## A Place for Native Warm-season Grasses



#### Tenth Eastern Native Grass Symposium Evansville, IN August 30, 2016



P. Keyser Center for Native Grasslands Management



# Poor Summer Forage =

Reduced pasture quality/prodn Increased weed pressure  $\geq$ Toxins (prussic acid, nitrates)?  $\geq$ **Reduced hay production**  $\geq$ Increased feed costs Reseeding/renovating pastures  $\geq$ **Reduced** weaning weights  $\geq$ **Reduced calf crops**  $\geq$ Selling into saturated markets Rebuilding herds (expensive stock)



Jessamine Co, KY Aug 2008





# Standard Performance Analysis

475 herds, TX/NM/OK, 1991 - 2005

Performance by	Тор	2 <sup>nd</sup>	3rd	Low
Profit Quartile	25%	25%	25%	25%
Wean %	84.2	82.7	79.9	80.1
Wean Wt.	547	528	524	502
Acres per Cow	24.4	23.1	20.4	18.3
Feed Cost	\$141	\$158	\$171	\$203
Cost per c.w.t.	\$61	\$80	\$96	\$149
% ROA	6.6%	2.3%	-2.0%	-7.4%

Courtesy, Dr. Jason Johnson, Texas A&M Extension Ag Econ





## **Poor Summer Forage Production**



Jan 2014 - lowest inventory since 1951!!!





# Complementing Cool-season System with Warm-season Grasses =

#### Improved:

drought resiliency
 calving rates/birth weights
 backgrounding/stocker gains
 heifer development
 purchased feed budgets
 opportunities for stockpiling
 condition of CSG pastures (rest)
 soil health
 enterprise profitability/viability



Jessamine Co, KY Aug 2008





## **Exceptional Drought Tolerance**

65% of 4-year average

2008

2009

Data courtesy Dr. Don Tyler, UTIA; collected at Milan REC

2007

2006



l/ac

**Yield** 

**Dry Mattel** 

10



### Exceptional Drought Tolerance Preliminary Data



## Deep Roots = Healthy Soil = Green Grass







# Low Input

No N for 5 years!

# N = 60 lb/ac P & K only test is if "Low" pH > 5.0





# Low Input – vs. Bermudagrass







# Low Input – vs. Tall Fescue

http://www.uky.edu/Ag/Forage/ForageVarietyTrials2. htm).

	Annual Yield (tons/ ac)		Fertility	Harvests
Species	Range	Average	(lb N/ac)	(no./year)
Big bluestem	2.6 - 6.0	3.9	60	1 - 2
Indiangrass	2.5 - 5.9	4.6	60	1 - 2
Eastern gamagrass	3.1 - 9.6	4.9	60	1 - 2
Switchgrass (Alarno)	2.0 - 11.6	5.0	60	1 2
Tall fescue (KY31)	2.1 - 418	3.1	180	4





# **Cost of Hay Production**







# So, NWSG:

- Provide excellent drought tolerance
- Require low inputs
- Enhance soil health (huge root systems = C!)
- Produce inexpensive forage

• But... what about animal performance, do cattle do well on them?

## Animal Performance (Steers)

Forage	ADG	AUD	Gain/ac
Switchgrass	1.74	172	435
Big blue/Indian	2.11	121	369

71 – 115 days grazing per year weaned, market steers (600 lb starting weight)





## Gains Sustained 90+ Days

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Forage	May	June	July	Aug
Switchgrass	2.83	1.92	1.48	0.75
Big blue/Indian	2.83	2.57	1.76	0.87

-excellent tool for backgrounding/stockering steers, and grass-finished operations





# **Economics of Grazing Beef Steers**

Expected beef yield (lb/acre) and net returns (\$/acre)			
	by grass species and	location	
NWSG†	Beef Yield	Net Returns	
<u>West TN</u>			
SG	229 <sup>a</sup>	<b>\$104</b> <sup>a</sup>	
BBIG	266 <sup>a</sup>	<b>\$136</b> <sup>a</sup>	
EG	248 <sup>a</sup>	<b>\$99</b> <sup>a</sup>	
<u>Middle TN</u>			
SG	436 <sup>c</sup>	<b>\$345</b> °	
BBIG	370 <sup>b</sup>	\$257 <sup>b</sup>	

<sup>†</sup> BBIG=Big Bluestem and Indiangrass; SG=Switchgrass; EG=Eastern Gamagrass <sup>a,b</sup> If letter is the same across treatment and location, then means are not different (p = 0.05).

Lowe et al. 2015. Agronomy Journal 107:1733-1740





# **Bred Heifer Performance**

		Total
Forage	ADG	gain/ac
BB/IG	1.78	203
SG	1.45	180
EG	1.15*	205



Middle Tennessee REC, 2010-2011; 1,050# Holstein heifers East Tennessee REC, 2010-2012; 967# Angus heifers



\* Equivalent to 1.35 lb/day, steer basis



# Cost of Gain (\$ per lb) for Grazing Heifers

Heifer development =

- most expensive aspect of beef (or dairy) production
- mostly feed cost (75%) for 30+ months w/o any return!





Keyser et al. 2016. Agronomy Journal 108:373-383



## Eastern Gamagrass vs. Sudex



No N applied on pastures for 5 years!

End and	ADG	Days	Beef/ac
Gama	1.15	192	205
Sudex	1.63	81	129

#### **Perennials**:

-always available
-no decision on whether to plant annual
-or when to plant it
-no annual estab risk
-no prussic acid/nitrates
-more grazing days





# So, NWSG:

- Provide excellent drought tolerance
- Require low inputs
- Contribute to soil health
- Produce inexpensive forage
- Produce good animal performance (steers and heifers)Provide advantages over annuals

But... aren't they difficult to manage?

# Grazing Management: Intensity

**Management Intensive Grazing** (1 – 6 hours)

**Rotational Grazing (intensive: 1 – 3 days)** 

**Rotational Grazing (simple: 1 – 3 weeks)** 

**Heavy Early Stocking** 

**Continuous Grazing** 



More

ess



# Heavy Early vs. Continuous Stocking





# Heavy Early vs. Continuous Stocking



Janagemen

# Heavy Early vs. Continuous Stocking



Managemen



## Preliminary Animal Performance – Beef

Grazing Strategy	ADG (lb/day)	Steer Days/ac	Beef/ac (lb)
Continuous	2.05	138	283
Heavy Early	2.07	135	275

\* O N/ac applied since at least 2011

- 220-250 lb/head over summer season (112 days)







# Flexibility: Timing Forage Availability...







# Resiliency

#### No N applied for 6+ years





# So, NWSG:

- Provide excellent drought tolerance
- Require low inputs
- Contribute to soil health
- Produce inexpensive forage
- Produce good animal performance (steers and heifers)
- Provide advantages over annuals
- Aren't difficult to manage

• But... are extremely difficult to establish, right?

# **Establishment**

Planted April 20, 2012, 10 PLS lb/ac BB (6)/IG(3)/LB(1) picture taken Sept 28, 2012





# **Grassland Birds: Severe Declines!!**



# Improved Cover...

#### Winter

#### Summer



NWSG

#### Fescue





# Natural Disturbance in Grasslands

- essential to healthy grasslands
- especially where rainfall is >35"
- fire is important, but grazing may be critical







# Rolling Red Plains & Bobwhites







#### **2014 Stony Point Quail Locations**

#### " Ungrazed previous 2 years





Courtesy K. Hedges, Mo Dept. Conservation



Grazed previous year.

#### Burned 1.5 years earlier

#### Legend

grazed 2015spburns 2014fallburns

Courtesy K. Hedges, Mo Dept. Conservation

# Grazed Quail Cover







## Footprint of 377 MM dt of Grass Production



**Dry Tons** 

zero

up to 500 thousand up to 1 million up to 2 million up to 4 million over 4 million

English et al. 2006 (http://www.agpolicy.org/ppap/)



# **Grassland Birds**

Hayed, grazed, seed production, biofuels, and controls KY & TN \* no difference in occupancy for EAME, GRSP, NOBO, or RWBL

Grassland Bird Use of NWSG Production Fields, 2009 - 2010



**NWSG Production Category** 



West et al. 2016 JWM in press



# Summary and Conclusions

Native grasses, which are drought-tolerant, low input perennials that enhance soil health and provide:
high stocking (1,000 – 2,500 lb/ac)
strong gains (>2.0 lb/day)
very good total production (350 – 450 lb/ac)







# Summary and Conclusions

- Native grasses can make important contributions to profitable grazing through:
  - stockering
  - backgrounding calves
  - heifer development
  - providing "drought insurance" for cow-calf operations improved calving rates/weights (toxicosis issues)???







# Summary and Conclusions

 Native grasses can be managed with a good deal of flexibility and are resilient to mis-management with some care

 Natives can provide excellent habitat for at-risk wildlife – ESPECIALLY – with proper grazing









# Questions?



