Forage management applied

MARCELO WALLAU & LILIANE SEVERINO DA SILVA
ASSISTANT PROFESSOR FORAGE EXTENSION SPECIALIST
PH.D. CANDIDATE AGRONOMY DEPARTMENT

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Pasture management

Rotational vs. continuous stocking

Intensive grazing

Heavy fertilization

Improved hybrids and expensive seed

Irrigation

First Concepts & Planning
The reality
But with simple concepts and a management plan we can do a lot to improve our production.
Concept #1

Carrying capacity and stocking rate

The basis to make sure we have enough forage for our cattle.
Carrying capacity – maximum number of animals or animal units that your pastures can support in order to achieve a targeted animal performance without compromising the pasture (Allen et al., 2011)

And carrying capacity has to be your determinant for stocking rate.
**Stocking rate** – the actual number of animals or animal units per area based on total land (e.g. AU/A)

**Stocking density** – the relationship between number of animals and specific unit of land being grazed (e.g. AU/A)
<table>
<thead>
<tr>
<th>Site</th>
<th>N rate</th>
<th>Argentine</th>
<th>Pensacola</th>
<th>UF Riata</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainesville</td>
<td>180</td>
<td>10,800</td>
<td>9,300</td>
<td>8,400</td>
<td>Interrante et al., 2009</td>
</tr>
<tr>
<td>Ona</td>
<td>50</td>
<td>4,800</td>
<td>4,100</td>
<td>4,900</td>
<td>Vendramini et al., 2014</td>
</tr>
<tr>
<td>Ona</td>
<td>100</td>
<td>10,000</td>
<td>9,200</td>
<td>-</td>
<td>Mislevy et al. 2005</td>
</tr>
</tbody>
</table>

How much our bahiagrass pastures produce?
How much forage can I count on?

Rule of thumb – use 50-60% of accumulation rate – respect minimum stubble
Temperate annual pastures can tolerate up to 70% harvest efficiency
Tropical rangelands between 20 and 25%
9,000 lb DM/A → 50% grazing efficiency

= 4,500 lb DM/A available

1,100-lb cow eating 2.5% body weight per day = 27.5 lb DM/D

27.5 lb DM/D x 170 days = 4,675 lb/DM

~ 1 AU/A
Carrying capacity
Bahiagrass growth

Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec

Understocked

Overstocked

Overstocked

1 AU
<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>UNIT</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbage accumulation rate</td>
<td>lb DM/A d^{-1}</td>
<td>28</td>
<td>41</td>
<td>59</td>
<td>50</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Days</td>
<td></td>
<td>31</td>
<td>30</td>
<td>31</td>
<td>31</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Total DM production</td>
<td>lb DM/A</td>
<td>865</td>
<td>1242</td>
<td>1814</td>
<td>1535</td>
<td>351</td>
<td>446</td>
</tr>
<tr>
<td>DM available (50% total)</td>
<td>lb DM/A</td>
<td>432</td>
<td>621</td>
<td>907</td>
<td>767</td>
<td>176</td>
<td>223</td>
</tr>
<tr>
<td>1100-lb cow needs (27.5 lb DM d^{-1})</td>
<td></td>
<td>853</td>
<td>825</td>
<td>853</td>
<td>853</td>
<td>825</td>
<td>853</td>
</tr>
<tr>
<td>Pasture needed</td>
<td>acres/AU</td>
<td>2.0</td>
<td>1.3</td>
<td>0.9</td>
<td>1.1</td>
<td>4.7</td>
<td>3.8</td>
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<tr>
<td>Monthly Carrying Capacity</td>
<td>AU/A</td>
<td>0.5</td>
<td>0.8</td>
<td>1.1</td>
<td>0.9</td>
<td>0.2</td>
<td>0.3</td>
</tr>
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</table>
Dealing with seasonality

Flatten the curve

Harvest excess
Effect of fertilization on herbage production

Herbage accumulation rate (lb DM/A.d)

May  Jun  Jul  Aug  Sep  Oct

Low 40 N
Medium 120 N
High 360 N

Stewart et al., 2007
Increase stocking density and harvesting the excess

**Spring**
- Grazing all area

**Summer**
- Grazing 2/3
- Hay or stockpile 1/3

*Same stocking rate but increased stocking density*
Hay production

Cheap insurance but expensive supplement

Good quality hay can save money!

Hard to make good hay on rainy FL summer - wrapping?
## Forage Budget

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Initial herbage mass</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herbage accum. rate</td>
<td>lb DM/A d⁻¹</td>
<td></td>
<td>28</td>
<td>41</td>
<td>59</td>
<td>50</td>
<td>12</td>
<td>14</td>
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<td>Days</td>
<td></td>
<td></td>
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<td>1814</td>
<td>1535</td>
<td>351</td>
<td>446</td>
</tr>
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</table>

Total intake

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total intake</td>
<td>lb DM/A</td>
<td>853</td>
<td>825</td>
<td>853</td>
<td>853</td>
<td>825</td>
<td>853</td>
</tr>
</tbody>
</table>

Cumulative biomass

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative biomass</td>
<td>lb DM/A</td>
<td>1200</td>
<td>1553</td>
<td>2300</td>
<td>3602</td>
<td>4625</td>
<td>4481</td>
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</table>

Total intake

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total intake</td>
<td>lb DM/A</td>
<td>1449</td>
<td>1403</td>
<td>1449</td>
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Cumulative biomass
Bahiagrass only

Herd requirements

Feeding hay

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
Concept #2

Diversity

More grazing days and opportunity to improve animal performance
Better matching production needs (demand) and forage production (supply)
Farm mosaic

A 15% prepared ground for Sorghum and oat/ryegrass

Bermudagrass hayfield

Main forage crop bahiagrass

Wet area with limpograss for stockpiling
What forage to use?

What are the needs?

Which forage species better fits the system/environment?

What is the level of investment and involvement?

Define objective
Setting production goals

Adapted from Lippke and Riewe (1976) and Ball et al. (2015)
Concept #3

Grazing management

How does defoliation influence on animal performance and pasture growth?

Picture credit: Noble Institute
Plant growth curve

- Lag phase
- Exponential phase (Maximum growth)
- Stationary phase

Time (Biomass)
Normal growth with correct management

Overgrazed – delay and reduction of productivity
Heavy grazing  Moderate grazing  Light grazing

Source: Lynn Sollenberger
A mouth full of grass

Adequate forage will allow animals to graze at full potential
Herbage accumulation rate = 55 lb/acre.day

Herbage accumulation rate = 35 lb/acre.day

Average daily gain 153% greater
Gain per area 43% greater

Pictures and data from Savian, 2017
Recapping

Plan to make sure you have enough - budget

Don’t put all eggs in one basket - diversify

Leave grass behind, so you can make more grass - defoliation
Summing up!

These concepts are crucial to establish a plan for your system.

Planning is a powerful tool that confers flexibility to the system to overcome possible challenges.

Forage budget may require some calculation but is simple and will help to achieve herd requirements.
Great education opportunity and learning tool, while competing for some great prizes.

Prove Your Hay is the Best.
Participate in the Southeastern Hay Contest and showcase your high quality hay for a chance to win great prizes and recognition.
Questions?

mwallau@ufl.edu