Agronomy Forage Research Update

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Outline

- Statewide Agronomy Forage Management and Breeding Team
- Problems Being Addressed and Outcomes
Forage Breeding Team
Problems Being Addressed

Short term

- Cool-season forage supply
- Nitrogen fertilizer cost on grass-based systems
- Bahiagrass decline
- Warm-season grass alternatives
Problems Being Addressed

Longer term
- Breeding Florida-adapted varieties of important forage species
- Effects of forage systems on the environment
Problem: Cool-season Forage Supply

- Limpograss
- Ryegrass, small grains, and clovers
Limpograss Breeding

50 new limpograss hybrids produced (Quesenberry and Blount)
Agronomy Forage Research Unit – north of Gainesville
Limpograss Evaluation

8 hybrids selected for evaluation under grazing

Grazed every 2 or 4 weeks to 8 inches
Initial Grazing of Limpograss Hybrids
## Initial Grazing Evaluation at Beef Unit

<table>
<thead>
<tr>
<th>Limpograss entry</th>
<th>Year</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>2010</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tons/acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>3.3</td>
<td>3.0</td>
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<tr>
<td>4B</td>
<td>3.0</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td><strong>Kenhy</strong></td>
<td>4.4</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2.7</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td><strong>Gibtuck</strong></td>
<td>4.5</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>3.0</td>
<td>2.4</td>
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</tr>
<tr>
<td>32</td>
<td>3.6</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>3.6</td>
<td>3.0</td>
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</tr>
<tr>
<td><strong>Floralta</strong></td>
<td><strong>4.1</strong></td>
<td>3.3</td>
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Initial Grazing Evaluation at Beef Unit

<table>
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<tr>
<th>Limpograss entry</th>
<th>After 2 years of grazing</th>
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<tr>
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<td>Limpograss cover (%)</td>
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<tr>
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## Advanced Grazing Evaluation of Limpograss Hybrids at Beef Unit

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<thead>
<tr>
<th></th>
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<td>1</td>
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<td>32</td>
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# Stockpiling Yield, CP, & Digestibility

<table>
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<tr>
<th>Entry</th>
<th>Herbage yield (tons/acre)</th>
<th>Crude protein (%)</th>
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<td>3.2</td>
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<tr>
<td>Gibtuck</td>
<td>2.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Floralta</td>
<td>2.4</td>
<td>3.7</td>
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# Stockpiling Yield, CP, & Digestibility

<table>
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<tr>
<th>Entry</th>
<th>Yield (Mg ha(^{-1}))</th>
<th>Crude protein (%)</th>
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<td>Kenhy</td>
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<td>3.2</td>
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<tr>
<td>Gibtuck</td>
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<td>3.9</td>
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<td>Floralta</td>
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<table>
<thead>
<tr>
<th>Entry</th>
<th>Stockpiling period (wk)</th>
<th>Digestibility (%)</th>
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<td>52.8</td>
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<tr>
<td></td>
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</table>
Summary and Recommendations

- **Kenhy**
  - May be the best for stockpiling

- **Gibtuck**
  - May be the best for more regular grazing or hay production during the growing season
Current Status

Kenhy and Gibtuck released July 2014 to selected growers throughout the state for increase.

Planting material available for general distribution from at least some of these growers later this year.
Problem: Cool-season Forage Supply

Ryegrass, small grains, and clovers
Annual Ryegrass Breeding

Breeding program of Kevin Kenworthy
Annual Ryegrass Breeding

Disease Resistance
– Crown Rust and Grey Leaf Spot

Crown rust susceptible
Crown rust resistant
Annual Ryegrass Breeding

Objectives:

- Maturity Dates
  - Early and late maturing varieties for different uses
Small Grains Program

Dr. Blount’s Breeding Program Goals

- Rust resistance of oat
- Early-growing and high yielding triticale for harvested forage
- Earlier and more leafy rye
Cool-Season Legumes

- New Releases
  - White Clover
  - Red Clover
White Clover

- Ocoee - seed coming on line; superior nematode resistance, yield, and rooting characteristics
Red Clover

Status
2,4-D resistant red clover (FL24D) released 2014
Will be licensed this year

Not Sprayed

Sprayed with 2,4-D
Problems Being Addressed

Short term
– Cool-season forage shortage

– Nitrogen fertilizer cost on grass-based systems

– Bahiagrass decline

– Warm-season grass alternatives
Rising Cost of Nitrogen

Price Per Ton

From USDA ARS
Use of Legumes

Strategy to reduce N fertilizer inputs:

Warm-season

Cool-season
Perennial Peanut - Primarily a Hay Crop
Perennial peanut pasture for beef cattle?

$\ldots\ldots\ldots\ldots\ldots$
Mixed pastures have survived 50 yr at Brooksville and > 30 yr at Gainesville with > 30% legume.
The approach

Strip width: 13 feet

1 2 3 4 5 6 7 8

20 inches between rows of rhizoma peanut

10 inch border
Planting process
On-farm trials – Perennial peanut

- Two establishment methods x two PP varieties
- Four locations in Florida
Several **cool-season legume** trials carried out since Oct. 2013:

- Red clover variety trial
- White clover variety trial
- Alfalfa trials
- 2,4-D clover
- Screening of cool-season legumes
- Novel legumes and their potential in FL
- Reseeding potential of cool-season legumes
- Seed rate of ball clover in ryegrass mixtures
- Rye/ryegrass or ryegrass mixed with different legumes
- Grazing trial - mixtures
Establishment of long-term grazing trial at Marianna

1) Grass-legume based system

2) Grass in the warm-season (without N fertilizer) and grass-legume in the cool-season

3) Grass-N fertilizer in both seasons
Problems Being Addressed

Short term
- Cool-season forage supply
- Nitrogen fertilizer cost on grass-based systems
- Bahiagrass decline
- Warm-season grass alternatives
Bahiagrass Decline

- Pastures with weak bahiagrass sampled throughout the state

- Data collected on management practices, plant and soil characteristics

- Data synthesis ongoing in an attempt to establish causal factors
Problems Being Addressed

Short term

- Cool-season forage shortfall
- Nitrogen fertilizer cost on grass-based systems
- Bahiagrass decline
- Warm-season grass alternatives
Warm-season Perennial Grasses

- Jiggs bermudagrass and Mulato brachiariagrass
What we have learned so far

- No evidence that Jiggs is less cold tolerant in North Florida than T-85
- Jiggs is more productive using a shorter cutting height than T-85
- Jiggs is easier to establish and tolerates wetter soils than T-85
- Jiggs is less digestible than T-85
What we have learned so far

- Mulato is slower to grow in spring, grows longer in fall, and yields as much as Jiggs or T-85

- Mulato has higher digestibility than either Jiggs or T-85

- Mulato consistently survives two North Florida winters, but all bets are off after that

- Mulato is not tolerant of poorly drained soils
Problems Being Addressed

Longer term

- Need for Florida adapted varieties of important forage species

- Effects of forage systems on environment
Breeding Alfalfa for Florida

Rationale

Breeding objectives
1. Persistence high yield and disease resistance
Breeding Alfalfa for Florida

**Status**

**Location:** Citra

**Cumulative Yr1 (lb/A):**
7 tons/A – 2 in
6 tons/A – 4 in

**NFH Yr1**
9 tons/A

**Testing 28 varieties**
In 2 FL sites
overseeded in bermudagrass
Alfalfa no-till drilled on bahiagrass and Tifton-85
Breeding Bermudagrass for Florida

Rationale
Very important warm-season forage in Florida - High yield
Challenges: Pasture decline, stem maggot, yield distribution, quality, no commercial cultivars developed in FL

Breeding objectives
1. High yield and quality
2. Improve seasonal yield distribution
Breeding Bermudagrass for Florida

Status
Testing ~300 experimental lines from the core collection from Tifton and the USDA Germplasm Center (GRIN)

Six locations:

Ona, FL
Citra, FL
Marianna, FL
Tifton, GA
Ardmore, OK
North Carolina
Breeding Red Clover for Florida

Rationale
High quality and versatile
Legume for cool-season mixtures – late-season production
Challenges: Establishment, yield and yield distribution

Breeding objectives
1. Fast establishment, yield and yield distribution
Problems Being Addressed

Longer term
- Need for Florida adapted varieties of important forage species
- Effects of forage systems on environment
Forage Systems and Soil Carbon

Perennial forage base: Rhizoma peanut vs. T-85

Utilization method: Hay vs. pasture

With or without cool-season forage
Legumes vs. N fertilizer effects on environment

1) Grass-Legume based system

2) Grass in the warm-season (without N fertilizer) and grass-legume in the cool-season

3) Grass system based on N fertilizer in both seasons
Where are we today?

The Agronomy forage team is better staffed than for several years (aided by LBR), but needs to refill the extension position in Gainesville

Although some are showing their age, we have good facilities throughout the state to do forage research
Where are we today?

We will continue addressing the most pressing forage problems of the industry by leveraging funding from several sources to address a broad range of production, environment, and basic science questions.
UF/IFAS Forage Program