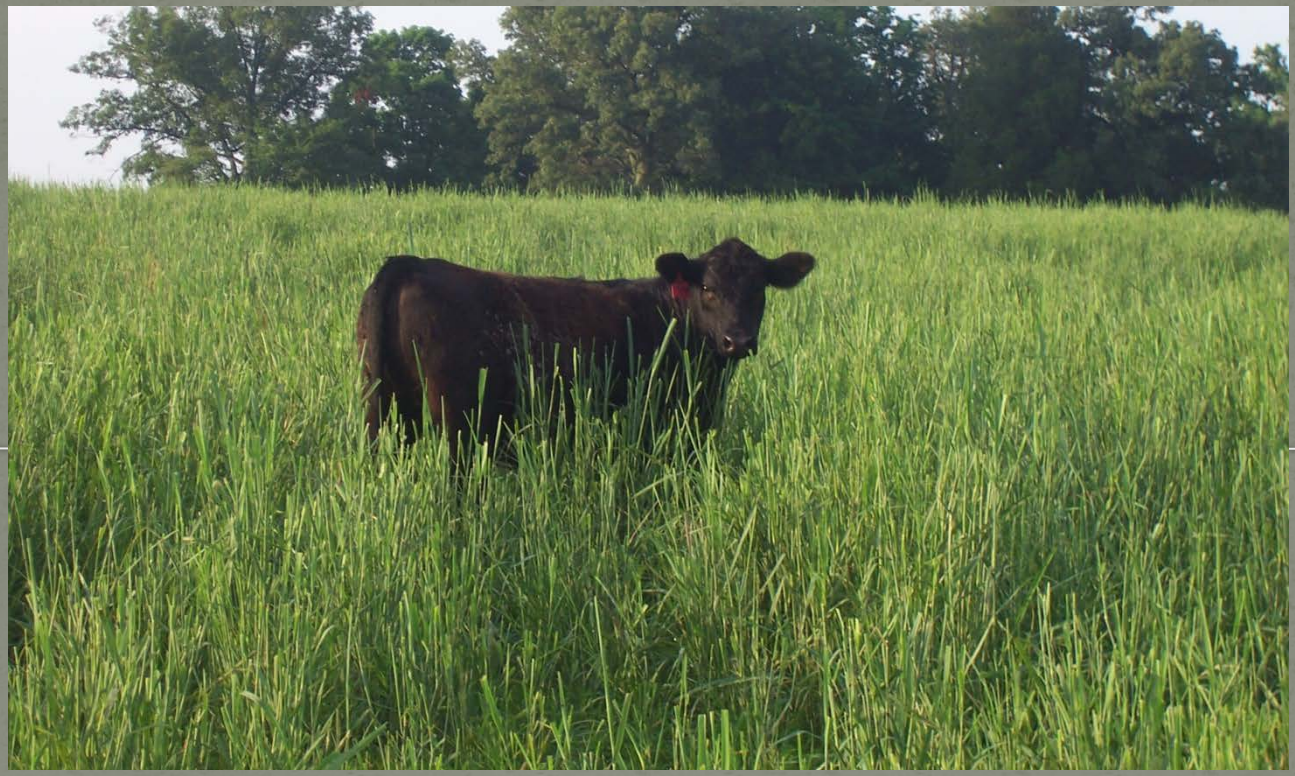
Forage Production with NWSG



P. Keyser, G. Bates. J. Waller, C. Harper
Center for Native Grasslands Management
University of Tennessee

Outline

- **Some Background**
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Biomass Footprint…

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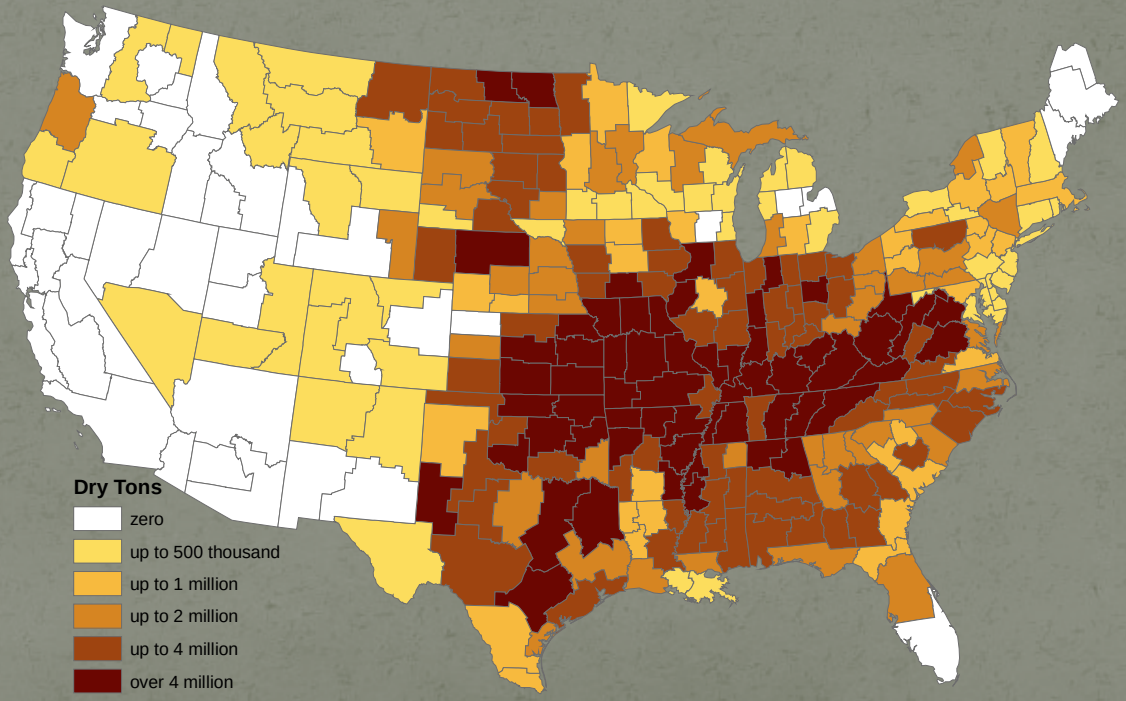

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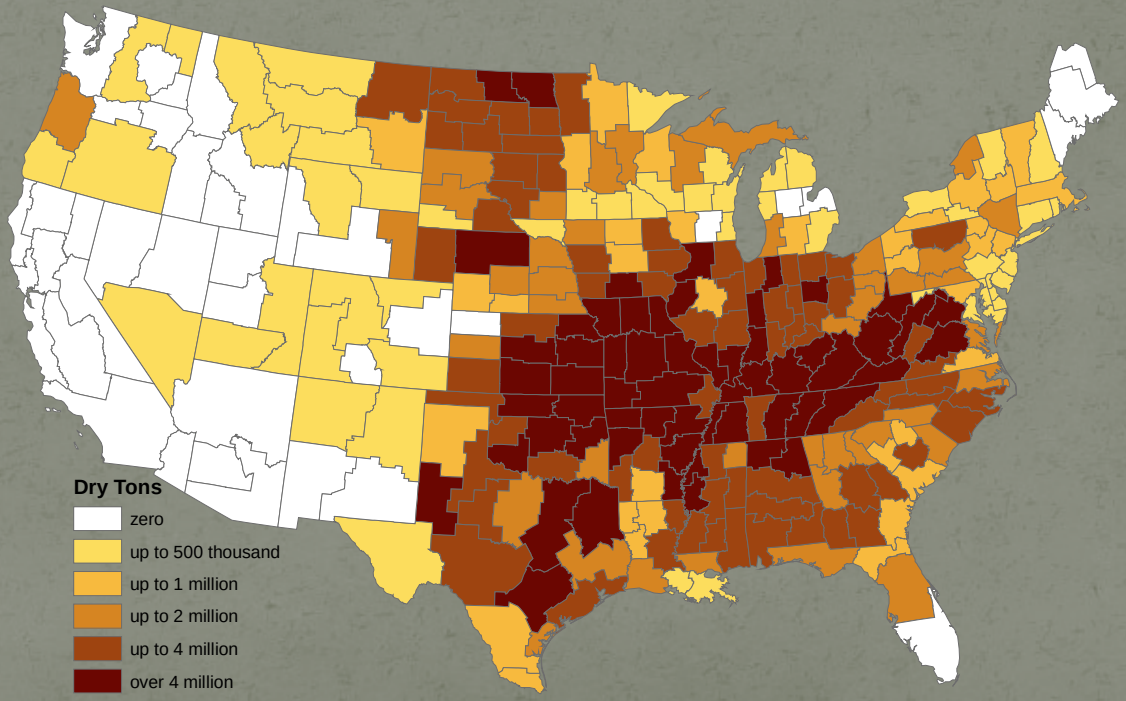

By 2025 35 - 55 million ac

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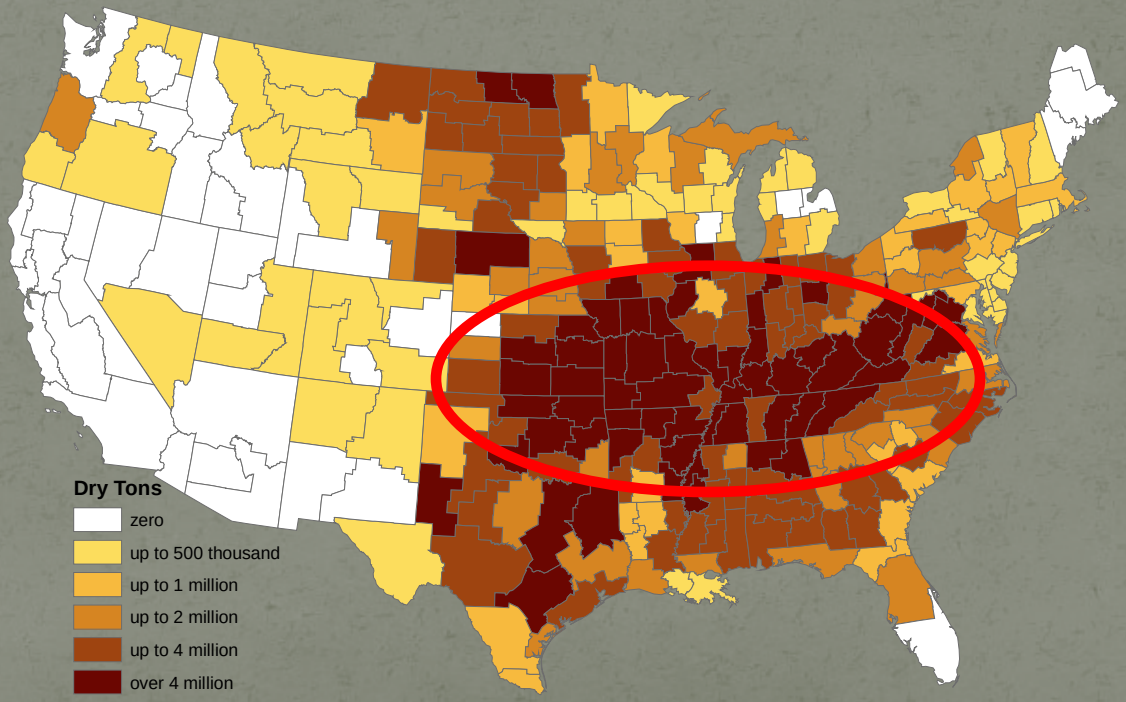

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Overlaid on "Grass-farming" Region

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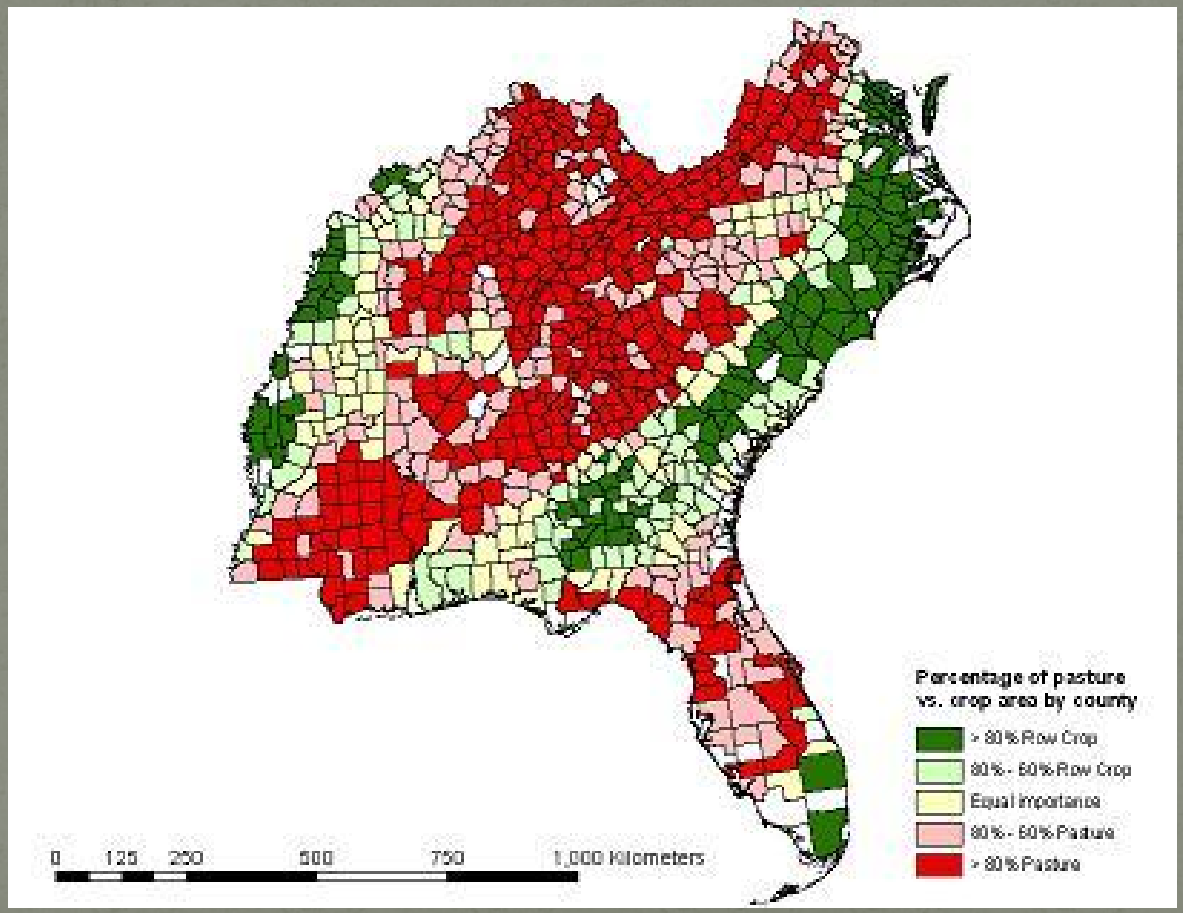

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Need for Improved Summer Forage...

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- **Drought tolerance (2007, 2008, 2012, ????)**

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- Offset potential biomass production impacts

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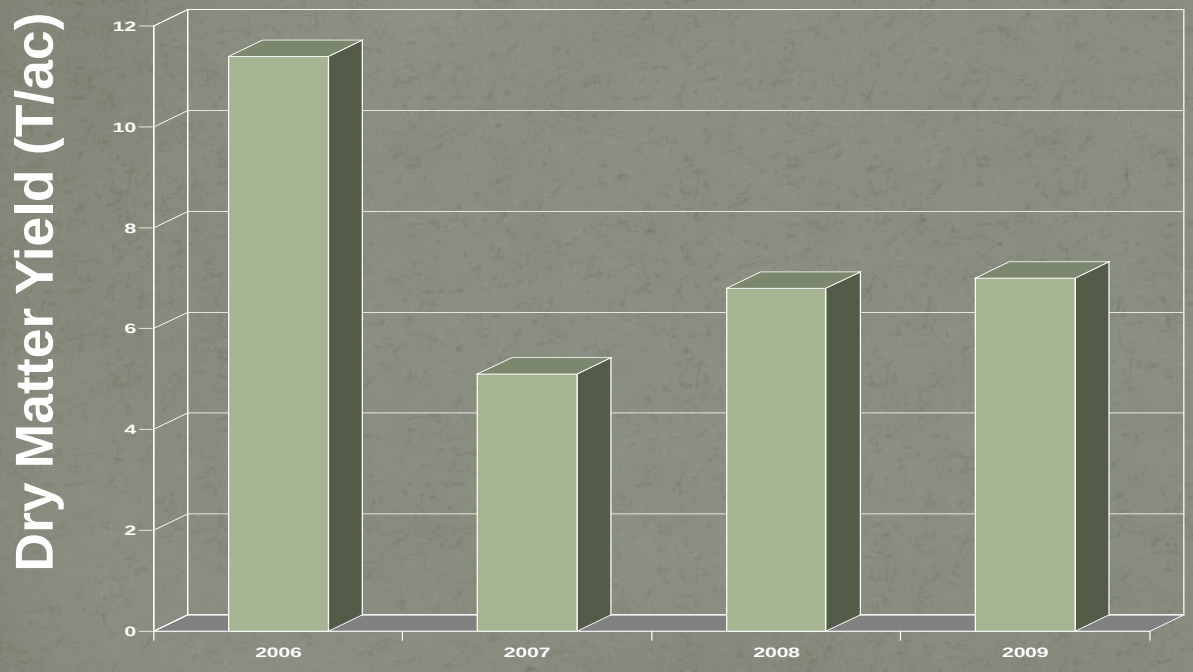
Exceptional Drought Tolerance



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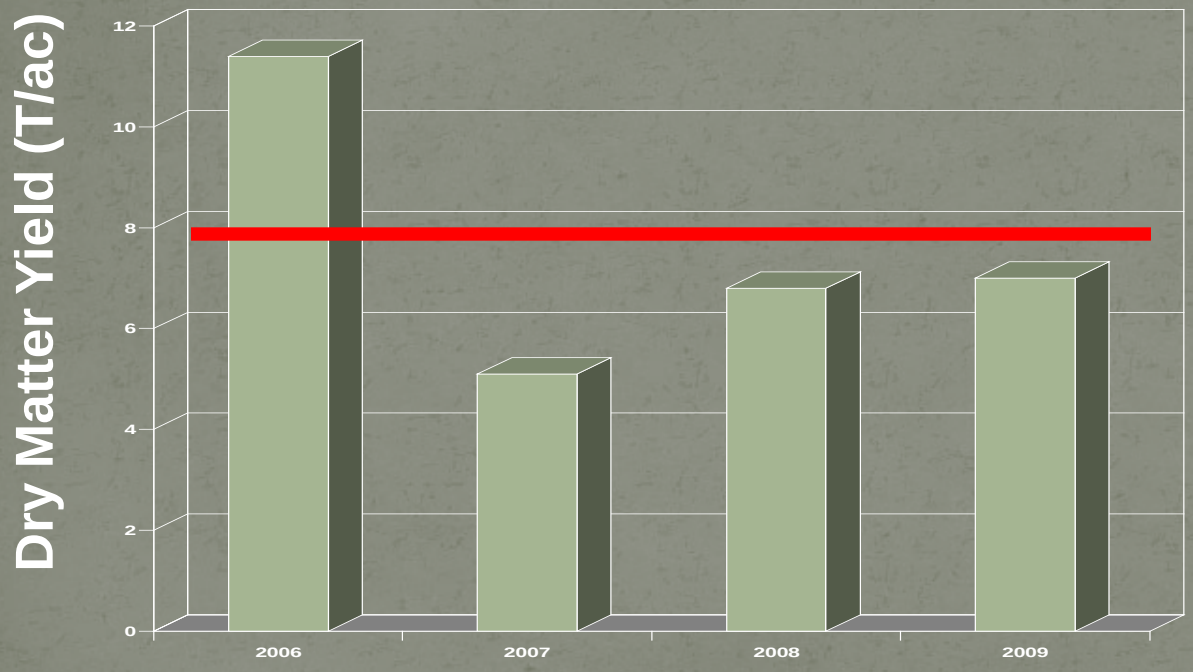

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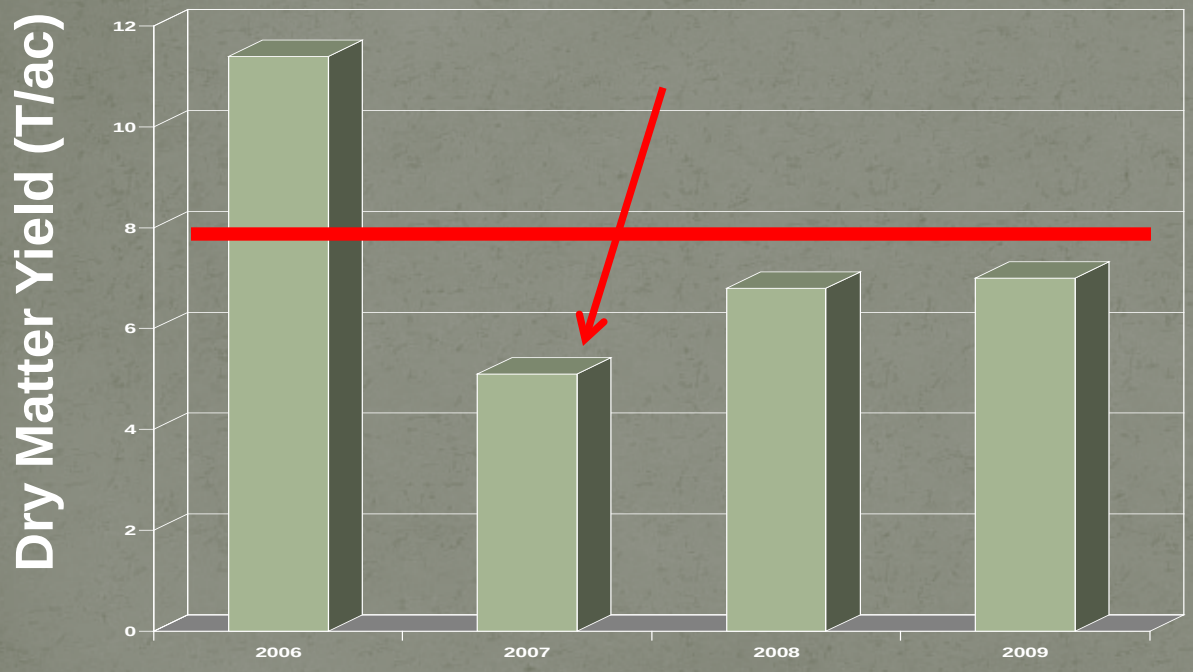

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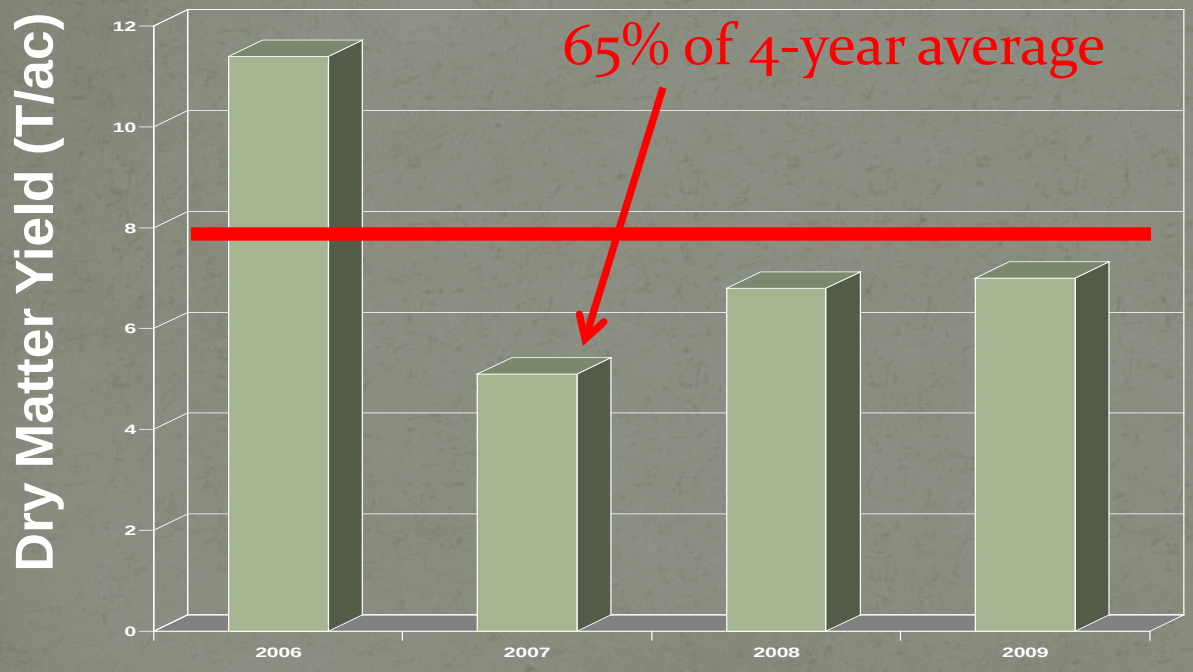

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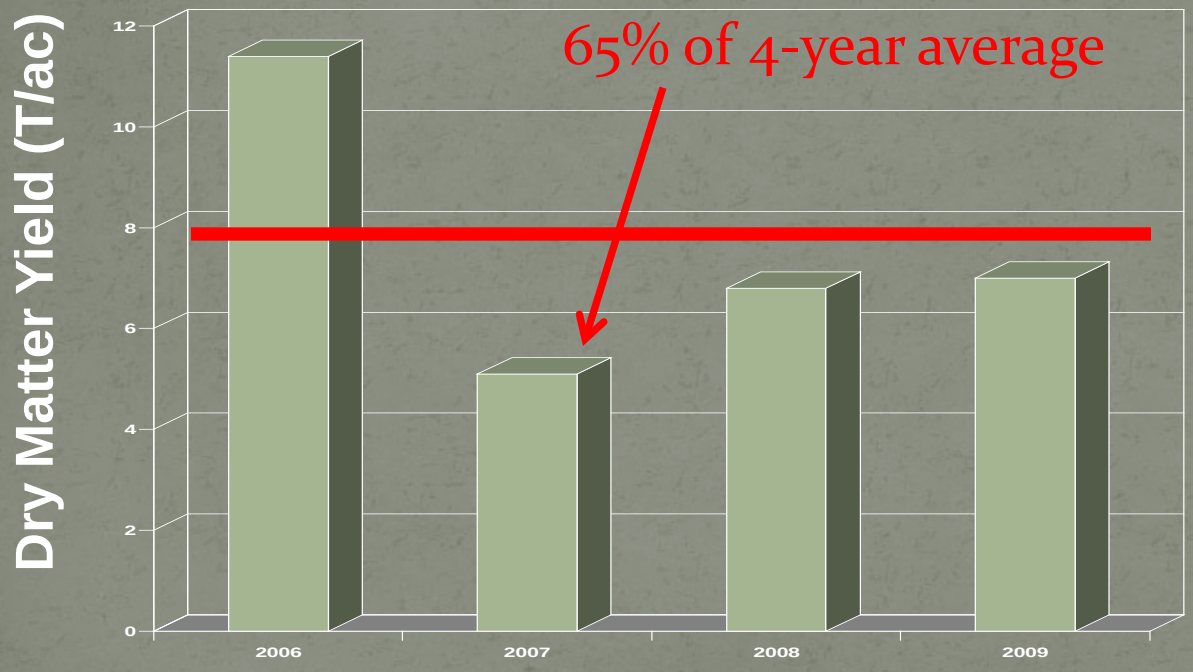

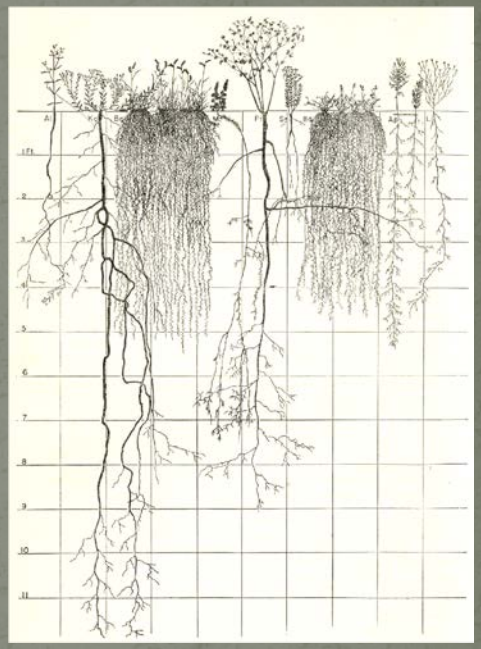

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Average Daily Gain (lb)

Weaned, market steers (600 lb starting weight)

Forage	Grazing	2010	2011	2012	Avg.
Switchgrass	**Early season**	2.29	1.50	2.02	1.94
	Full season	1.98	1.54	1.72	1.75
Big blue/Indian	**Early season**	2.79	1.98	2.44	2.40
	Full season	2.43	1.75	2.18	2.12
E. gamagrass	**Early season**	1.70	1.72	2.17	1.86
	Full season	1.12	0.65	1.42	1.06

Early season (30 days); Full season (71 – 115 days)

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Animal Unit Days per Acre

Weaned, market steers (600 lb starting weight)

Forage	Grazing	2010	2011	2012	Avg.
Switchgrass	Early season	61	73	79	71
	Full season	140	195	178	171
Big blue/Indian	Early season	51	55	56	54
	Full season	106	124	131	120
E. gamagrass	Early season	72	91	92	85
	Full season	160	206	146	171

Early season (30 days); Full season (71 – 115 days)

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Beef Production per Acre (lb)

Weaned, market steers (600 lb starting weight)

Forage	Grazing	2010	2011	2012	Avg.
Switchgrass	Early season	202	160	233	198
	Full season	402	450	454	435
Big blue/Indian	Early season	207	158	200	188
	Full season	375	315	421	370
E. gamagrass	Early season	162	220	295	226
	Full season	249	188	306	248

Early season (30 days); Full season (71 – 115 days)

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Bred Heifer Performance

Forage	ADG	Total gain/ac
BB/IG	1.78	203
SG	1.45	180
EG	1.32	287

Middle Tennessee REC, 2010 -2011; 1,050# Holstein heifers

East Tennessee REC, 2012; 967# Angus heifers

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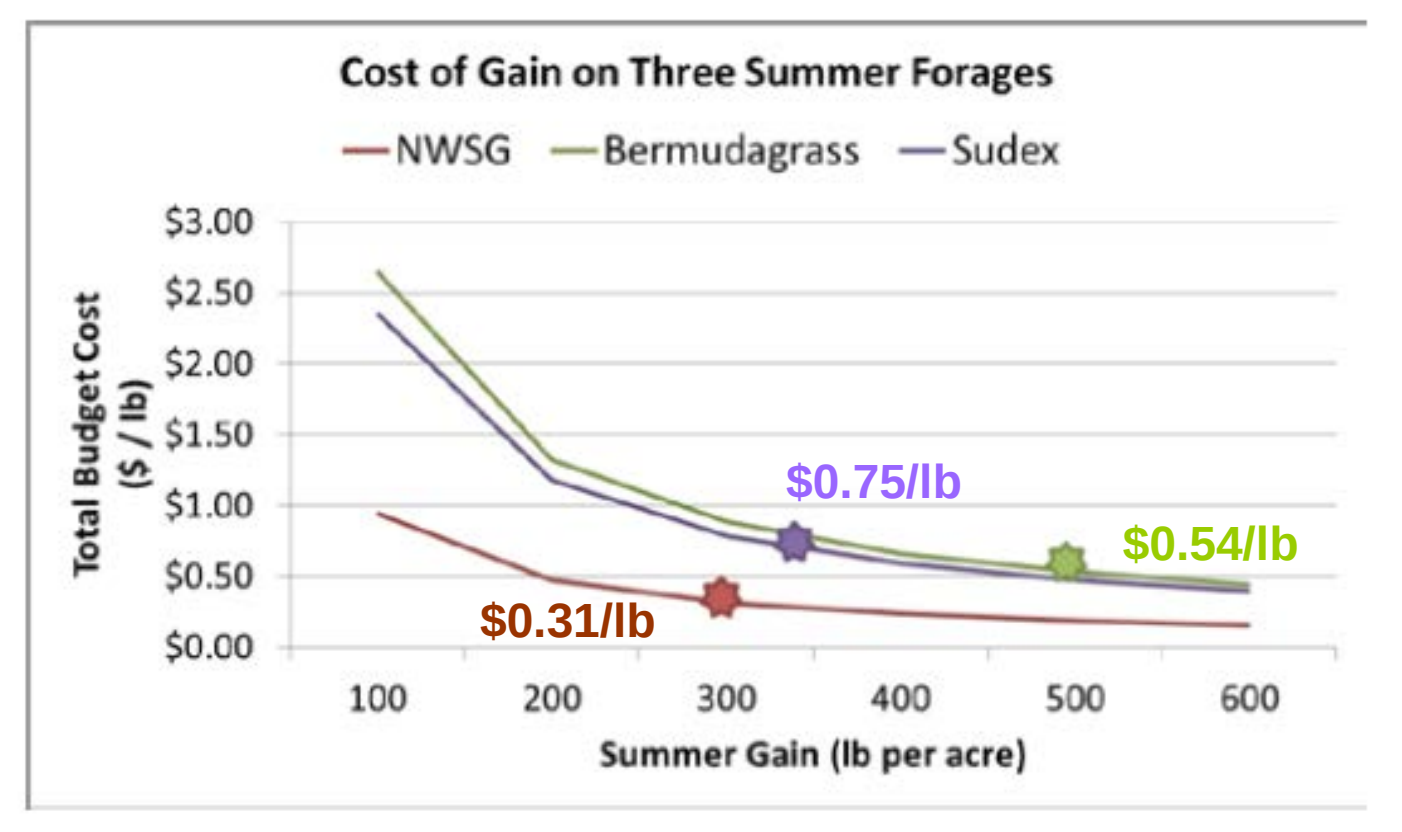
Cost of Gain for Summer Grazing



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Cost of Gain for Summer Grazing

- Cost on a per head (800# steer) basis:
  - @ $0.31/lb, 800 x 0.31 = $248
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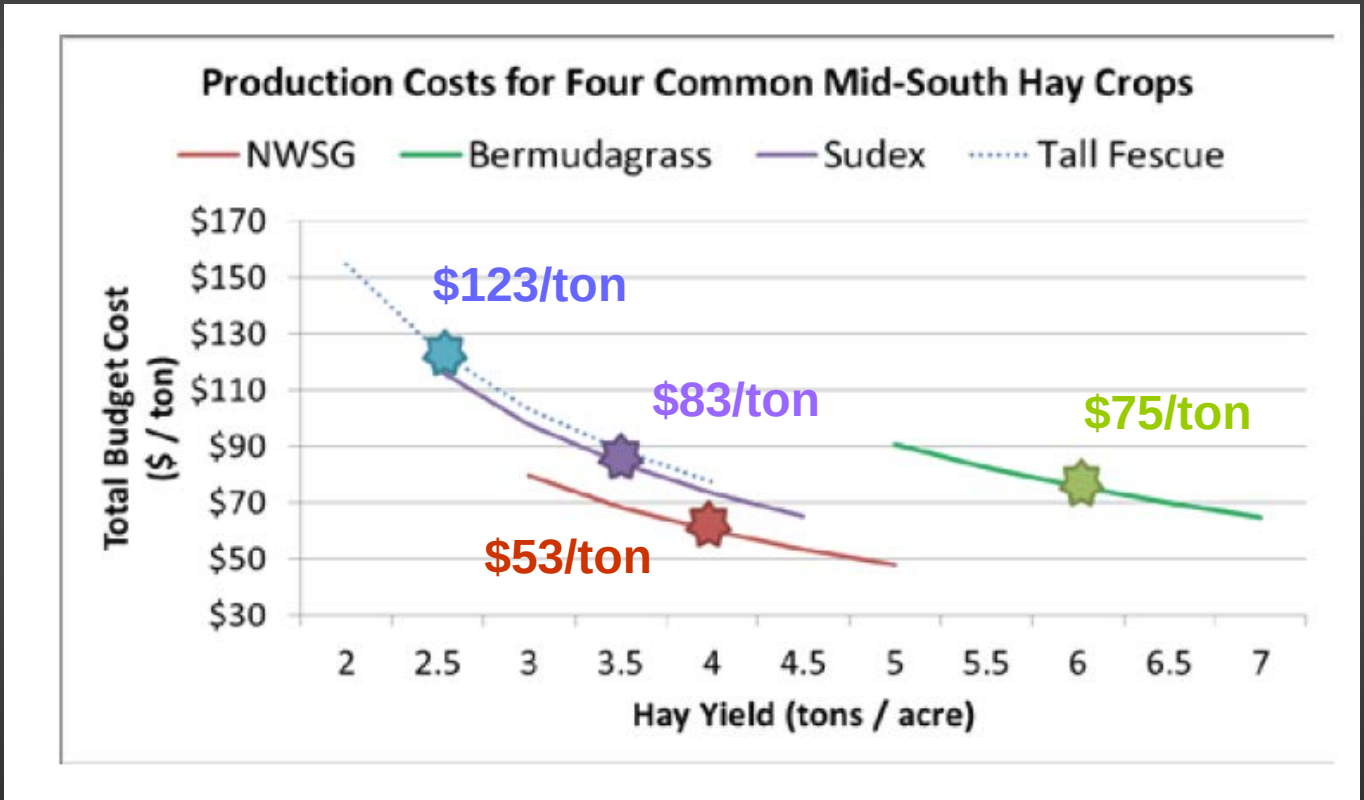
  - With the same number of steers can produce ($1040-248)/($1040-432) x 100 = 30.3% more profit
  - Or can produce the same profit off of ($1040 – $432)/($1040 – $248) x 100 = 76.8% as many steers

Cost of Hay Production



http://nativeforages.utk.edu/

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BB/IG: 1,200 – 1,800 lb/ac
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1 – 1.5 cow-calf pairs

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Proper Grazing Management

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Canopy Management

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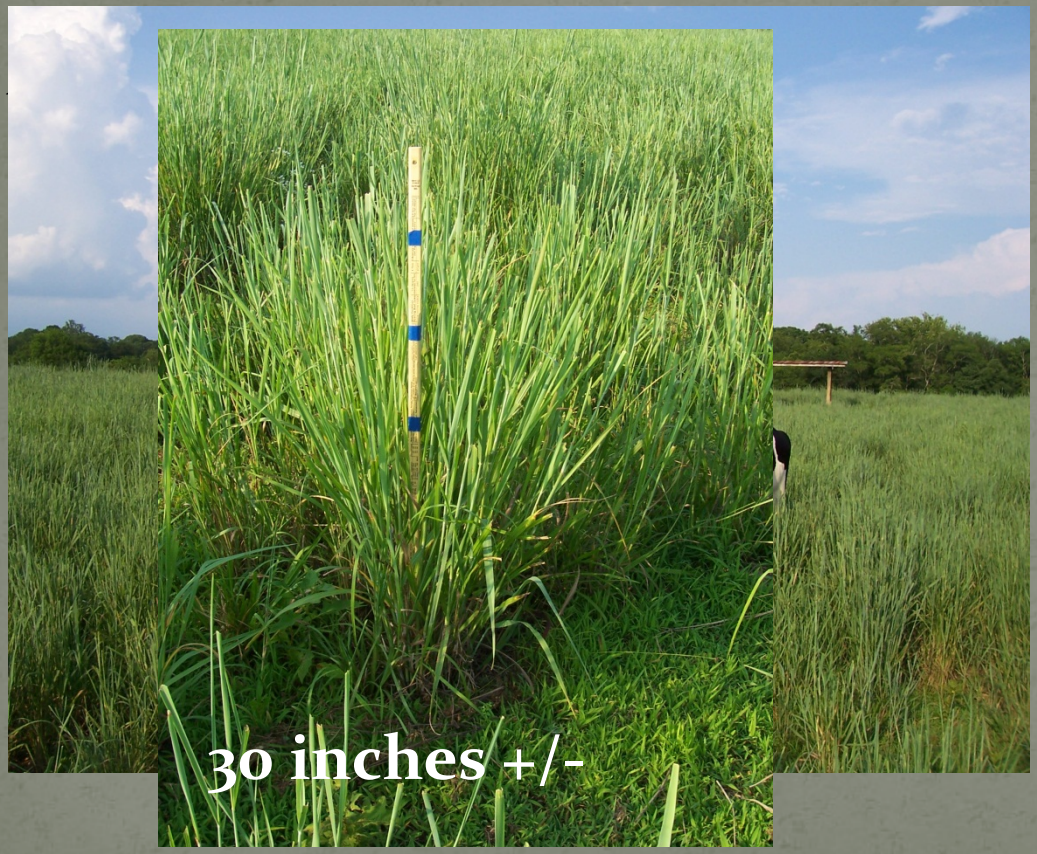
Canopy Management



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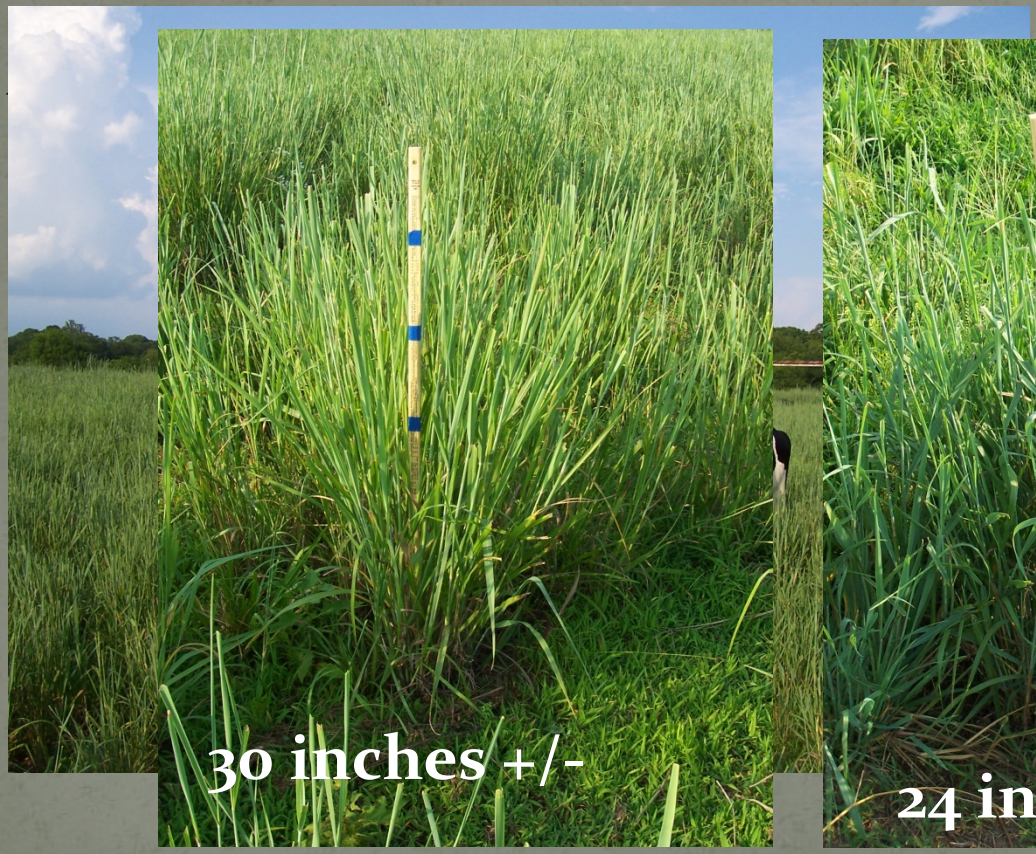

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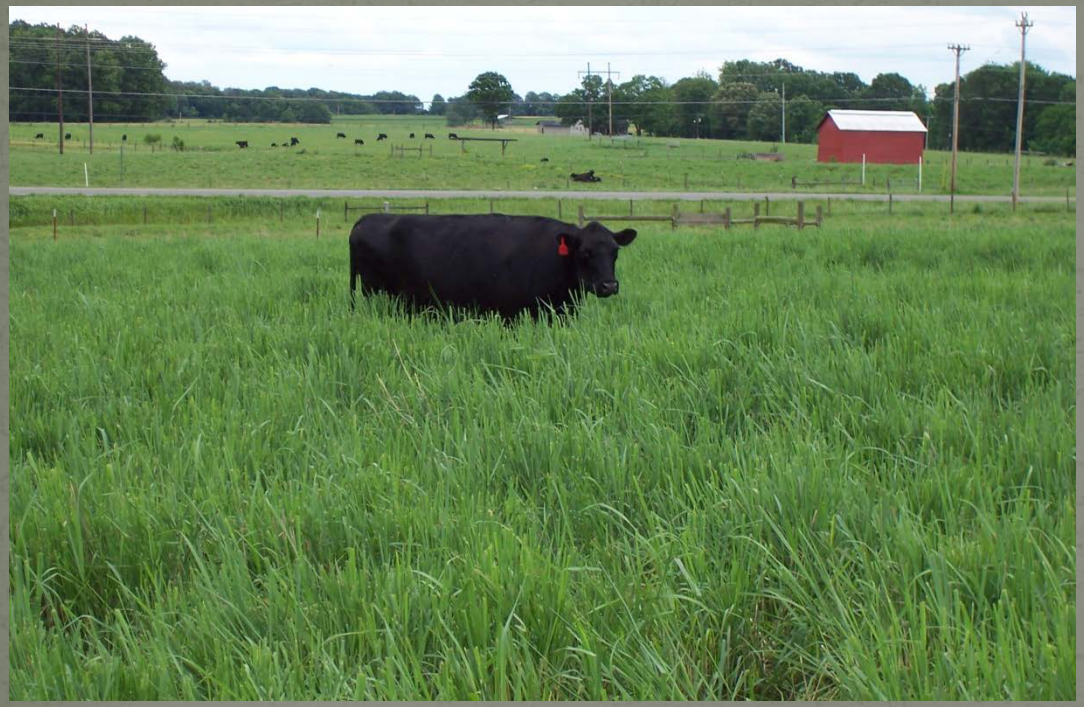
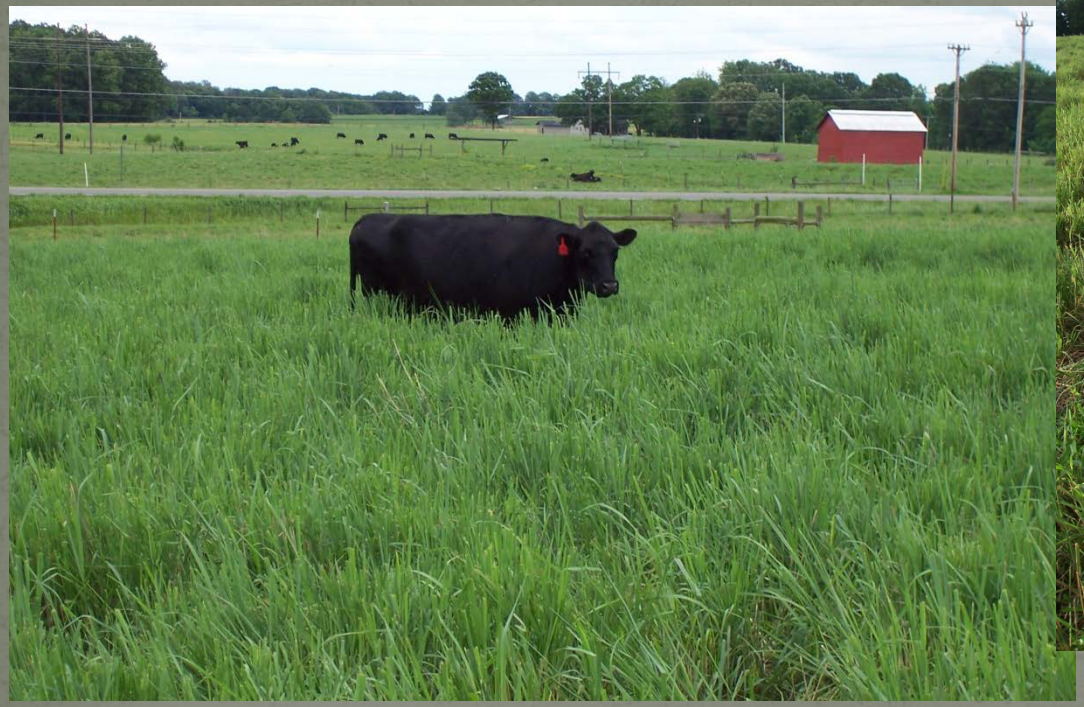


2.8 lb/day

Canopy Management



2.8 lb/day

1.98 lb/day

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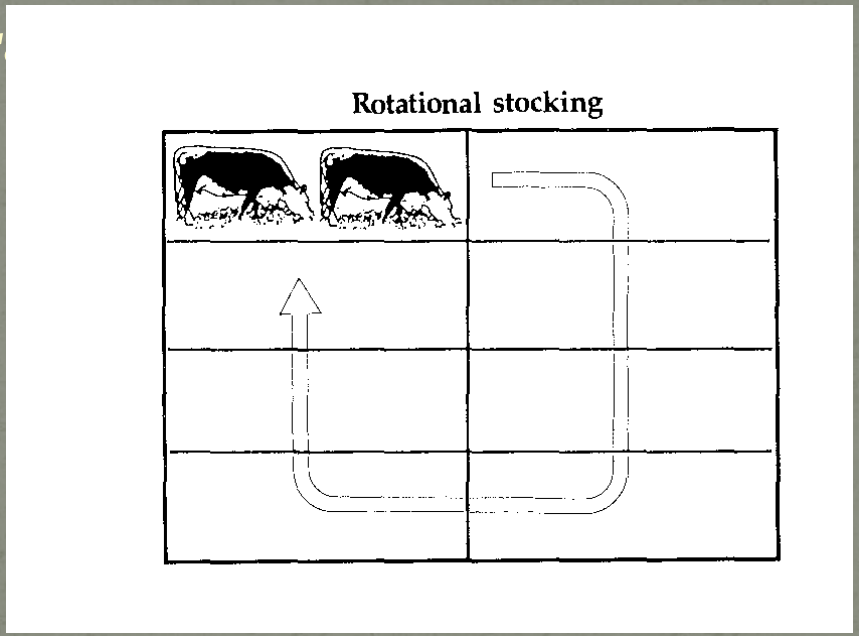

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  - **with continuous, rest after Sept 1 annually**

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  -
  -
  -
  -

June 23; 17 days post-grazing

Early Season Only

June 23, following 30-day early grazing

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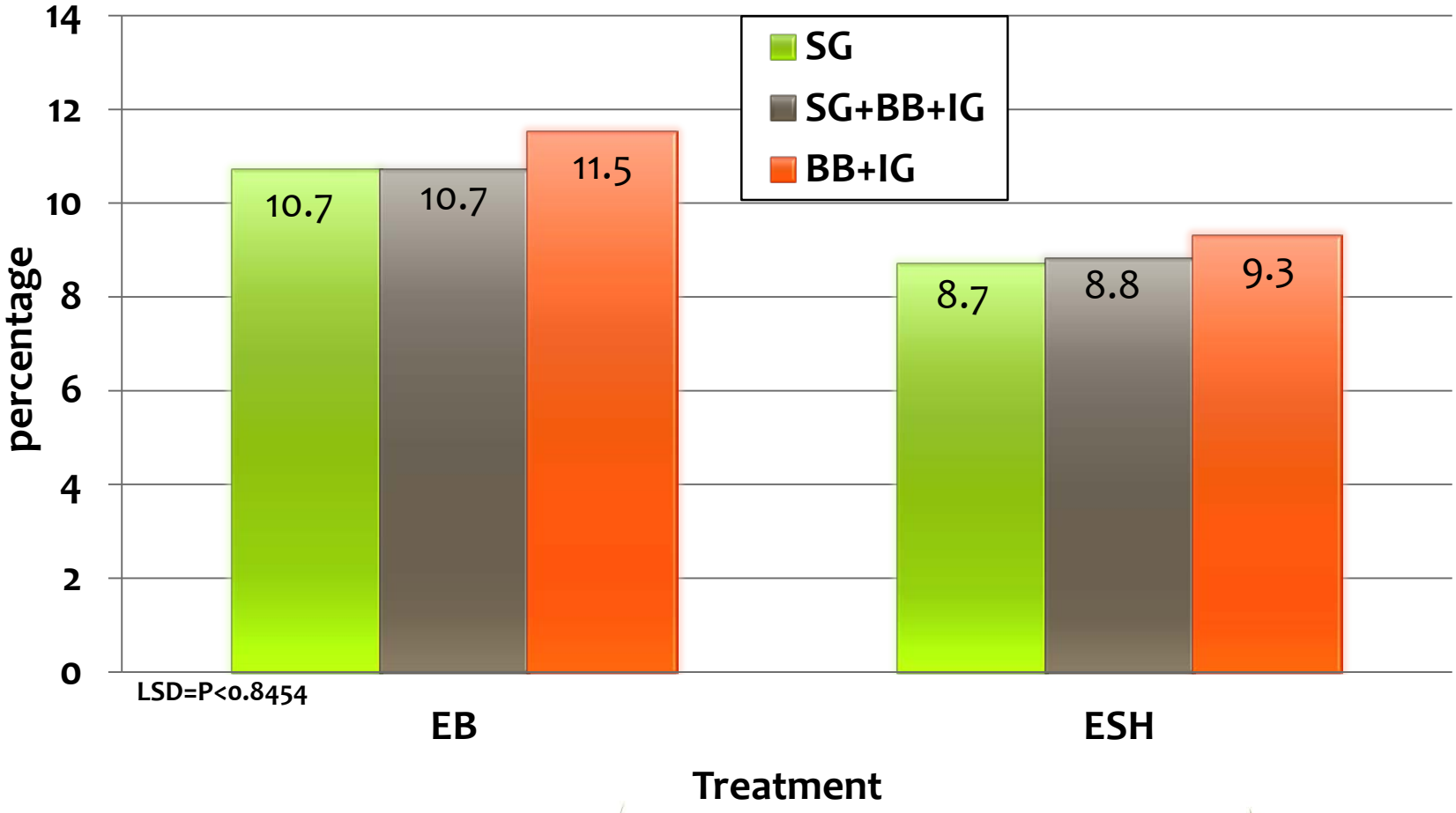
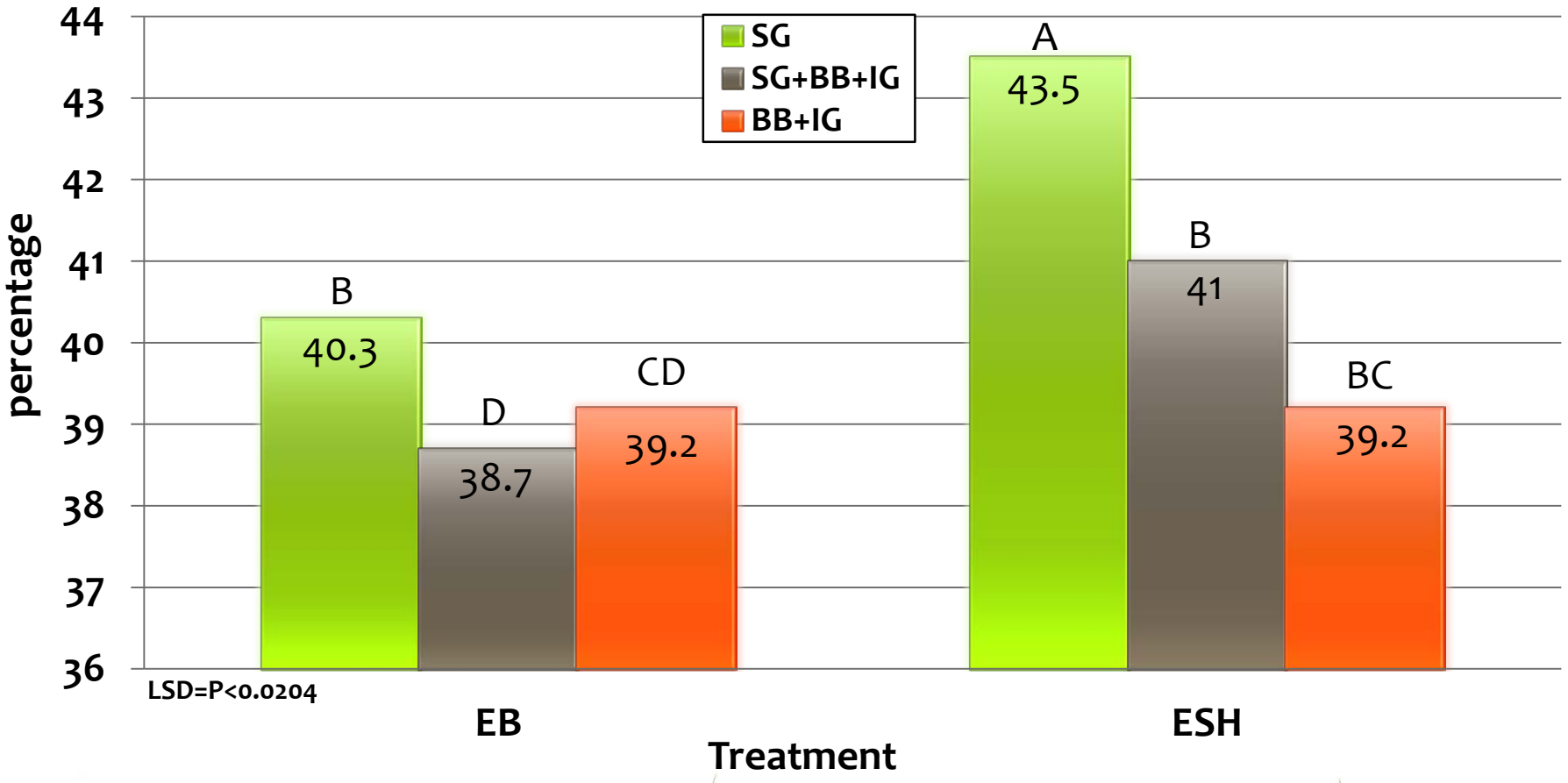
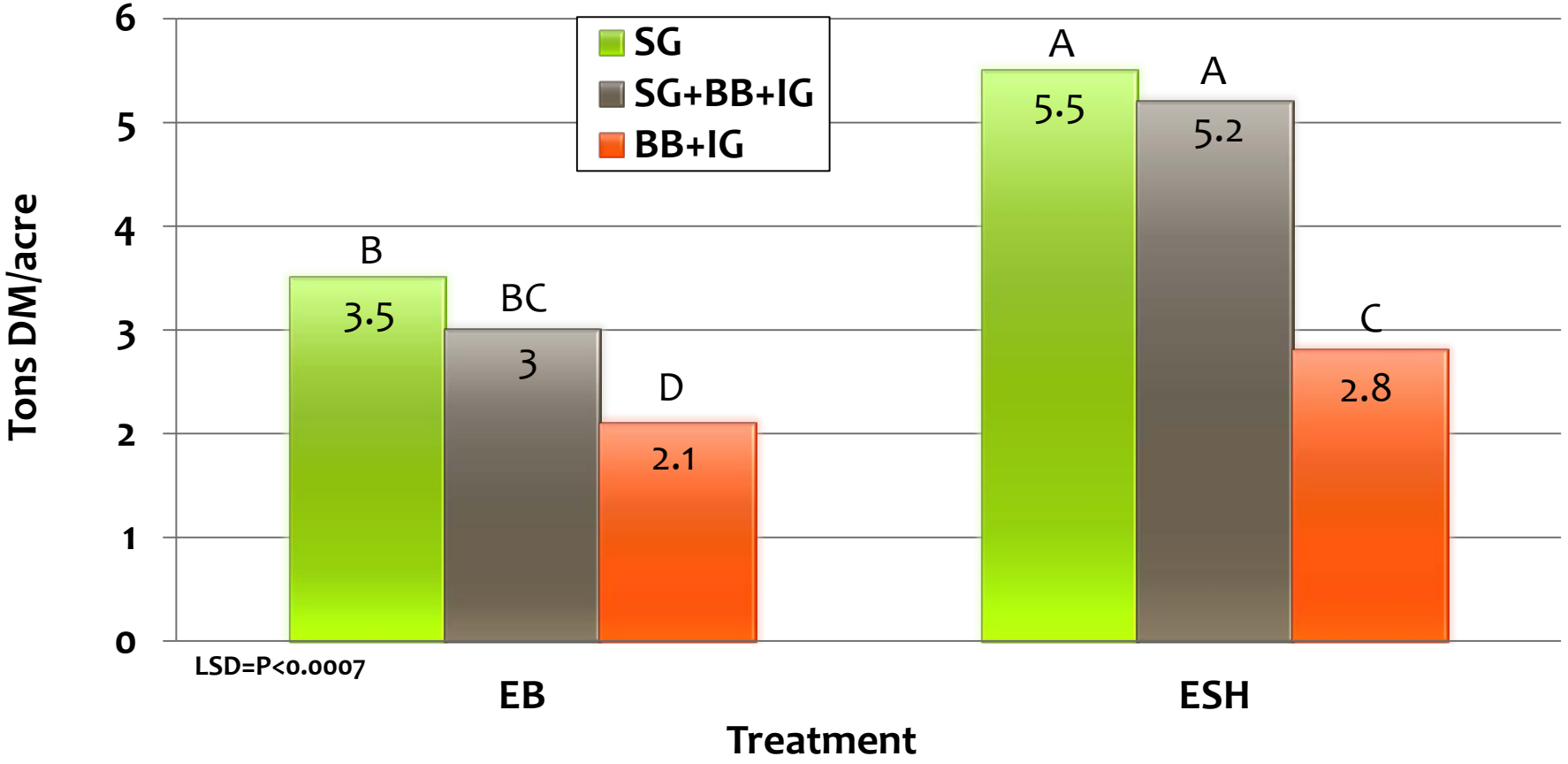
Crude Protein Analysis



Acid Detergent Fiber



Early Harvest Forage Yield



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- Harvest early – by June 1, if possible
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  - Better quality
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- Cut as high as possible (8”) – use ‘boot’ on mower
  - Less stress on stand
  - Faster regrowth
  - Greater subsequent yields

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  - Or ~1.5 from early and 3.5 ton loss from late haying

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Switchgrass Harvest Research

ETREC – Biomass Harvests	Yield (Tons DM/Acre)
November cut / 60 lb @ green up	8.7A
May & Nov / 30 lb @ green up & 60 lb after harvest	6.88AB
May & Nov / 60 lb @ green up & 60 lb after harvest	6.08BC
June & Nov / 60 lb @ green up & 60 lb after harvest	5.96BC
June & Nov / 30 lb @ green up & 60 lb after harvest	5.67BC
May & Nov / 60 lb @ green up	5.54C
June & Nov / 60 lb @ green up & 30 lb after harvest	5.41BC
May & Nov / 60 lb @ green up & 30 lb after harvest	5.25C
June & Nov / 60 lb @ green up	4.84BC

Interseeding Cool-season Legumes

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Switchgrass Interseeding

CAG Harvest	Switchgrass Yield (tons DM/ac)
None	5.6*
Early (Apr 12)	4.7*
Mid (Apr 29)	4.4*
Late (May 16)	4.2*
P >F = 0.63	

Wildlife Habitat

- Structure

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- Structure
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  - Remain productive during severe droughts

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Summary

- With millions of acres of switchgrass (potentially)
- Abundant, high quality, drought-tolerant, summer forage
- Displaced forage production
- Integration gives producers the opportunity to:
  - Exploit alternative markets (hay, beef, biomass)
  - Continue to produce switchgrass during extended market downturns for biomass
  - Remain productive during severe droughts
  - Maintain profitability

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  - Does not appear to require additional fertilizer

Resources

- Technical bulletin series:
  - NWSG for forage production (SP731-A)
  - Establishing NWSG for livestock forage (SP731-B)
  - Grazing NWSG (SP731-C)
  - Producing hay from NWSG (SP731-D)
  - Economic implications of growing NWSG for forage (SP731-E)
  - Competition control in NWSG (SP731-F)
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Questions?

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