Forage Systems for Small Ruminants

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VALUE OF FORAGE

- Cheapest feed for our livestock.
- 365 days of grazing.
- Maintain soil structure.
- Aesthetically pleasing.

Sheep lead all farm animals in their ability to produce marketable products on forage alone.

TYPES OF FORAGE

- Browse: Leaves/tips of woody shrubs or trees.
- Forbs: Broadleaf plants, not grasses. Certain "weeds".
- Grass: Produce the most biomass. Most predominant.

WHAT DO OUR ANIMALS PREFER?

- Sheep: Grazers
  - Grass
  - Forbs
- Goats: Browsers
  - Browse
  - Grass
  - Forbs

Sheep and goats are more selective than other livestock.
- Physical limitation on how much they can consume & process - quality in each bite important.

NUTRITIONAL DEMAND: SHEEP

<table>
<thead>
<tr>
<th>Sheep Nutrient Requirements</th>
<th>Crude Protein (CP) %</th>
<th>Total Digestible Energy (TDE) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rams (220 lb. Maintenance)</td>
<td>2% BW 7%</td>
<td>53%</td>
</tr>
<tr>
<td>Dry ewe (132 lb.) 2% BW</td>
<td>7%</td>
<td>53%</td>
</tr>
<tr>
<td>Late gestation 2.5% BW</td>
<td>15%</td>
<td>67%</td>
</tr>
<tr>
<td>Weaning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early maturing 5% BW</td>
<td>12%</td>
<td>75%</td>
</tr>
<tr>
<td>Late maturing 3% BW</td>
<td>15%</td>
<td>66%</td>
</tr>
<tr>
<td>Yearling ewes 2% BW</td>
<td>8%</td>
<td>66%</td>
</tr>
</tbody>
</table>

% BW is all feed/forage eaten on dry matter basis as % of their body weight (NRC, 2007)

NUTRITIONAL DEMAND: GOATS

<table>
<thead>
<tr>
<th>Goat Nutrient Requirements</th>
<th>Crude Protein (CP) %</th>
<th>Total Digestible Energy (TDE) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bucks (100-220 lb. Maintenance)</td>
<td>2% BW 7%</td>
<td>54%</td>
</tr>
<tr>
<td>Dry doe (88-154 lb.) 2% BW</td>
<td>7%</td>
<td>53%</td>
</tr>
<tr>
<td>Late gestation 2.5% BW</td>
<td>13%</td>
<td>66%</td>
</tr>
<tr>
<td>Early lactation 3% BW</td>
<td>13%</td>
<td>53%</td>
</tr>
<tr>
<td>Growing kids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boer 4% BW</td>
<td>25%</td>
<td>60%</td>
</tr>
<tr>
<td>Local 3.4% BW</td>
<td>21%</td>
<td>89%</td>
</tr>
<tr>
<td>Yearlings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% BW is all feed/forage eaten on dry matter basis as % of their body weight (NRC, 2007)
### NUTRITION OF FORAGES

<table>
<thead>
<tr>
<th>Forage</th>
<th>CP %</th>
<th>TDN %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahiagrass</td>
<td>8-11%</td>
<td>50-54%</td>
</tr>
<tr>
<td>Bermudagrass</td>
<td>9-11%</td>
<td>50-58%</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>8-14%</td>
<td>50-58%</td>
</tr>
<tr>
<td>Sunn Hemp</td>
<td>25-30%</td>
<td>65-71%</td>
</tr>
<tr>
<td>Cogongrass</td>
<td>10-14%</td>
<td>55-60%</td>
</tr>
<tr>
<td>Annual Rye</td>
<td>10-17%</td>
<td>50-61%</td>
</tr>
<tr>
<td>Oats</td>
<td>10-14%</td>
<td>50-62%</td>
</tr>
<tr>
<td>Red Clover</td>
<td>14-16%</td>
<td>57-62%</td>
</tr>
</tbody>
</table>

### Lifecycle of Plants

**Warm-season plants**
- In FL: This dominates as a perennial.

**Cool-season plants**
- In FL: This can close a gap in forage as planted annuals.

**Perennial**
- A plant that comes back every year without needing to be re-seeded.

**Annuals**
- A plant that completes its life cycle in one year and needs to be re-seeded each year.

### QUALITY OF FORAGE

- **Perennial**
  - Summer Grass
  - Winter Legume & Broadleaf

- **Annual**
  - Winter Grass

Increasing Forage Quality

![Pasture Base Image] (Texas A&M Extension)

### PASTURE BASE

- This is what we tend to depend on the most.
- Options are based on environment.
- In FL:
  - Warm-season Perennial
  - Bermudagrass probably, maybe sunn hemp
  - Other “volunteer” species, i.e. weeds

### ADDING TO YOUR BASE: DIVERSITY

- Annuals, plant each year.
- Provide added forage.
- Improved quality, generally.
- What do you need from annuals?
  - Quality: Production animals needing added nutrition.
  - Quantity: Wanting to increase stocking rate.
  - Time of year these goals need to be met?
  - Warm season annual or cool season annual? Both?

### WHAT TO PLANT

- Depends on your needs, intended management, and environment.
- Assess the situation of your farm:
  - What period of time are you looking to graze?
  - What are the conditions of your soil?
  - How invested are you willing to be?
  - What grazing management tactics will you use?
SPECIES COMPLEMENTATION

WARM-SEASON ANNUALS

- Overlap our pasture base.
- Opportunities:
  - Increase stocking density
  - Increase quality of forage offered
  - Diversify forage options
  - Cover crop for grazing- operation outside of perennial pasture

WARM-SEASON ANNUAL OPTIONS

- Crabgrass
- Pearl millet
- Sorghum-sudan
- *Sericea lespedeza (perennial)

ESTABLISHMENT OF WARM-SEASON ANNUALS

- Planting window:
  - April 1st - June 30th possibly a little later for some.
  - Need moisture!
- Before you plant:
  - Assess your soil
  - Weed management
  - Choose the right species for your region and management
  - Decide how you will plant- no-till, broadcast (overseed), fully prepared seedbed.
  - Plan to fence off the area or keep animals off for establishment
- After planting:
  - Fertilization- (30 lb. N, 50% K, all P)
  - Grazing management

GRAZING MANAGEMENT

- Make your investment in annual forages worth while!
- Manage grazing to achieve multiple grazing "events".
- Stocking rates?
- Prussic acid concerns
- Warm season annuals: 45-60 days post planting to grazing.
  - Millet- graze at 18", down to 9-12"
  - Crabgrass- graze at 8", down to 3"
  - Sorghum-sudan- graze at 24", down to 10"
  - Legumes- graze at 8-12", down to 4"
- Green makes more green!
- "Take half leave half"

COOL-SEASON ANNUALS

- Complement our pasture base.
- Opportunities:
  - Help close forage gaps.
  - High quality forages to meet nutritional demands.
  - Keeps soil active.
  - Aesthetically pleasing.
COOL-SEASON ANNUAL OPTIONS

- Small grains
  - Oat
  - Rye
  - Wheat
  - Triticale

- Ryegrass
  - Early and later maturing varieties

- Legumes
  - Closers (wet vs. dry conditions)
    - White, ball, crimson, red, arrowleaf
  - Winter pea
  - Vetch

- Brassicas
  - Chicory
  - Rape
  - Turnip
  - Radish

ESTABLISHMENT OF COOL-SEASON ANNUALS

- Planting window:
  - October-early December
  - Dependent on your region
  - Moisture

- Before planting:
  - Select the right forages for you
  - Refer to a soil test
  - Consider competition
  - How will you plant? Will this work?
  - Plan for your animals during the establishment window

- After planting:
  - Fertilization (30 lb. N, 50% K, all P)
  - Grazing management

GRAZING MANAGEMENT

- Goal is multiple grazing events.
- Most forages are ready to graze 60-120 days post planting.
- Order of grow: Brassicas, small-grains, ryegrass & clovers.
  - Think of this when selecting what to plant!
- Stocking rates?
- Allow forages to reach 6-12" before grazing, don’t graze below 3".
- Take 40-50%, leave 60-40%, better for the plant and the animal.

Managing Potential Issues

- Competition:
  - Don’t plant too early: Increased weed & disease pressure
  - Prepare the seedbed!
  - Light herbicide

- Legume (clover) inoculation:
  - If buying pre-inoculated seed, ensure proper seed storage and shelf life!
  - If adding inoculant, choose the correct one and mix just prior to planting.

Buying Quality Seed:

- Don’t buy the cheapest seed, buy quality seed that is,
  1.) recommended for the conditions you intend to plant
  2.) Certified: germ tested and contamination rate
- Use EDIS: Cool-Season Forage Variety Recommendations for FL.

IN SUMMARY

- Forage can meet nutritional demands of small ruminants during many times of the year.
- Consider your environment and personal goals.
- Select a forage system that complies.
- Prepare for planting.
- Manage grazing.

Thank You