2010 Georgia Grazing School:

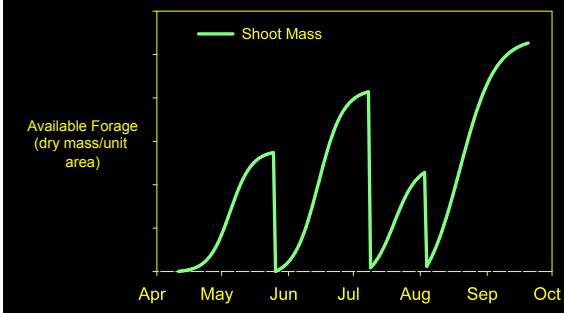
Manipulating forage growth: The essence of rational grazing

2010 Grazing School for Milk Producers

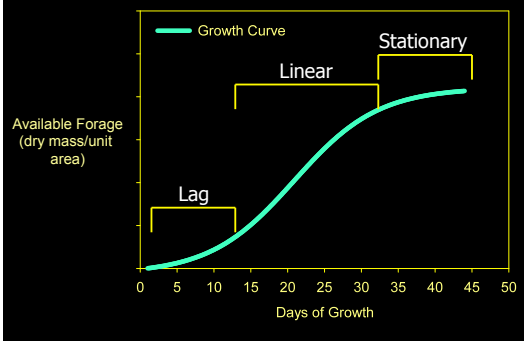
Manipulating forage growth and grazing behavior: The essence of rational grazing

Dennis Hancock
Extension Forage Specialist
UGA – Dept. of Crop and Soil Sciences

Forage Managed for Hay



"How does your forage grow?"



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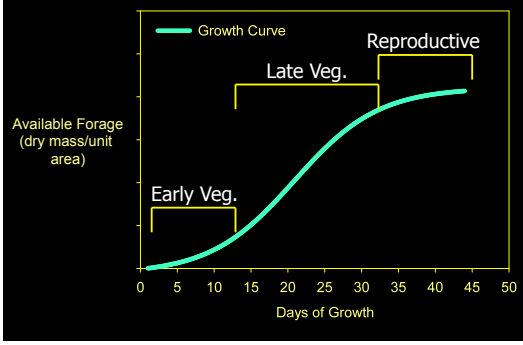
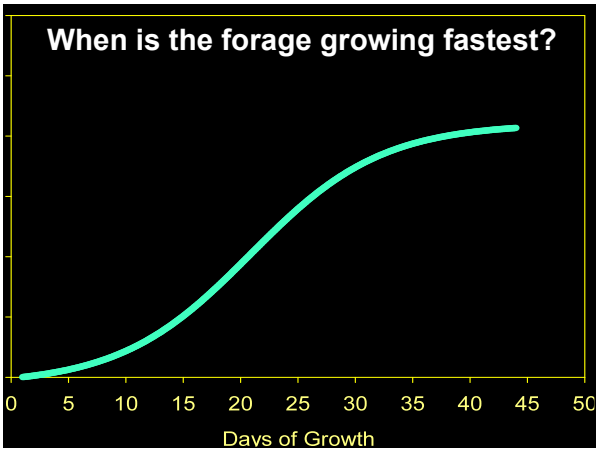


When is the forage growing fastest?



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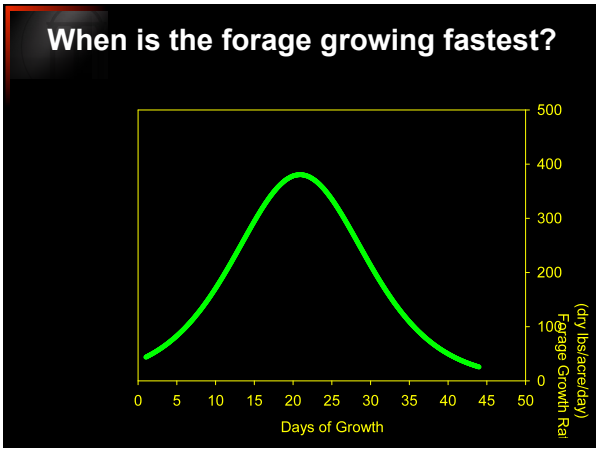

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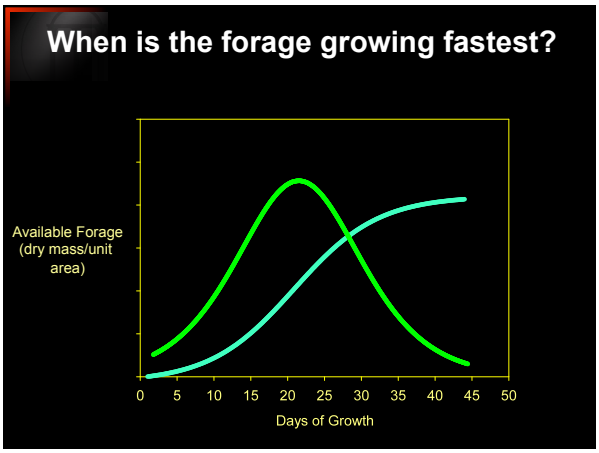

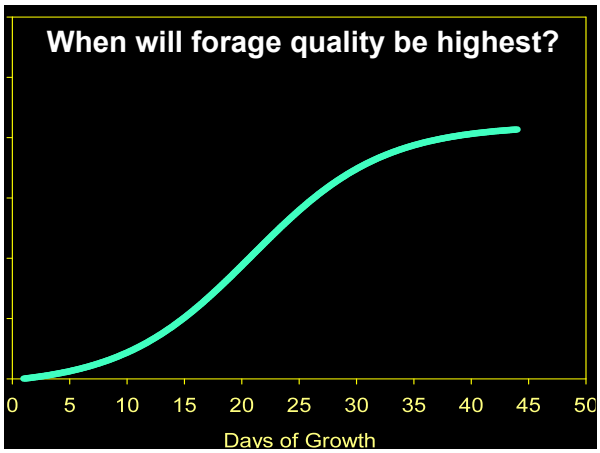

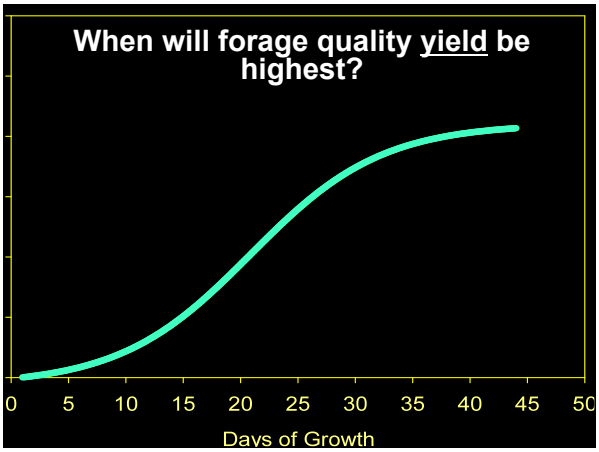

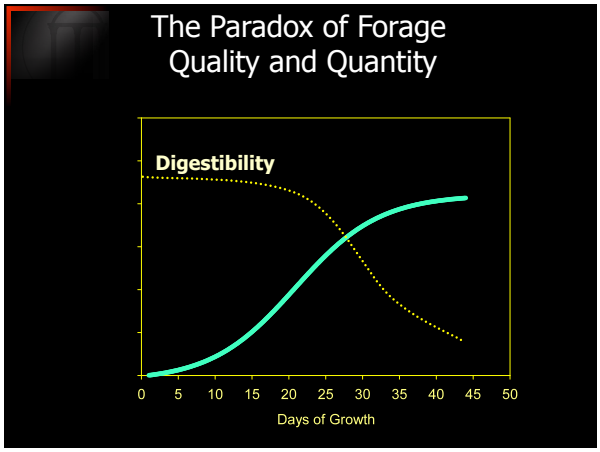

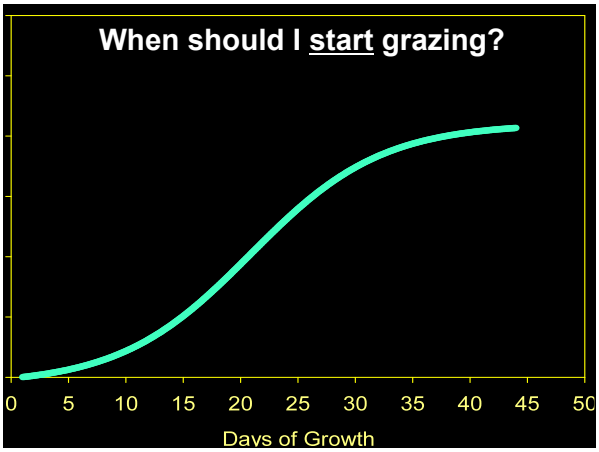

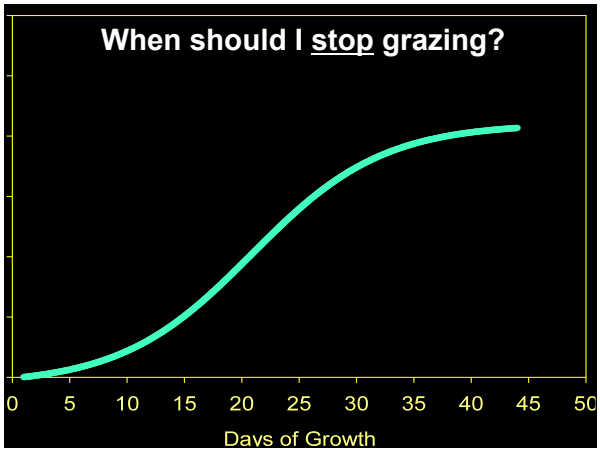

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Benefits of Rational Grazing

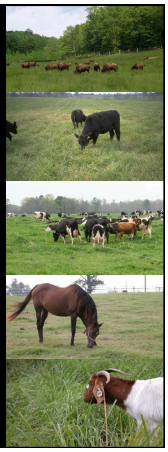
1. Better utilization of forage
2. Growth rate of forage is optimized
   - Kept in linear/exponential growth phase
   - Higher yield of forage

Animal productivity is primarily a function of feed intake.

Forage Intake

- Animal productivity (gains, milk, fiber, etc.) is primarily a function of feed intake.
- Forage Intake is a function of:
  - Bite size
  - Bite rate
  - Grazing time

$$\text{Forage Intake} = \left(\frac{\text{mass}}{\text{bite}} \text{ x } \frac{\text{bites}}{\text{min.}} \text{ x Minutes}\right)$$



Forage Intake

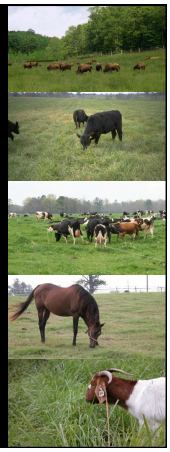
$$\text{Forage Intake} = \left(\frac{\text{mass}}{\text{bite}} \text{ x } \frac{\text{bites}}{\text{min.}} \text{ x Minutes}\right)$$

What happens when:

1. Pastures are very short
2. Pastures are tall
3. The animal's mouth size is below average
4. Animal is ill or uncomfortable (heat stress)
5. Grazing time is restricted

Extra Credit:

a. Animal starts feeling full
b. Forage is very fibrous
c. Intestinal passage rate is slow (fast)



Approximate Diet Selection of Grazing Animals when Given Choice

	Type of Diet		
Animal Species	Grasses	Legumes	Browse
Cattle	65-75	20-30	5-10
Horses	70-80	15-25	0-5
Sheep	45-55	30-40	10-20
Goats	20-30	10-30	30-50
White-tailed deer	30-60	40-50	10-30

Source: Southern Forages, 4th edition.

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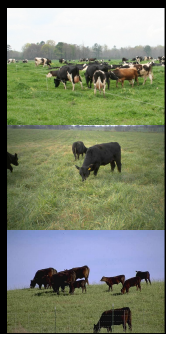
Grazing Behavior: Cattle

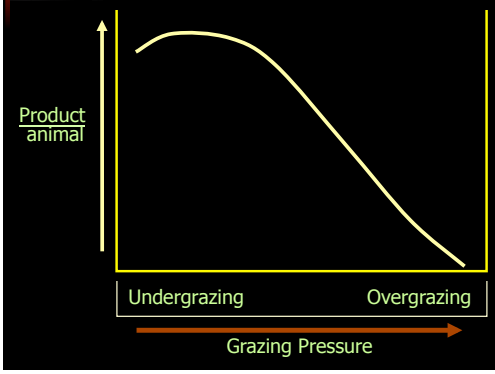
- Spend up to 8 hrs/day grazing
  - "Cows are union members. They refuse to graze more than 8 hours per day." - Voisin
  - Longest bouts are at dawn, late afternoon, and at sunset.
- Grass length affects bite rate:
  - 4-5 in. = swallowed right down
  - 10-12 in. = it has to be masticated.
- Bite rate generally runs 30-90 bites/min.

Grazing Behavior: Cattle

- Grazing time is genetically influenced.
  - Identical twins graze almost exactly the same amount of time (+/- 2%), but differences between pairs of twins will differ (+/-40%).
  - Bite rate is relatively constant (48-54 bites/ min.), but some graze longer and sustain high rate longer.
  - Implication: Good grazers can be selected
- Grazing objectives:
  - ~~Exercise and activity~~
  - Eat and retreat
  - Meet nutritional needs
  - Maintain relatively full gut



Productivity Per Animal vs. Per Acre



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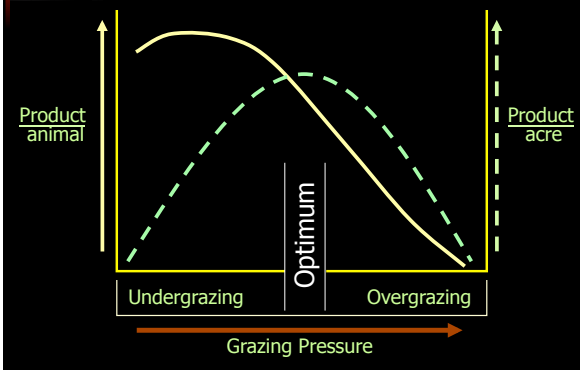

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Effects of rotational stocking on performance of beef cattle grazing bermudagrass and endophyte-free tall fescue in central Georgia.

Item	Continuous	Rotational	Difference*
Cow weight at calving, lbs	1037	1017	NS
Cow weight at weaning, lbs	1090	1071	NS
Stocking rate, cows/acre	0.50	0.69	+38%
Pregnancy rate, %	93	95	NS
Weaning weight, lb	490	486	NS
Calf production, lb/ac	243	334	+37%

* NS = not statistically significant

Increase in gain per acre in rotational compared to continuous stocked pastures in studies from various southern states.

State	% Increase
Arkansas	44
Georgia	37
Oklahoma	35
Virginia	61

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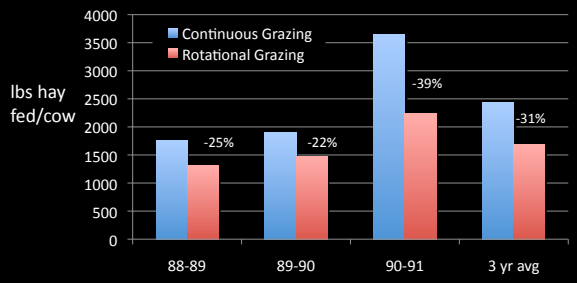
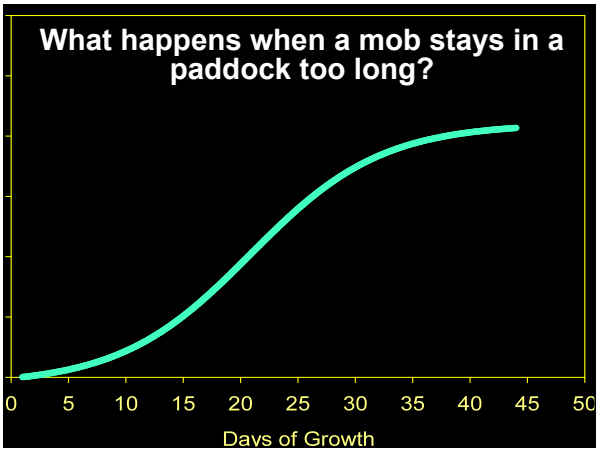
Effect of Grazing System on Hay Needs



$37.54/cow savings using $100/ton hay

What happens when a mob stays in a paddock too long?



Recreational Grazing

(Selective)

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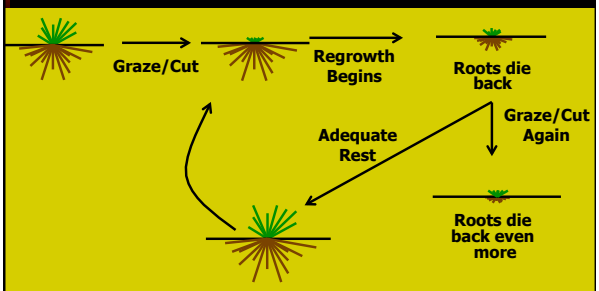
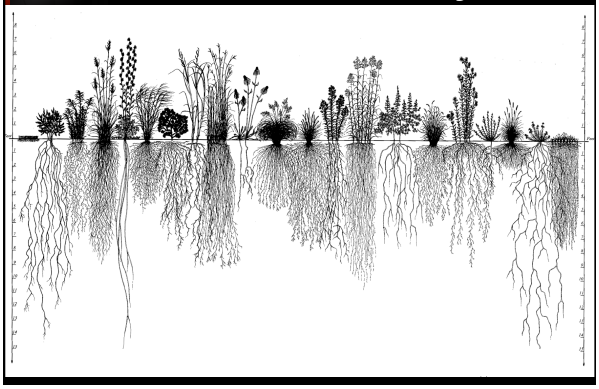
6. Better persistence of desirable forages
   - Especially clover and legume species

What you don't see….



"More than meets the eye…"



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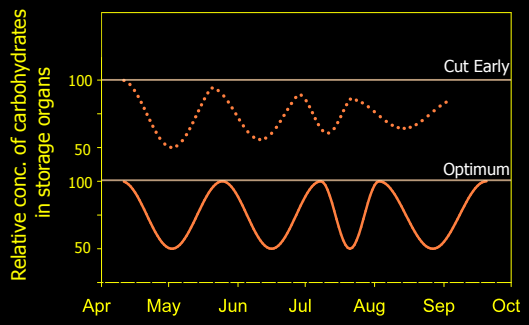

Management of residual stubble height and rest period ("length of round") on carbohydrate storage in Tifton 85 stems/stolons.*

Stubble Height	Rest Period or "Round" (d)		
	14	21	28
in.	---------- *(g TNC/m²)* ----------		
3	8.4	13.3	6.5
6	42.8	34.5	48.2
9	40.2	43.5	61.5

* Adapted from Liu et al., 2011. Crop Sci. TNC = Total non-structural carbohydrates.

Management of residual stubble height and rest period ("length of round") on effective Tifton 85 yields.*

Stubble Height	Rest Period or "Round" (d)		
	14	21	28
in.	---------- *(lbs/acre)* ----------		
3	8714	9844	11807
6	9160	8625	9993
9	11033	9100	8565

* Adapted from Liu et al., 2011. Crop Sci. Yields are grazing season totals (3-yr avg.) and include only that forage above the managed residual stubble height. SH did not affect CP or IVOMD. Both CP and IVOMD dec. (L from 60.2% to 58.2%) as rest inc. from 14 to 28 d.

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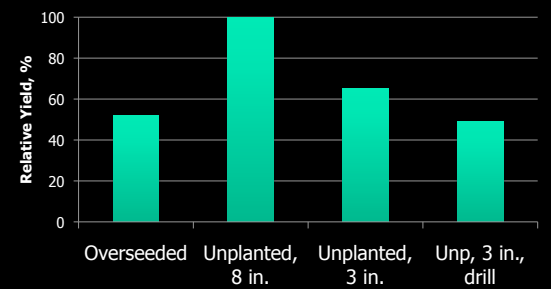
6. Better persistence of desirable forages
   - Especially clover and legume species
7. Better weed suppression

Yields of Spring Green-Up of Tifton 85 as Affected by Overseeding and Residual Stubble Height Entering Dormancy*

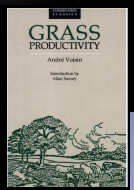


* Adapted from Reis et al., 2009. Forage & Grazinglands

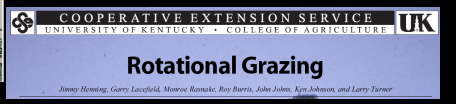
BMP: Tifton 85 Grazing Management

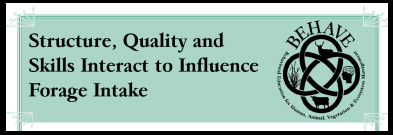
- Plan for 14-20 day rounds
  - Early season, longer
  - Late season, quicker
- Leave 5-8 inches of residual
  - Early season, low end of the range will be fine.
  - Late season, high end of the range is best
- Taking a hay/baleage cutting as needed is fine!
  - Short residual (2-3 in.)
  - But, allow > 20 d recovery.
  - Good for the stand!

Resources



Grass Productivity – Andre' Voisin, 1959.
On Google Books or available for purchase





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