Focus on Forages

Beef Webinar

John Fike, SPES
jfike@vtledu

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Keys to Successful Forage Programs

- Basic commodity is forage
  - Are you a forage producer or livestock manager?
- Use reliable information
  - University Extension, NRCS, etc.
- Timely management actions
- Test / fertilize soils to maintain optimal fertility
- Use adapted species and match to needs
- Maximize length of grazing season
- Choose most efficient grazing methods
- Minimize stored feed costs

What are the three primary management practices forage producers should be utilizing?

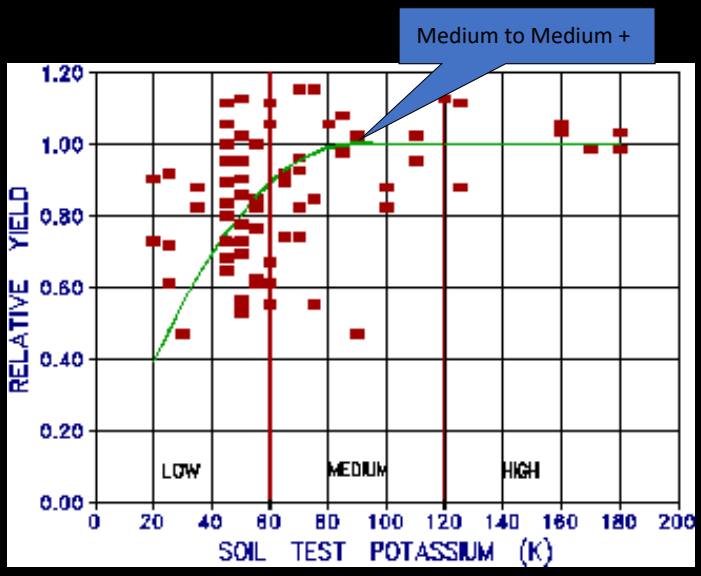
- Soil testing and applying appropriate fertility
- Rotationally stocking/grazing
- Stockpiling tall fescue
  - ❖And managing to mitigate toxicosis

Soil is foundational

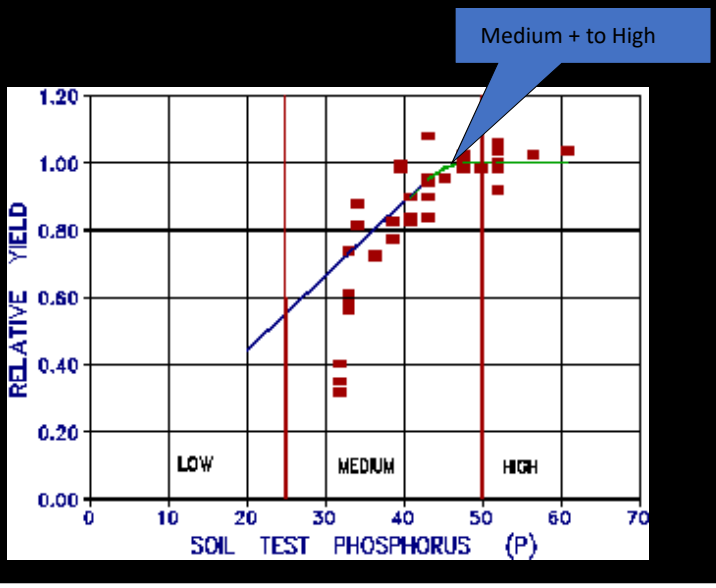
"The performance of my animals
reflects the condition of my pastures
and
the condition of my pastures reflects
the state of my soils."

- Steve Lucas, Louisa, VA

Soil Test K and Forage Yield



Soil Test P and Forage Yield



P (and other?) effects on calf ADG

56-d trial: grazing stockpiled fescue late winter/early spring
standard forage availability among treatments

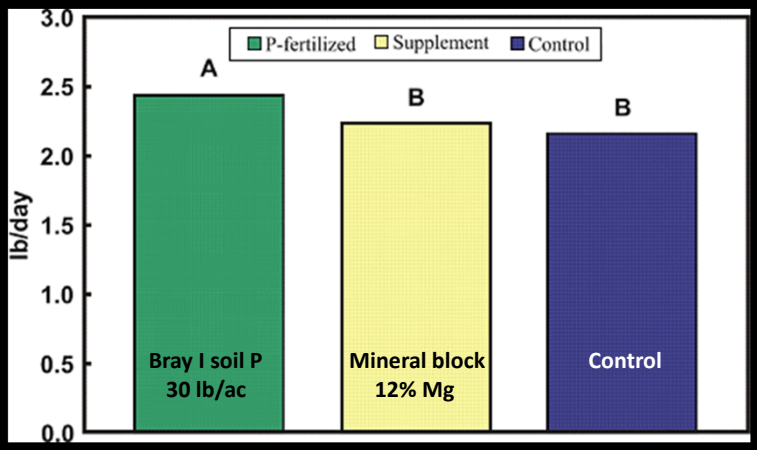


Fig. 3. from Kallenbach et a1., 2004. Different capital letters indicate treatment differences at the 0.10 alpha level.

Performance of Steers Grazing Endophyte-Infected Tall Fescue With and Without Ladino Clover In North Alabama

Pasture Type	ADG, lb	Gain per animal, lb	Gain per acre, lb
Fescue + White clover	1.53	307	582
Fescue + 150 lb N/acre	1.06	203	374

Clover economics

Table 5. Main effects of nitrogen fertilization or clover interseeded into tall fescue pastures on economics of the growing cattle enterprise during the autumn averaged across 4 yr

	Treatment			
Item	N[1]	CL[2]	SE	*P*-value
Value of gain, $/ha	534.24	479.68	82.78	0.02
Cost of gain, $/ha	443.37	320.58	37.32	<0.01
Net return, $/ha	90.87	159.10	81.93	<0.01

[1]N = tall fescue pastures with 67 kg N fertilizer/ha applied in autumn and spring.
[2]CL = tall fescue pastures interseeded with white clover to replace N fertilizer.
[3]Tall fescue type × CL interaction, $P \geq 0.26$.
[4]Tall fescue type × CL interaction, $P = 0.02$.

Beck et al., 2012

Rotationally grazing/stocking

- Controlling timing, frequency, and intensity of defoliation
- Affects productivity, regrowth, persistence, species composition

Figure 2. The orchardgrass plant on the left was clipped weekly to 1 inch for one month to simulate continuous grazing. The orchardgrass plant on the right was clipped at the beginning and end of the month to 3.5 inches to simulate rotational grazing. For the plant on the right, the value of rotational grazing is apparent after six days of regrowth.

Starting and Stopping Grazing

Species	Start	Stop	Rest
	----inches----		days
Alfalfa	10-16	2-4	30-40
Bermudagrass	4-8	1-2	7-15
Tall Fescue	8-10	2-3	15-30
Ky. Bluegrass	4-8	1-3	7-15
Orchardgrass	8-12	3-6	15-30
Switchgrass	18-22	8-12	30-45
Pearl Millet	20-24	8-12	10-20

Residue management differs by species

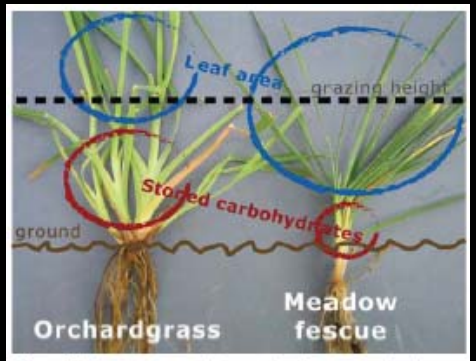
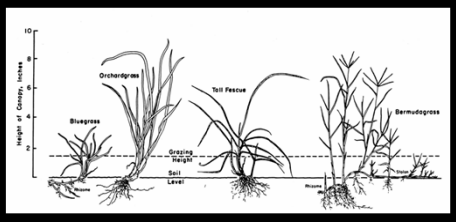
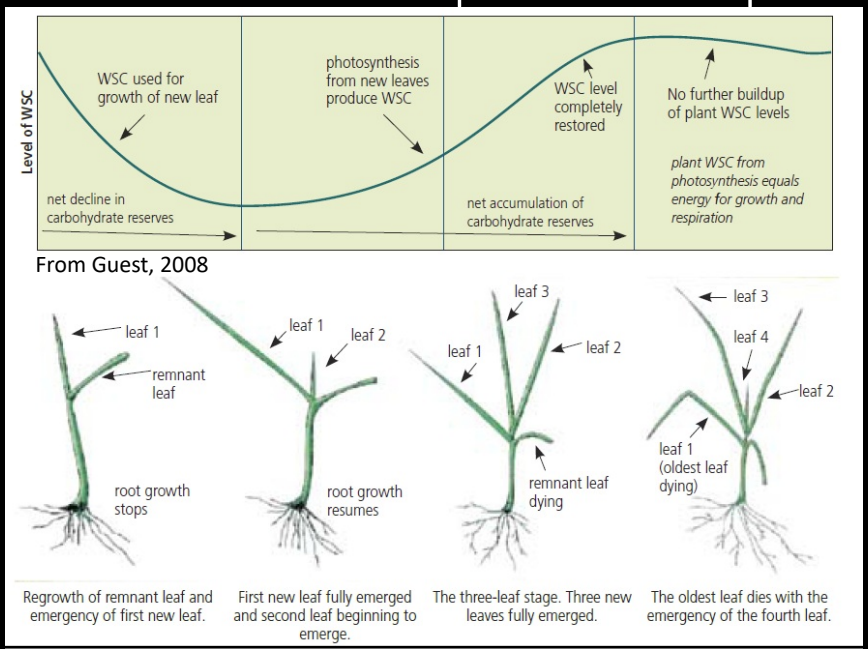


Figure 5. When compared to meadow fescue, orchardgrass exhibits slower regrowth after grazing for two reasons: The stored carbohydrates in the stem base are more likely to be eaten (and not available for regrowth) because the stem base is higher in the canopy; and there is less leaf area remaining after grazing to photosynthesize new carbohydrates.

From Geoff Brink, ARS



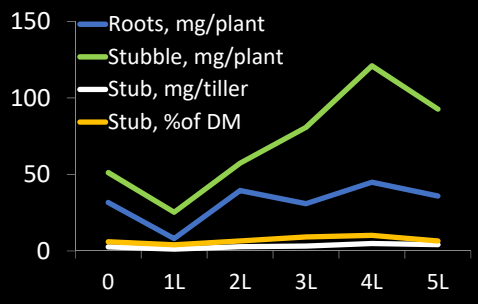
Time defoliation to plant development



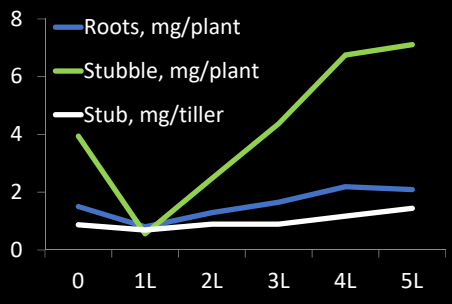
From Guest, 2008

Fescue response to defoliation frequency

WSC response to defoliation stage



Plant DM response to defoliation stage



"0" = start of harvests. Subsequent harvests at 1-, 2-, 3-, 4-, or 5-leaf stage **From Donaghy et al.**

Rest is essential for regrowth – and intake

Animal variables		T1	T2	T3	SE	P
DM intake	kg ha^{-1}	1.07	1.65	2.03	0.18	<0.01
DM intake	kg (100 kg LW)$^{-1}$ h^{-1}	0.28	0.43	0.54	0.05	<0.01
Biting rate	bites min^{-1}	41.3	42.0	42.5	1.28	0.35
DM intake/bite	g bite^{-1}	0.45	0.65	0.85	0.08	<0.01
DM intake/bite	mg (kg LW)$^{-1}$	1.16	1.71	2.15	0.21	<0.01
DM utilization	%	74.9	68.7	56.9	5.80	<0.01

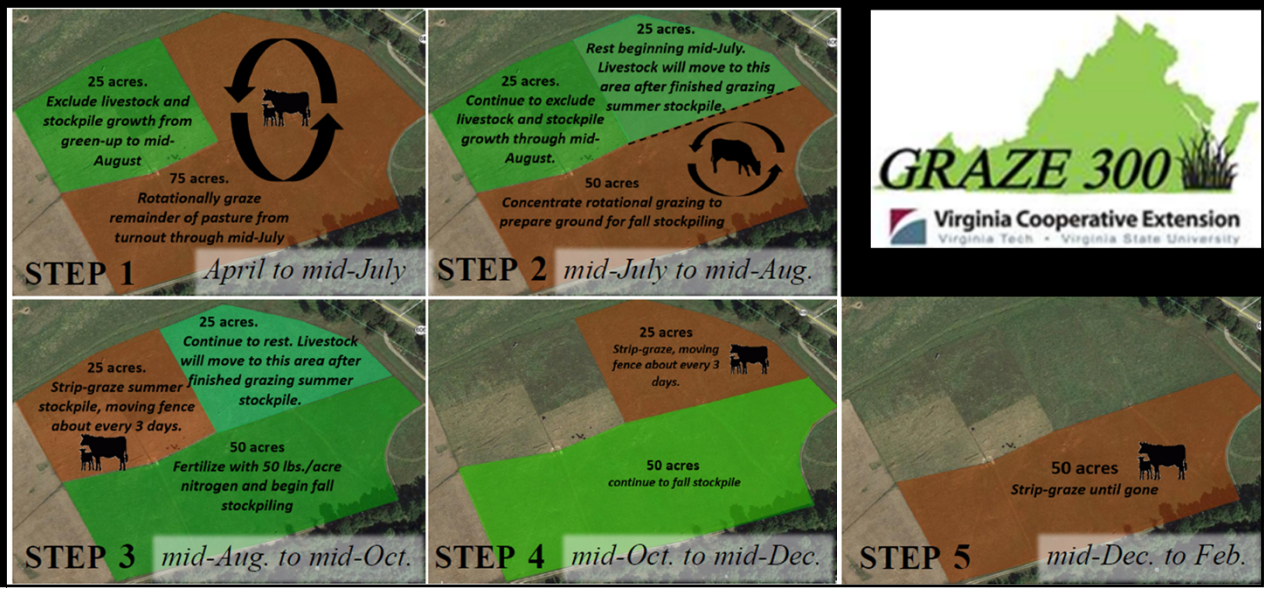
† T1, T2, and T3 represent swards of 14, 21, and 28 d of age regrowth, respectively.

Arias et al., 1990

Figure 15. Left: Overgrazing causes a poor soil cover resulting in water runoff, soil erosion, and poor insulation. Thus, high soil temperatures in summer and low water infiltration cause poor growth or death of plants. Right: Very dense tall sods, undergrazing, or late harvesting often kill the short leafy tillers and depress yield, quality, and later growth.

Prepare now for summer stockpiling

https://www.pubs.ext.vt.edu/CSES/CSES-201/CSES-201.html



https://ext.vt.edu/agriculture/graze-300.html

Defoliation effects on roots

Percent Leaf Volume Removed	Percent Root Growth Stoppage
10%	0%
20%	0%
30%	0%
40%	0%
50%	2-4%
60%	50%
70%	78%
80%	100%
90%	100%

From Crider, 1955

Other benefits of rotational stocking

- Greater water capture
  - Less runoff
  - More water for plant growth
- Lower canopy temperatures
- Increased soil C

Photos – Dale Wolf

Economically optimal nitrogen application

– data from Franzluebbers