Reading Forages:

Adapting Your Grazing to an Ever-Changing Resource

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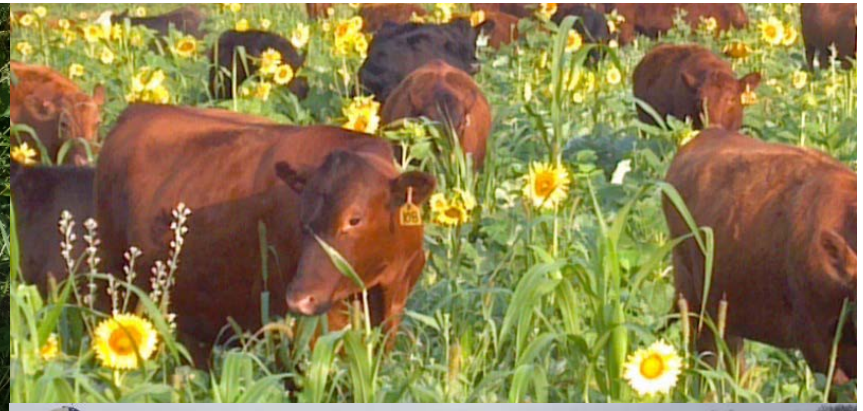
Rogers Cattle Company, LLC

- Start up farm with knowledge, money and dreams
- Operate on 400 acres leased & 100 acres owned land
- Limited equipment
- Enterprise mix
  - Cow-calf/Seedstock (2001)
  - Ewes/lambs-Solar Grazing (2005)
  - Meat goats (2002-2009)
  - Custom grazing (2002-2010)
  - Pasture-Raised Meats
    - Beef (2005)
    - Lamb (2008)
    - Pork (2012)
    - Chicken (2011-2014)
    - Turkey (2011-2013)

Conservation Innovation Grant Project:

Improving Soil Health on Pasture Based Livestock Farms in the Southeastern US

- Improve grazing management and nutrient distribution.
- Soil health assessment for pasture systems.
- Value of mixed species annual crops in perennial forage systems.
- Create a learning environment for producers and support agencies that allows them to develop innovative grazing plans.



AmazingGrazing
NC STATE UNIVERSITY'S
Pasture-Based Livestock Education Program

NC STATE EXTENSION

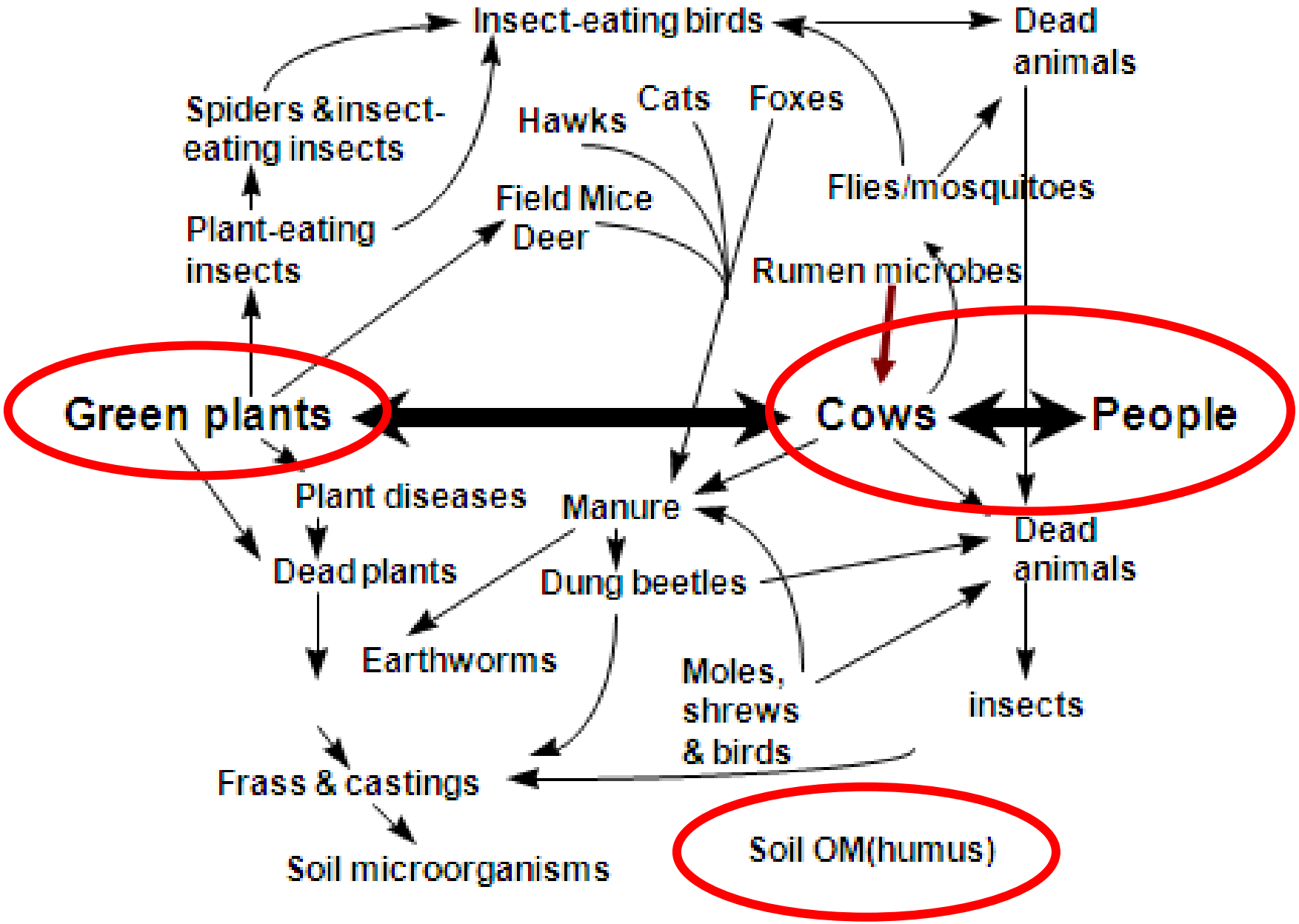
Supported by

The North Carolina Cattle Industry Assessment

GRASS
www.georgiaforages.com

USDA

Partially Supported by USDA-NRCS Conservation Innovation Grant #693A75-14-251


Insect-eating birds
Dead animals
Spiders &insect-eating insects
Hawks
Cats
Foxes
Flies/mosquitoes
Field Mice
Deer
Plant-eating insects
Rumen microbes
Green plants
Cows
People
Plant diseases
Manure
Dead plants
Dung beetles
Dead animals
Earthworms
Moles, shrews & birds
insects
Frass & castings
Soil microorganisms
Soil OM(humus)

What is Adaptive Grazing Management?

The practice of using proven grazing management principles and practices to meet the dynamic, biologic, economic and social needs of individual grazing operations and their communities.

Johnny Rogers, 2020

The Value of Good Pasture?

- **Livestock feed**
- **Soil and water conservation**
- **Water quality**
- **Wildlife habitat**
- **Nutrient cycling**
- **Soil health**
- **Economic return**
- **Esthetics/Lifestyle**

"When you buy an acre of land, you buy 43,560 square feet of solar panel." -Jim Gerrish

You also have a 43,560 square feet rainfall collector……..

Overgrazing is the enemy of good pastures whether in drought or flood

Pastures plants need rest, especially during drought!

Signs of Poor and Good Pasture Situations

Poor Pasture Situations	Good Pasture Situations
Animals continuously overgraze	Sacrifice area set up for animals during wet season
Single, large, patchy pasture with lots of weeds	Several smaller pastures with desirable forages
Large areas of bare ground	Few areas of bare ground
Manure deposition concentrated in one area	Manure deposition scattered evenly

Assessing the Pasture Stand

- **Point Step Analysis is the most practical approach**
- **Randomly walk the pasture and identify plants or bare ground on 100 to 200 points**

Figure 1. Point Step Worksheet

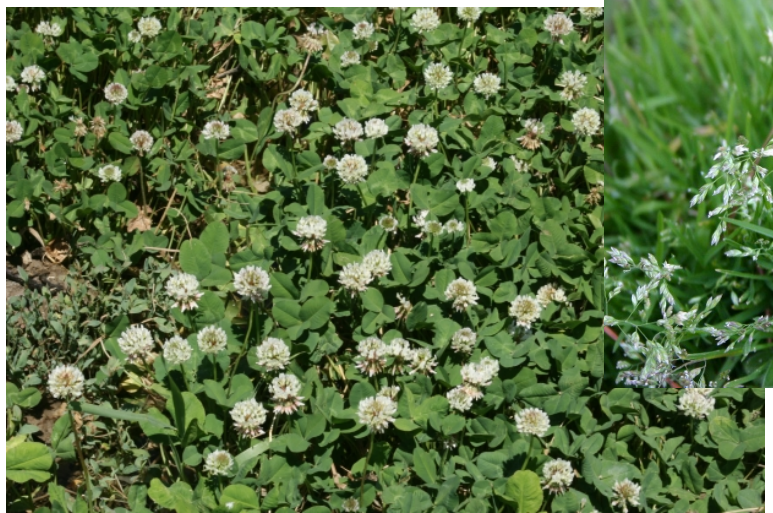
Pasture #	Tall Fescue	Orchard -grass	White Clover	Buttercup	Other Desirable	Other Undesirable	Bare Ground	Total
1*	34	3	9	17	4	4	29	100
2								

* Pasture 1 shows signs of heavy horsenettle and dog fennel population.


Desirable grass
Bare ground
Weed
SAMSUNG
cellitel

Indicator Species - Repetitive Close Grazing

- **Annual bluegrass**
- **White clover**
- **Chickweed**
- **Buttercup**



Indicator Species - Compacted Soils

- **Horsenettle**
- **Annual bluegrass**
- **Quackgrass**
- **Goosegrass**
- **Prostrate Knotweed**





Root development is strongly related to frequency and extent of leaf removal

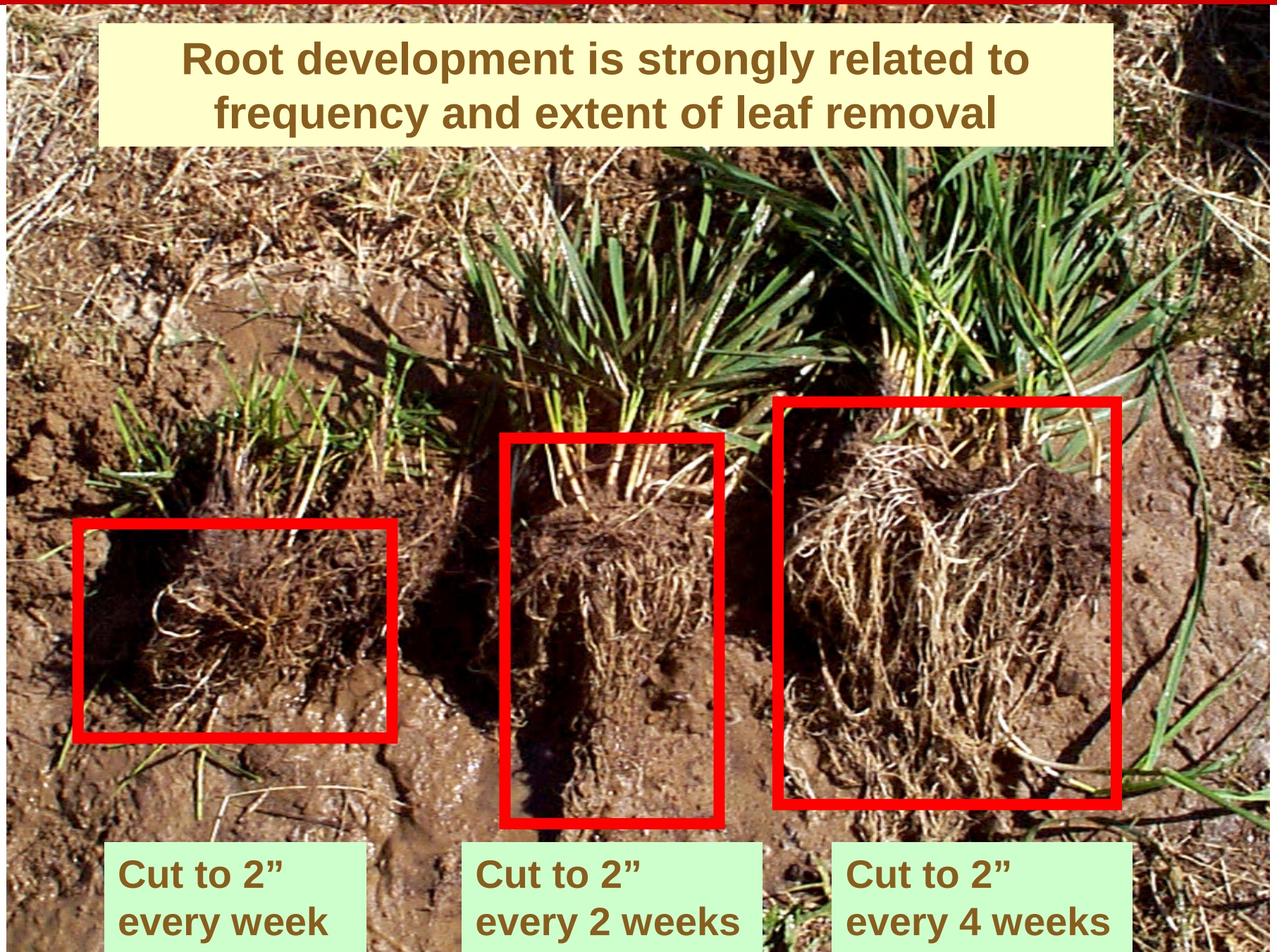


Figure 1. Point Step Worksheet

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1*	34	3	9	17	4	4	29	100
2								

* Pasture 1 shows signs of heavy horsenettle and dog fennel population.

50% Desirable species (Fescue, Orchard, Clover, Other Desirable)
9% Clover
21% Weeds. Mostly Buttercup.
29% Bare Ground

Interpretation?

- **Overgrazing may be an issue (bareground)**
- **Not enough clover to worry about (chemical treatments)**
- **Candidate for weed control only with rest, or complete renovation.**
- **Spray to control buttercup later winter and/or wait and spray for the other perennial in late spring. For full renovation spray with glyphosate and plant summer annual.**

Soil Test and Follow Fertility Recommendations

Sample hayfields every year and 1/3 of your pastures each year

Do Not Cut Out Lime

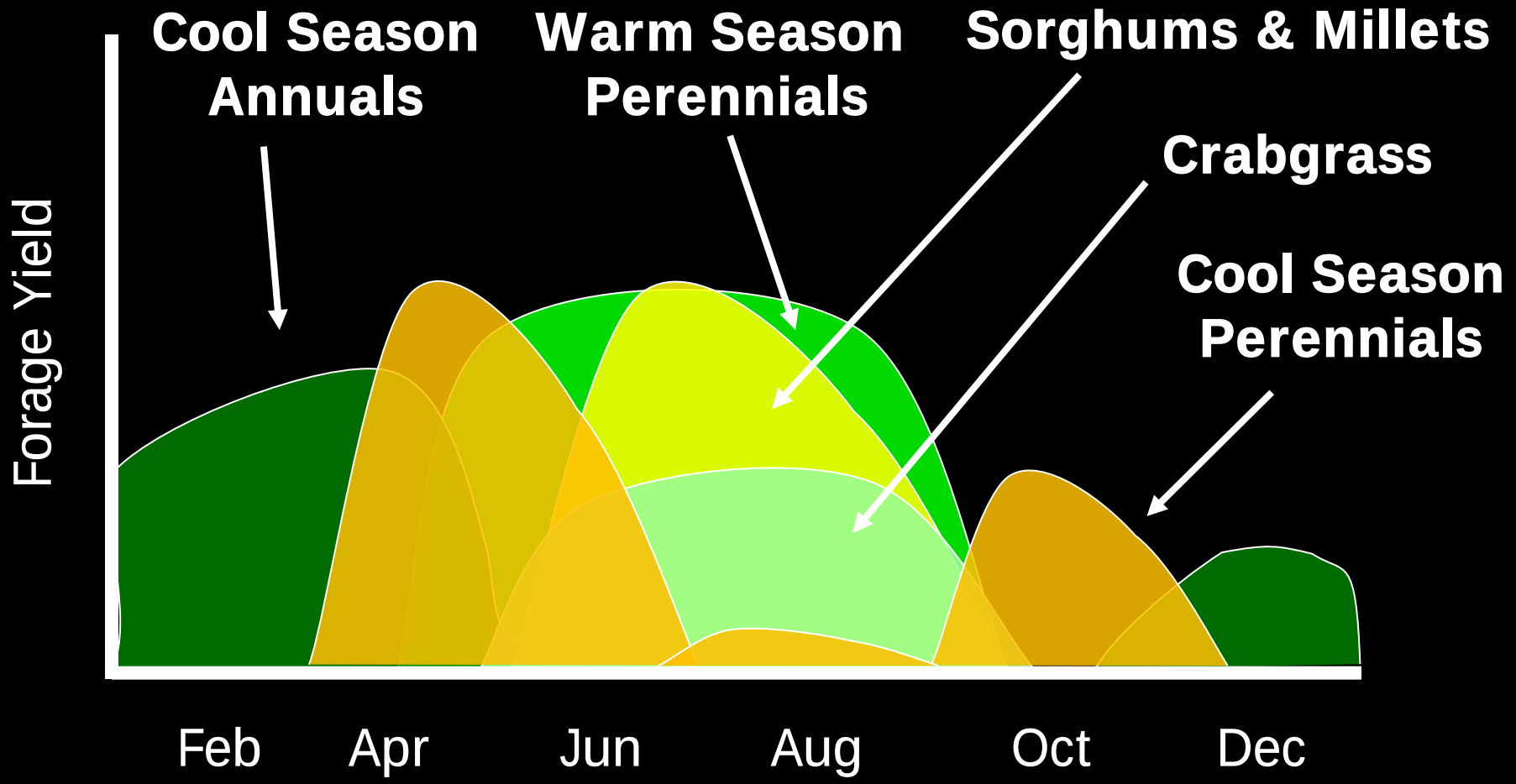
Get your priorities right!

Lime is still job #1

6-12 months prior to seeding

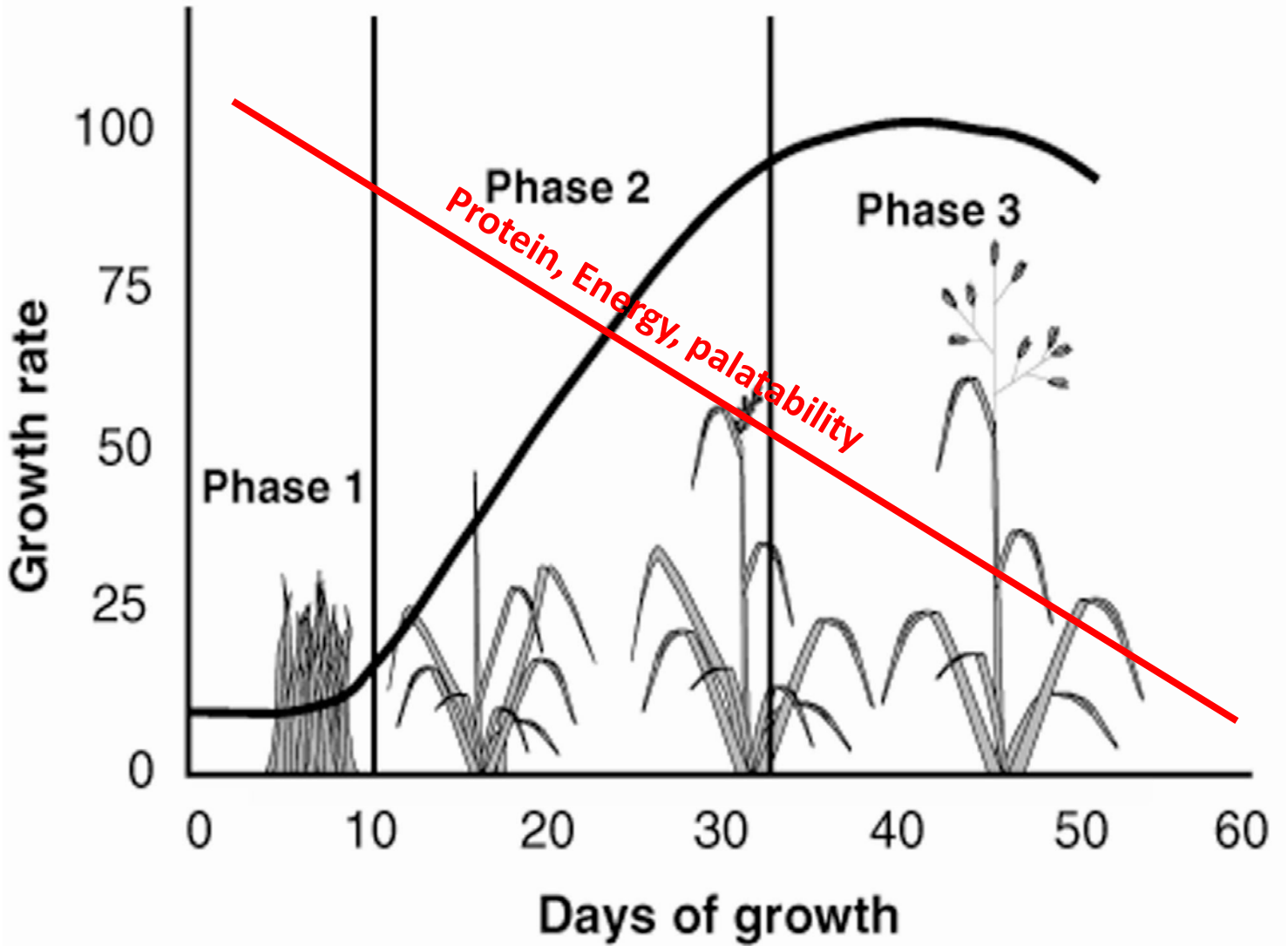
NC STATE EXTENSION

Forage Distribution In The Mid-Atlantic Region



Plant Growth Phases

Quality – Quantity Compromise



Forage Maturity Matters

Effect of tall fescue stage of harvest on forage quality and animal gain*

Stage of harvest, date of cutting	Dry matter intake lbs./day	Percent digestibility	Percent protein	Feed efficiency, lb. hay fed per lb. of gain	Yield, lbs. per acre	Gain, lbs. per day
Late boot to head, May 3	13.0	68	13.8	10.1	1,334	1.39
Early bloom stage, May 14	11.7	66	10.2	13.5	1,838	0.97
Early milk stage – seed forming, May 25	8.6	56	7.6	22.5	2,823	0.42

*Holstein heifers were used, average weight – 500 lbs.
Source: University of Tennessee, reported in AGR-62, Quality Hay Production, University of Kentucky Cooperative Extension Service.

Source:https://www.hayandforage.com/article-1933-it%E2%80%99s-true-for-fescue-too.html

Animal Forage Demand

Weight and Number of Livestock

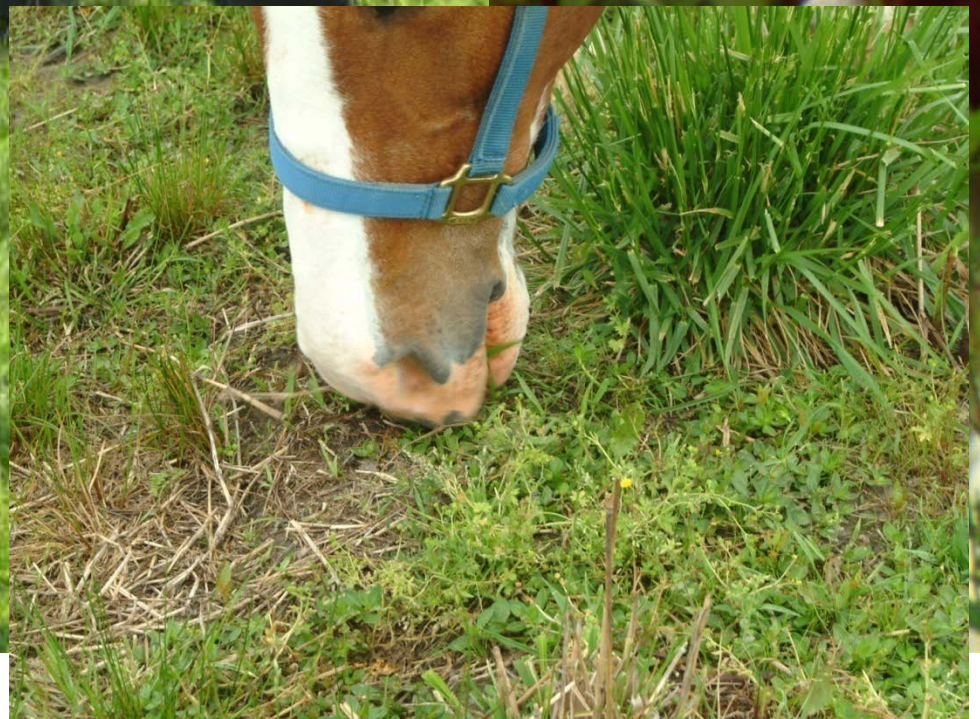
- Carrying Capacity
- Stocking Rate

Management

Livestock Nutrient Requirements

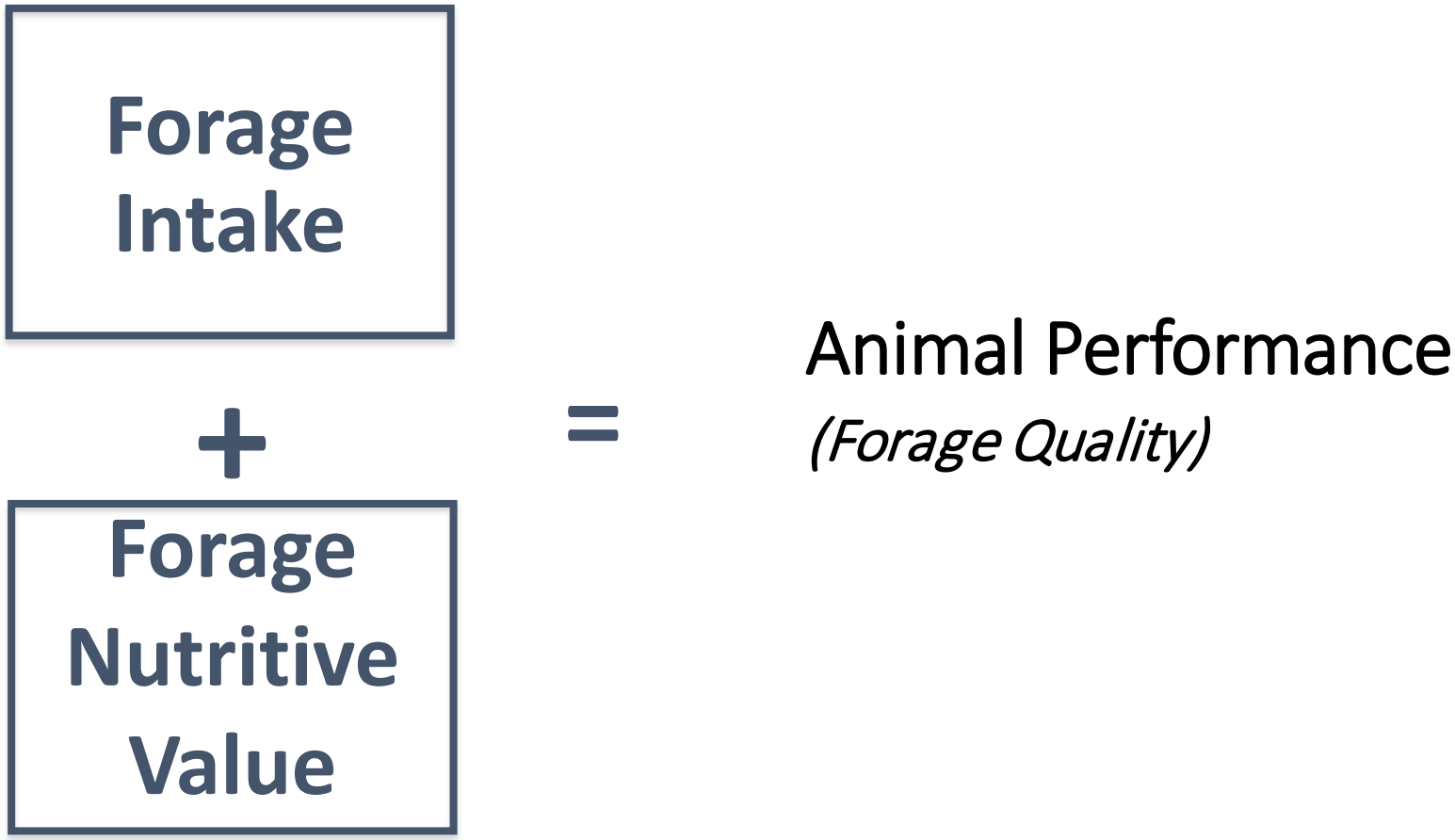
- Species
- Class or sex
- Size or age
- Breed or Breed Type
- Growth or gain rate
  - Body condition score
- Stress Level
- Health

Understanding Grazing Behavior



Diet preferences% of diet

Plant	Horse	Cattle	Sheep	Goat
Grass	90	70	60	20
Weed	4	20	30	20
Browse	6	10	10	60



Adapted from Adesogan et al. (2011) Factors Affecting Forage Quality
http://edis.ifas.ufl.edu/ag161

Grazed Forage Intake

- Quantity/Availability
  - Cool Season: accounts for ~75% variation
  - Warm Season: accounts for ~50% variation
  - Proper stocking rates - be conservative/flexible
  - Grazing management
    - Post-grazing residual
    - Rest-period (combining groups of cattle)
- Quality
  - Cool Season: accounts for ~25% variation
  - Warm Season: accounts for ~50% variation
  - Grazing management
  - Species selection (cow-calf vs stocker vs finisher)
- Evaluate animal behavior, gut fill and fecal consistency

Available Forage

Factors that affect FORAGE INTAKE:

Animal nutrient requirements

- ✓ **Body weight**
  - ✓ Heavier animals > lighter animals
- ✓ **Rate of body weight gain**
  - ✓ Increase as daily gain increases
- ✓ **Breed**
  - ✓ Simmentals > Hereford steers (19 %); Brahman < British breeds (10 %)
- ✓ **Sex**
  - ✓ Intact males > castrated males and females (15 %)
- ✓ **Age**
  - ✓ Younger animals are smaller
  - ✓ Need a higher quality diet
- ✓ **Temperature**
  - ✓ Cold stress – Depends on hair coat and if it is dry or wet (5 to 20 %)
- ✓ **Physiological state**
  - ✓ Lactation stage (20 %), milk production, pregnancy stage, stress,…
- ✓ **Previous nutrition**
  - ✓ Compensatory gain
  - ✓ Body composition
- ✓ **Activity**
  - ✓ Distance walked for grazing, terrain, …

Species Dry Matter Intake Comparisons

Species	Forage Dry Matter Intake, % Body Wt.	
	Dry, Gestation	Lactating
Brood cows	1.5-2.5	2.0-2.7
Growing cattle	2.3-2.9	
Ewes	1.7-2.0	3.8-4.2
Growing lambs	3.2-6.0	
Does	1.8-2.0	3.5-4.0
Growing kids	3-4.5	

Source: Beef Cattle NRC, Sheep NRC, Langston University

Temperature Affects Intake

Table 27-1. Effect of Temperature and Night Cooling on Feed Intake.

Temperature, Degrees F	Intake Percentage
>95, no night cooling	65
>95, with night cooling	90
78 – 95	90
59 – 78	100
41 – 59	103
23 – 41	105
5 – 23	116

Nutrient Requirements of Beef Cattle, NRC, 1996.

Hair Shedding Scores

Hair Score	Definition	Example
5	Full winter coat (0% shed)	
4	Coat exhibits initial shedding (~25% shed)	
3	Coat is halfway shed (50% shed)	
2	Coat is mostly shed (~75% shed)	
1	Slick, short summer coat (100% shed)	

How can we determine if livestock are achieving adequate intake?

- Animal Behavior
- Gut fill
- Fecal Consistency

Fecal Consistency

Managing Forage Quality

"Brood Cow Forage"

- Mature, dormant forage
- Lower digestibility
- Protein supplement to increase intake

"Growing Cattle Forage"

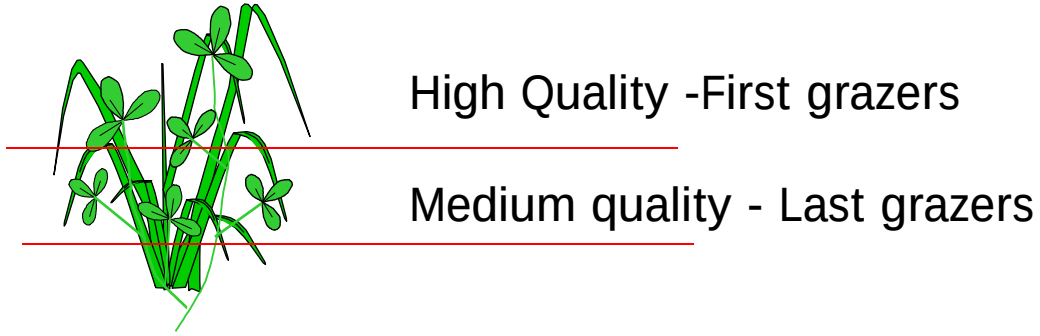
- Lush growing forage
- Moisture may limit intake
- Hay supplementation may increase gain (Dry matter intake)
- Energy supplement may/may not be profitable

Matching Animal Requirements to Forage Quality

- Managing the Spring Flush
  - Flexible stocking rate
  - Use N fertilization strategically
    - Fescue Toxicosis
  - Drop paddocks
  - Summer Stockpiling
  - Hay production
  - Adaptive Grazing
  - Fall Stockpiling

Matching Animal Requirements to Forage Quality

- Can use different stages of quality to our advantage
  - Adjust body condition score
    - Increase, maintain, or decrease body condition
  - Creep grazing
    - Calves allowed to creep gaze into higher quality pasture
  - “Leader – Follower” grazing
    - Animals with highest nutrient needs graze pasture first followed by those with lower nutritional needs

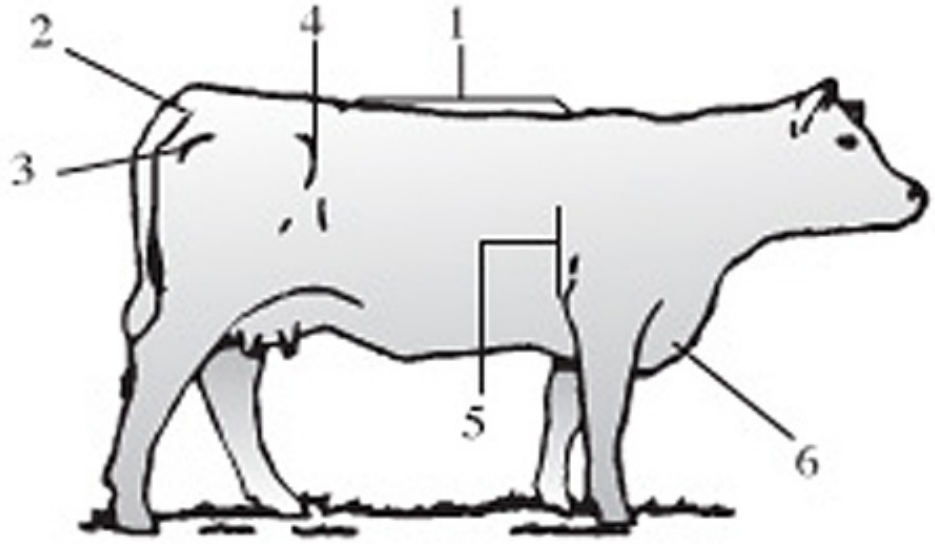


Body Condition Scoring

Reproduction is the key profit driver in the cow-calf (ewe-lamb; doe-kid, etc.) business and most reproductive failures are due to poor nutrition.

Beef Cattle Body Condition Scoring

- Evaluate the nutrition program over the previous few months
- Track performance over time
- 1-9 system is most common for beef cattle
  - 1-3 Thin
  - 4-6 Moderate
  - 7-9 Fat
- Weight Difference in BCS
  - 70-140 lbs.
  - ~90 lbs.*
- Go from BCS 4 to 5
- 90 days = _____ ADG
- 30 days = _____ ADG

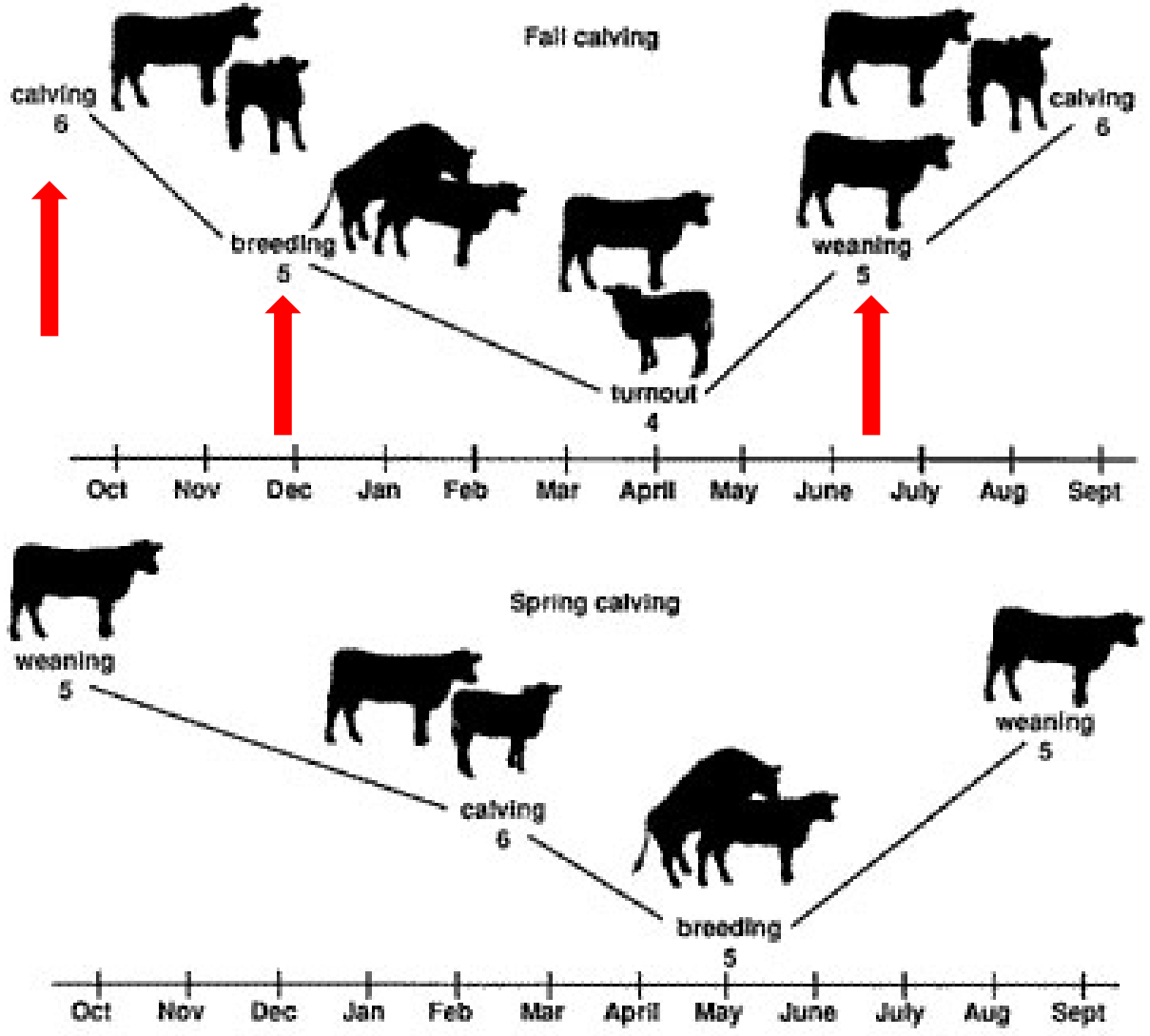


1. Back
2. Tail Head
3. Pins
4. Hooks
5. Ribs
6. Brisket

Relative Influence of Body Condition Score at Calving On Pregnancy Rate

Selk et al. (1998)
J. Anim. Sci. 66:3153-3159

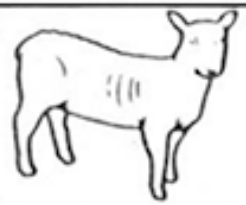
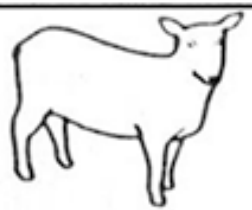
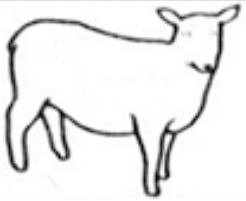
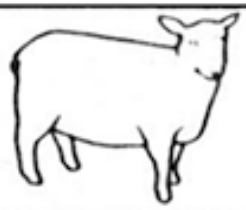
Cattle BCS Production Phase Changes



http://extension.missouri.edu/p/G2230

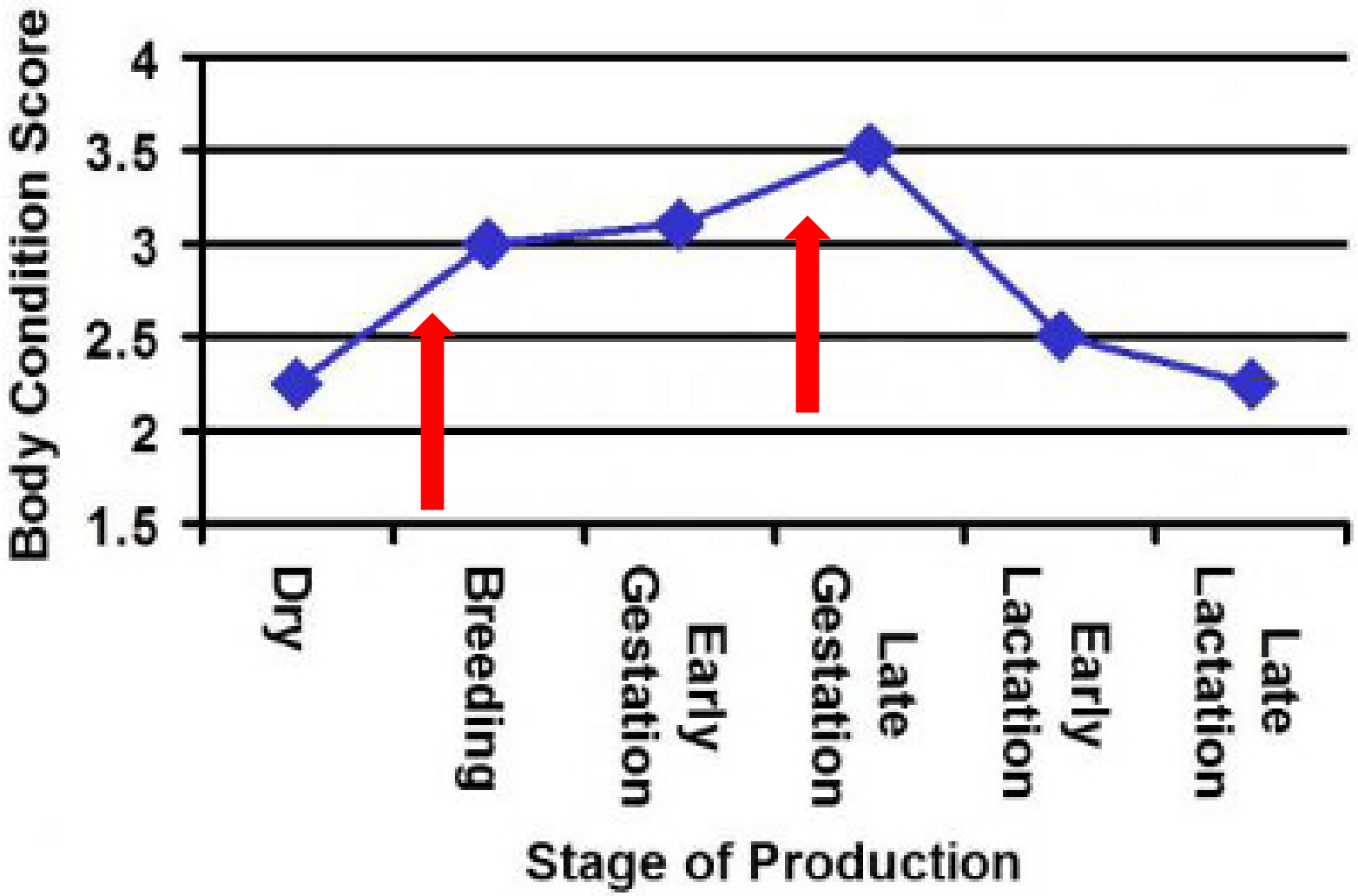
Sheep and Goat Body Condition Scoring

Optimal Range 2.0-3.5

Score		Description	
1		Spine sharp, back muscle shallow,	Lean
2		Spine sharp, back muscle full, no fat	
3		Spine can be felt, back muscle full, some fat cover	Good Condition
4		Spine barley felt, muscle very full, thick fat cover	Fat
5		Spine impossible to feel, very thick fat cover, fat deposits over tail and rump	

Source: http://duval.ifas.ufl.edu/goats-sheep/sheep-nutrition.shtml

Sheep/Goats BCS Production Phase Changes

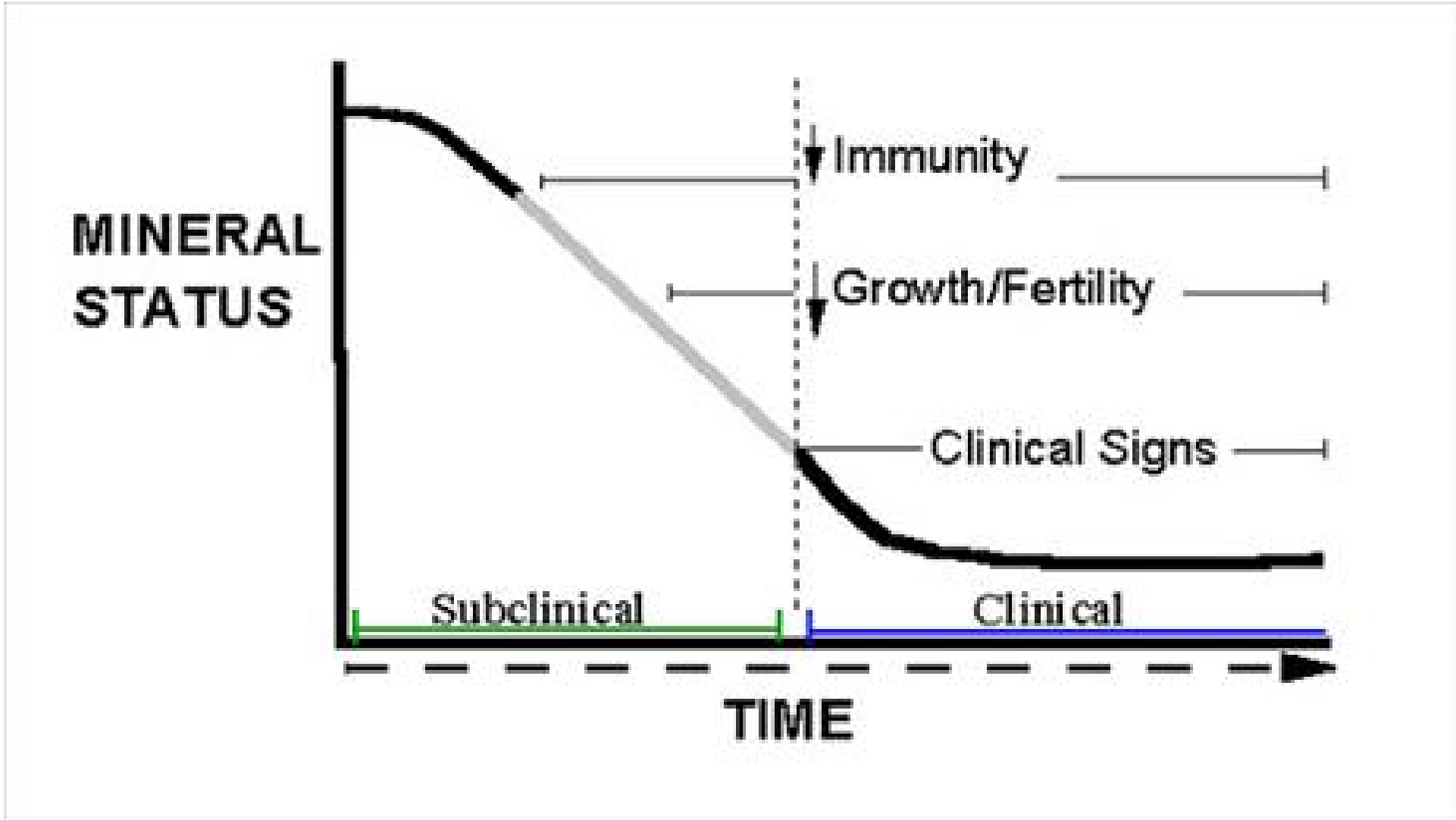


Supplementing Forage Based Diets

Free Choice Mineral-Vitamins

- Forages grown for livestock are often deficient in one or more minerals.
- Experience has shown that a good mineral supplement program is critical to good performance.
- Symptoms of mineral deficiencies:
    - Rough discolored hair coats
    - Low breeding rates
    - Low body condition
    - High incidence of health problems including lameness, pinkeye or retained placenta.
- Common mineral deficiencies in the Southeast/Mid-Atlantic region
    - Salt
    - Copper
    - Zinc
    - Selenium
- Specie considerations:
    - Copper requirements/tolerance: Cattle>>>>Goats>>Sheep
    - Goats can develop urinary calculi (Ca:P ratio 1.2-1.5:1)
    - Se deficiency = white muscle disease

Mineral Deficiency Symptoms



Source: http://farmprogress.com/story-copper-key-cattle-immunity

Mineral Intake/Economics

- Mineral pricing: $16-$22/50 lb. bag.
- 4 oz. intake/day with some 2 oz. intake available.
- Intake is important
    - Cost
    - Nutrition
- Remember 4 oz. = 0.25 lb./day
    - Every 4 cows consume 1 lb. mineral/day (average)
- Example producer:
    - 40 cows
    - 10 lb./day
    - $20/50 lb. bag 4 oz. intake mineral ($0.40/lb.)
    - $0.10/head-day (10 lb. x $.40 = $4/40 head)

Supplement Economics

24% Protein/Energy Tub

- 200# @ $100/tub
- Expected intake 2 lbs/day
- Waste? minimal
- Delivery? Convenient
- Cattle Access? 24-7
- Cost = $1.00/head/day

Corn Gluten Pellets

- $380/ton (3 ton deliver)
- 22% CP DMB
- Storage?
- Feeding method
  - Trough? >1 feet/head
  - Ground? Waste? 5%?
- Delivery?
  - Frequency? 3x week
  - Cost? $0.05 - $0.25/cow/day
- Cattle Access? 3x/week; boss cows?
- Cost = 2.4 lbs x $0.19 = $0.456/cow/day + delivery = $____

Summary

- Inventory your forage resources.
- Build a grazing plan around your forage production
- Align livestock nutrient needs with seasonal forage production to minimize harvested forage and supplement needs.
- Reproduction is the key profit driver in the livestock business and most reproductive failures are due to poor nutrition.
- Careful observation of body condition will allow for nutritional adjustments before critical production periods.
- Provide supplementation when needed based on forage analysis and an understanding of livestock nutrient requirements.
- Don’t be afraid to make mistakes……they are rarely fatal.
- Pasture based livestock systems using sound grazing principles provide tremendous economic and ecological benefits to our society.

Amazing Grazing
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NC Choices

Thank you
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NC STATE EXTENSION

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CATTLEMEN'S NORTH CAROLINA ASSOCIATION
The North Carolina Cattle Industry Assessment