Introduction

Grassland species are declining
- habitat loss
- habitat degradation
- agricultural intensification

51 million acres of pasture/hay in the Mid-South
- non-native forages
- dense stands
- homogenous

Source: Dimmick et al. 2002
Introduction

Many grassland species need **heterogeneity** in their habitat

- “improved” stands support only limited numbers of species
- lack vertical and horizontal structural diversity

Fuhlendorf and Engle 2001

Introduction

Non-native forages such as tall fescue provide benefits to producers:
- high stand persistence
- good yields during fall and spring

But...they also have problems:
- fescue toxicosis
- “summer slump”

Introduction

Typical yield curve for Tall Fescue

Ball and co-workers. 1996. Southern Forages
**Introduction**

Typical yield curve for Tall Fescue vs. WSG

Ball and co-workers. 1996. Southern Forages

**Introduction**

Native warm-season forages can provide:
- excellent gains May-August
- are drought tolerant
- can provide improved habitat for wildlife

All depends on grazing management

**Justification**

Lots of research on grazing native forages in the Mid-West and West
- few studies in the Mid-South
- these often exclude implications for wildlife
- many wildlife recommendations are incompatible with economic needs of producers
- integration is needed!
**NRI Project Goals**

1. Document grazing strategies for NWSG conducive to Mid-South beef cattle operations including stocking rates, weight gains, and stand persistence
2. Document preferred NWSG mixes beneficial to forage, biofuels production, and wildlife habitat
3. Identify wildlife habitat benefits associated with varying forage and biofuels management strategies
4. Identify optimum management strategies for integration of forage, biofuels, and wildlife habitat goals across a gradient of landowner objectives

**Goal:** Identify wildlife habitat benefits associated with varying forage and biofuels management strategies

**Objectives**

1. Evaluate habitat through plant community and structure analysis
2. Identify changes in invertebrate community and invertebrate availability in native grazing systems
3. Determine rates of northern bobwhite nest destruction using artificial nests in native grass grazing systems
4. Develop recommendations for enhancing habitat in native grass forage and biofuels feedstock production systems

**Study Area**

**Grazing Study:** Replicated at three sites

**Biofuels Study:** Replicated at three sites
**Hypotheses**

H₁: Vegetation structure and composition will differ among grazing treatments and forages.

H₀: Vegetation structure and composition will not differ among grazing treatments and forages.

H₂: Invertebrate species richness and abundance will differ among grazing treatments and forages.

H₀: Invertebrate species richness and abundance will not differ among grazing treatments and forages.

H₃: Artificial nest trampling rates will differ among grazing treatments and forages.

H₀: Artificial nest trampling rates will not differ among grazing treatments and forages.

**Study Design**

Two grazing strategies:
- Full-season, low density
  - 4-5 head, 100 days
- Short-duration, intensive
  - 6-8 head, 28 days
  - Weaned steers

Three NWSG forages:
- Big bluestem/indiangrass
- Eastern gamagrass
- Switchgrass

Three replicates per grazing/forage treatment per site
- 3-acre pastures
- Established in 2008
  - Some replanted in 2009
Study Design

Objective 1. Evaluate habitat through plant community and structure analysis

Methods

Vegetation sampling conducted twice:
– Early June
– Late July

Species richness collected along 10-m point transects
– 5 transects per pasture

Structure measured at each 10-m transect
Structural measurements include:
– vegetation height
– litter depth
– ground sighting distance
– cone of vulnerability
– disc of vulnerability
– vertical obstruction
Methods

Objective 2. Identify changes in invertebrate community and availability in native grazing systems

Invert sampling conducted July 2010
- terrestrial vacuum sampler
- 10 samples per pasture

Invert processing
- samples dried to constant mass
- separated from litter
- identified to family

Methods

Objective 3. Determine rates of northern bobwhite nest destruction using artificial nests in native grass grazing systems

10 artificial nests placed per pasture
- 12 eggs each
- marked with GPS and flagging
- checked every 5-7 days
- fate determined at end of 28 days
**Proposed Analysis**

Objectives 1, 2, and 3:
- nested CRD
- SAS® software
- $\alpha = 0.05$

Objective 3:
- Mayfield estimator

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**Future Direction**

Continue study in 2011

**Objective 4.** Develop recommendations for enhancing habitat in native grass forage and biofuels feedstock production systems

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Questions?