2009 Georgia Grazing School:

Forage yield, distribution, and quality

Forage Yield, Distribution, and Quality:
(Matching forage production with animal needs)

Nick Hill, Dept. Crop and Soil Sciences, Athens

THE GRAZING RESOURCE INVENTORY

Goals
- What are my goals for the grazing system?
- Land and Soils
  - What land resources are available for the grazing operation?
  - What is the productivity of the soils?
  - Are there sensitive land areas or soil limitations for grazing in the pasture?
- Forage
  - What are the existing forage species in the pasture?
  - How healthy are they in what condition is the pasture?
  - What are the estimated yields and seasonal distribution of the existing forages?
  - How does quality of forage change with age of the plant?
- Livestock
  - What are the forage requirements for each livestock herd?
  - What are the plans for potential expansion of the livestock operation?
  - How many herds will be grazed? Water Sources
  - What are the existing water sources and where are the drinking facilities?
  - What are the other potential water sources?
- Fence
  - What are the types and condition of the existing fences?

Step 1. Match forages with climatic regime

Forage Species Adapted to North Georgia

Forage Trial vs. Farm Yields

<table>
<thead>
<tr>
<th>Species</th>
<th>Exp. Yield</th>
<th>Likely Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Potential (hay)</td>
<td>Potential (graze)</td>
</tr>
<tr>
<td>Common Bermudagrass</td>
<td>8,000</td>
<td>5,400</td>
</tr>
<tr>
<td>Hybrid Bermudagrass</td>
<td>22,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>10,000</td>
<td>7,500</td>
</tr>
<tr>
<td>Sorghum/Sudangrass</td>
<td>10,000</td>
<td>6,500</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>8,000</td>
<td>4,800</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>7,500</td>
<td>3,500</td>
</tr>
<tr>
<td>Winter annual grasses</td>
<td>4,500</td>
<td>3,400</td>
</tr>
</tbody>
</table>

Dr. Nick Hill
Professor, Forage Management

THE UNIVERSITY OF GEORGIA
College of Agricultural & Environmental Sciences
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Production curves of various forages in Georgia

Lesson Learned: Mixing species does not increase yield, rather the distribution of growth is an average of the two.

Forage Yield and Quality Are Inversely Related

..... Even In Drought

Dr. Nick Hill
Professor, Forage Management
Forage Quality Decreases with Maturity Because of Increased Fiber **AND** Decreased Fiber Digestibility

Cellulose in primary cell wall

Lignified in secondary cell wall

Forage Quality Decreases with Maturity Because of Increased Fiber **AND** Decreased Fiber Digestibility

But be careful how you use the grass as you can adversely affect both pasture and grazing animal.

### Interpreting Forage Trial Information for the Farm – Calculating How Many Animals the Forage will Support

<table>
<thead>
<tr>
<th>Species</th>
<th>Exp. Yield Potential (hay)</th>
<th>Likely Yield Potential (graze)</th>
<th>Animal Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Bermudagrass</td>
<td>8,000</td>
<td>5,400</td>
<td>192</td>
</tr>
<tr>
<td>Hybrid Bermudagrass</td>
<td>16,000</td>
<td>9,000</td>
<td>321</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>10,000</td>
<td>7,500</td>
<td>267</td>
</tr>
<tr>
<td>Sorghum/Sudangrass</td>
<td>10,000</td>
<td>6,500</td>
<td>232</td>
</tr>
<tr>
<td>Tall Fescue</td>
<td>8,000</td>
<td>4,800</td>
<td>172</td>
</tr>
<tr>
<td>Orchardgrass</td>
<td>7,500</td>
<td>3,500</td>
<td>125</td>
</tr>
<tr>
<td>Winter annual grasses</td>
<td>6,500</td>
<td>3,400</td>
<td>121</td>
</tr>
</tbody>
</table>

*Assumptions: cow = 1400 lbs, consumption = 2.0% bw; stocker wt. = 650 lbs, consumption = 3.5% bw

How different forages match up with different needs of animal classes?

Can We Extend the Grazing Season Beyond the Normal Growth Periods of the Pasture Species?

What are the options?
- Overseeding warm season grasses
- Use crop residues
- Fall save tall fescue
- Graze hay fields that have residue

Can We Extend the Grazing Season Beyond the Normal Growth Periods of the Pasture Species?

Overseeding warm season grasses: Facts from an on-farm grazing research project
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Forage Distribution Curves for Bermudagrass and Rye/Ryegrass grown on-farm (Wrens, GA)

Combined Forage Production Curve

Matching Forage Production with Cow Needs

Production = 19729 lbs/A
Cow needs = 12390 lbs/A
Therefore, adjust stocking rate (1.5-1.6 animals/A)

Matching Forage Production with Cow Needs (stocking rate adjusted to 1.5 cows/A)

Production = 19729 lbs/A
Cow needs = 18165 lbs/A

What other options do we have besides overseeding bermudagrass with winter annuals?

2. Crop Residues

Nutritional characteristics of corn residue components

<table>
<thead>
<tr>
<th>Plant parts</th>
<th>Husk</th>
<th>Leaf</th>
<th>Stem</th>
<th>Cob</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of DM</td>
<td>12</td>
<td>27</td>
<td>49</td>
<td>12</td>
</tr>
<tr>
<td>% CP</td>
<td>3.6</td>
<td>7.8</td>
<td>4.5</td>
<td>2.2</td>
</tr>
<tr>
<td>% digest.</td>
<td>67</td>
<td>47</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Palatability</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>low</td>
</tr>
</tbody>
</table>

Wilson et al., Univ. of NE

What other options do we have besides overseeding bermudagrass with winter annuals?

3. Fall save Tall Fescue

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Can We Extend the Grazing Season Beyond the Normal Growth Periods of the Pasture Species?

Why would we want to?

1. Less accumulation of manure.
2. Weather less of a concern
3. Higher quality forage
4. Less Labor – you don’t have to pay these laborers

What other options do we have besides overseeding bermudagrass with winter annuals?

4. Graze hay fields – cutting may not be worth the time and effort, so let the cows do the work!

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Can We Extend the Grazing Season Beyond the Normal Growth Periods of the Pasture Species?

Why would we want to?

5. Lower Expenses
   • Hay may account for 25% of cost of production

<table>
<thead>
<tr>
<th>Item</th>
<th>Overseeded Bermuda</th>
<th>Stockpiled Tall Fescue</th>
<th>Corn clover</th>
<th>Hay</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/cow/day</td>
<td>100%</td>
<td>4%</td>
<td>23%</td>
<td>46%</td>
</tr>
<tr>
<td>Days of use</td>
<td>130 hay</td>
<td>70 hay</td>
<td>90 grass</td>
<td>40 hay</td>
</tr>
<tr>
<td>Winter cost</td>
<td>100%</td>
<td>71%</td>
<td>41%</td>
<td>63%</td>
</tr>
</tbody>
</table>

Daily and seasonal forage costs for wintering strategies based on a 100-cow herd. Winter feeding from 1 December to 10 April.

Gerrish, Univ. of MO