Effects of fescue cultivar on performance of beef cows grazed on summer stockpiled tall fescue pastures

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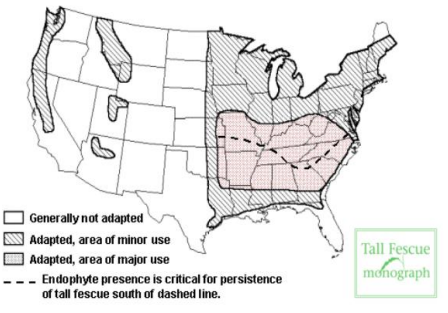
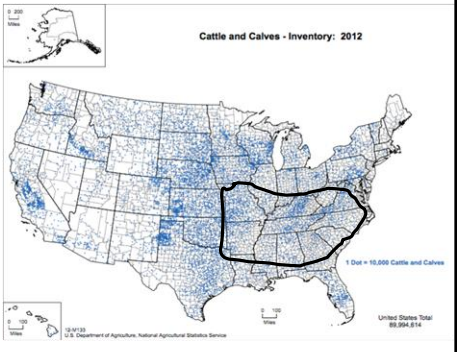
Tall Fescue in the United States





http://forages.oregonstate.edu/tallfescuemonograph

Fribourg et al., 2009; Smith et al., 2009; Adapted from USDA Ag Census, 2012

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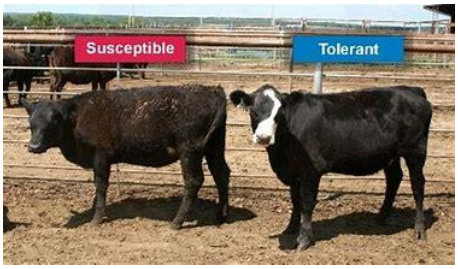
Challenges with KY-31



- Endophyte infected tall fescue = KY-31
  - Significant economic and performance losses associated with fescue toxicity

+ Drought Resistance	– ADG	– Conception Rate
+ Pest Tolerance	– Milk Production	– Hair Retention

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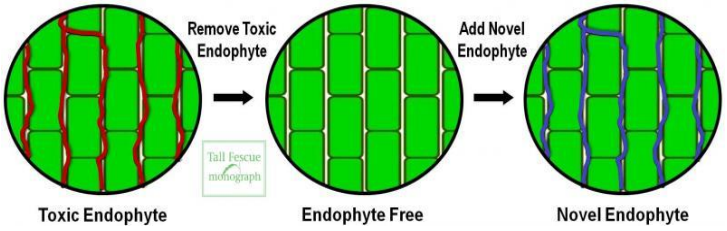
Improved Fescue Cultivar



http://forages.oregonstate.edu/tallfescuemonograph

- Jesup MaxQ is a novel endophyte-infected cultivar
  - Maintains drought tolerance and pest resistance of KY-31
  - Improved animal performance

Parish et al., 2003 Gunter and Beck, 2004

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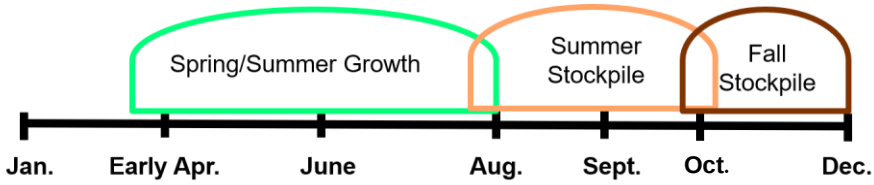
Summer Stockpiled Fescue

- Management strategy developed at Shenandoah Valley Agricultural Research and Extension Center
  - Allows for proper accumulation of fall stockpiled pastures
  - Extends grazing season for 60-90 days
- Summer Stockpiling (SS)
  - Early Spring – defer portion of grazing for SS pastures
    - Apply nitrogen in May
  - Late Summer – strip graze SS pastures



Booher et al., 2017

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Objectives and Hypothesis

Objectives

- To evaluate the following outcomes when cows are grazed on KY-31 or MaxQ SS pastures:
  - Forage Availability
  - Nutritive Value and Total Ergot Alkaloid Concentration
  - Cow Performance
  - Calf Performance

Hypothesis:

- Forage availability and nutritive value will not differ by fescue cultivar
- Grazing MaxQ SS pastures will lead to improved animal performance

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Experimental Design

- Shenandoah Valley Agricultural Research and Extension Center
  - Raphine, VA
- Completely Randomized Design
- 64 pregnant, fall-calving cows
  - ¾ Angus x ¼ Simmental
- 52 d grazing period
  - August 31, 2017 to October 24, 2017
  - August 31, 2018 to October 24, 2018
  - 24 ± 12 d prepartum to 28 ± 12 d postpartum

Photo Credits: http://www.arec.vaes.vt.edu/arec/shenandoah-valley.html & Grace Barry

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Treatments

- Cows stratified by BW, BCS, and expected calving date
- Cows allotted to 10 pastures:
  - Eight 2 ac. pastures with 4 cows
  - Two 8 ac. pastures with 16 cows
- Stocking rate of 0.50 ac. /cow
  - Total acreage of 32 ac.
- Pastures strip-grazed without back wire
  - Forage allotted every 3 to 4 d

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Cattle & Forage Measures

Cow:

- BW
  - d 1-2 & 51-52
- BCS
  - d 1-2, 24 h post-calving, and 51-52
- Milk
  - d 51-52
  - Weigh-Suckle-Weigh technique
- AI conception

Calf:

- BW
  - Birth, d 51-52, and weaning

Forage:

- Forage Mass
  - Every 7 d
  - Grazed and ungrazed portion of each pasture
- Total Ergot Alkaloids
  - Every 14 d
- Nutritive Value
  - Every 14 d
  - CP, ADF, NDF, Fat, and Ash

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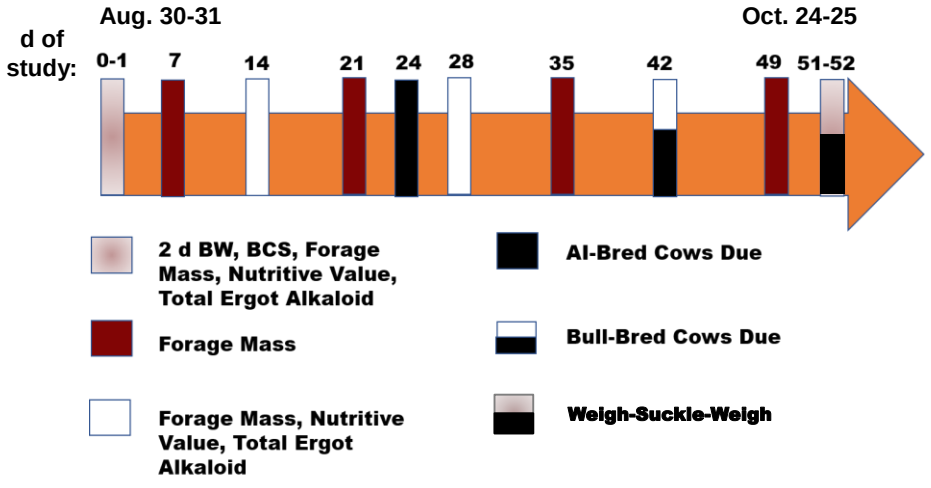
Experimental Timeline



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Statistical Analysis

- Pasture group considered experimental unit
- Data were analyzed using PROC MIXED of SAS 9.4
  - Animal and Forage Measures
    - Fescue strain included as fixed effect
    - Pasture group included as random effect
  - Forage Measures
    - Repeated measures by sample date
- AI conception rate analyzed using PROC GLIMMIX of SAS 9.4
- Significance level at P ≤ 0.05

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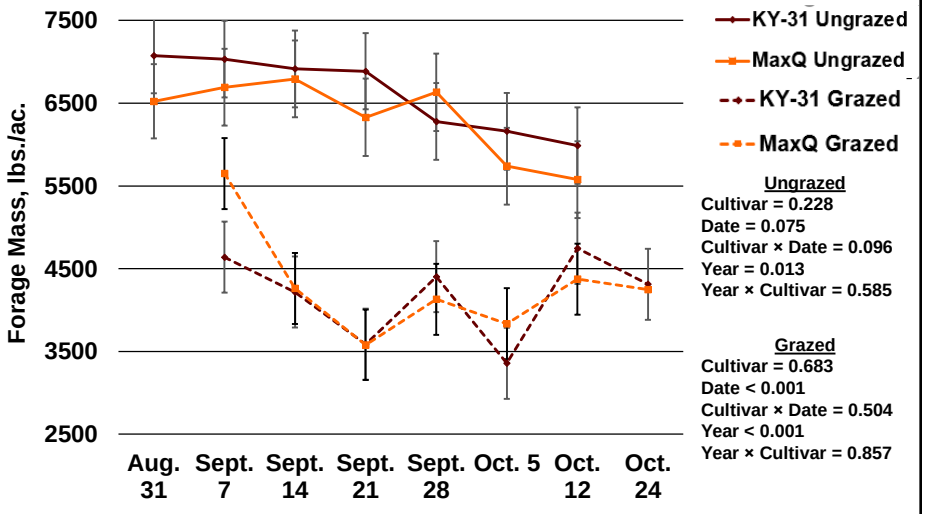
Available Forage Mass



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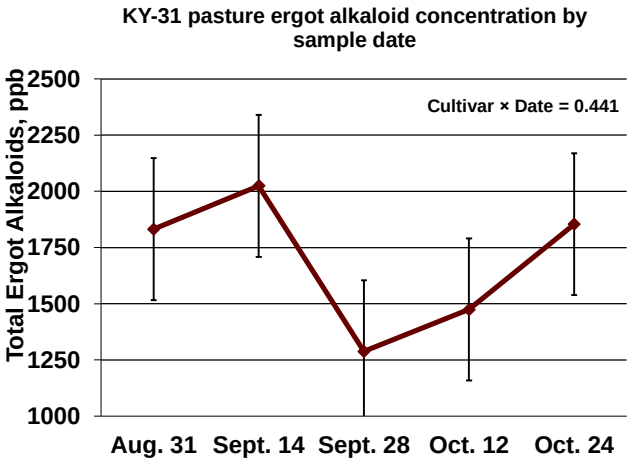
Forage Analysis - Year 1



- Initial MaxQ Total Ergot Alkaloid = 112 ppb

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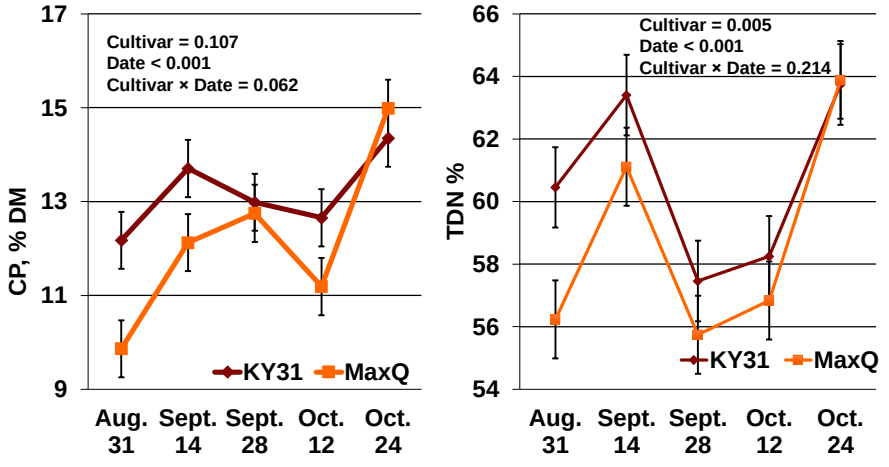
Nutritive Value – Year 1



TDN = 98.625 - (1.048 * ADF)

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Cow Body Weight

			P-Value		
	KY-31	MaxQ	Cultivar	Year	Year*Cultivar
Initial BW, lbs.	1199	1199	0.81	<0.01	0.80
End of Grazing BW, lbs.	1087	1116	0.80	0.54	0.82
Pre-Breeding BW, lbs.	1120	1118	0.83	<0.01	0.79
BW Change Initial to end of grazing, lbs.	-112	-83	0.34	<0.01	0.74
BW Change initial to pre-breeding, lbs.	-79	-81	0.37	<0.01	0.32

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Cow Body Condition Score

			P-Value		
	KY-31	MaxQ	Cultivar	Year	Year*Cultivar
Initial	5.4	5.3	0.97	0.68	0.86
End of Grazing	4.7	4.7	0.58	0.77	0.64
Pre-Breeding	3.8	3.9	0.86	<0.01	0.75
Change Initial to end of grazing	-0.7	-0.6	0.52	0.17	0.39
Change initial to pre-breeding	-0.7	-0.7	0.88	<0.01	0.98

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Cow & Calf Performance

	KY-31	MaxQ	Cultivar	Year	Year*Cultivar
Birth BW, lbs.	66	68	0.65	0.56	0.51
52 ± 12 d of age BW, lbs.	124	121	0.86	0.12	0.97
Weaning BW, lbs.*	368	351	0.41		
ADG, lbs.					
52 ± 12 d of age	1.70	1.72	0.90	<0.01	0.99
Weaning*	1.63	1.53	0.92		
Milk lbs./d	20	15	<0.01	<0.01	0.03
AI Conception*	77.4	89.7	0.21		

* Year 1 only

- Calves were weaned at 202 ± 14 d of age

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Conclusions & Implications

Conclusions:

- No differences in forage availability
- Nutritive value showed statistical differences among TDN
  - Difference in initial ergot alkaloid concentration expected
- Minimal differences in cow or calf performance

Implications:

- Fescue Cultivar in summer stockpiled tall fescue pastures did not affect on animal performance when cows were pre-exposed to toxic endophyte-infected tall fescue.
- Pastures renovated with MaxQ can be used during other times of year when effects of fescue toxicosis are expected to be more severe

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