tr>
<td>14 day</td>
<td>8</td>
</tr>
<tr>
<td>4 day</td>
<td>4 – 5</td>
</tr>
<tr>
<td>2 day</td>
<td>2</td>
</tr>
</tbody>
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9. Builds soil organic matter/health
Relative Contribution to Soil OM of Below Ground to Above Ground Ranges between 1.5 to 3.7:1!*

- i.e., roots and root exudates contribute ~60-80% of soil OM!


Role of Grasslands in Soil OM

Graphic credit: Howpper (Wikipedia, Creative Commons).

- **Shortgrass prairie**
- **Mixed grass prairie**
- **Tallgrass prairie**
Improvement in soil OM in 3 paddocks located in a pasture-based dairy in Wrens, GA. (2007-2009)

<table>
<thead>
<tr>
<th>Paddock</th>
<th>Initial</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>P4</td>
<td>1.08</td>
<td>1.15</td>
<td>1.25</td>
<td>2.20</td>
</tr>
<tr>
<td>P8</td>
<td>1.01</td>
<td>1.17</td>
<td>1.59</td>
<td>2.18</td>
</tr>
<tr>
<td>P14</td>
<td>1.14</td>
<td>1.63</td>
<td>1.86</td>
<td>2.00</td>
</tr>
<tr>
<td>Avg.</td>
<td>1.07</td>
<td>1.32</td>
<td>1.57</td>
<td>2.13</td>
</tr>
</tbody>
</table>

3 years after grazing system started, averaging an inc. in soil OM of 0.35 percentage points per year!!!
Impact of Pasture-Based Livestock on Soil Carbon (Soil OM)

+0.30-0.33 percentage points each year

Soil Carbon (tons C/acre in top 12 inches)

Years Since Conversion to Pasture-Based Dairy

3.6 tons C/acre per year
“Take care of the land, and the land will take care of you.”
Forage crops are grown on approximately 4 million acres in Georgia and the associated forage-based livestock systems have a farm gate value of over $1.4 billion.

The UGA Forages website is your window to information on a wide variety of forage management issues. This information is extended to you by scientists from the University of Georgia, who continue to research all aspects of forage and livestock management. The recommendations found here are based on peer-reviewed research conducted in Georgia and throughout the world. The website provides accurate and up-to-date information about all...
QUESTIONS?

www.georgiaforages.com