Master Beef Producer

VALUE • QUALITY
TENNESSEE CATTLE
PERFORMANCE

UT Extension

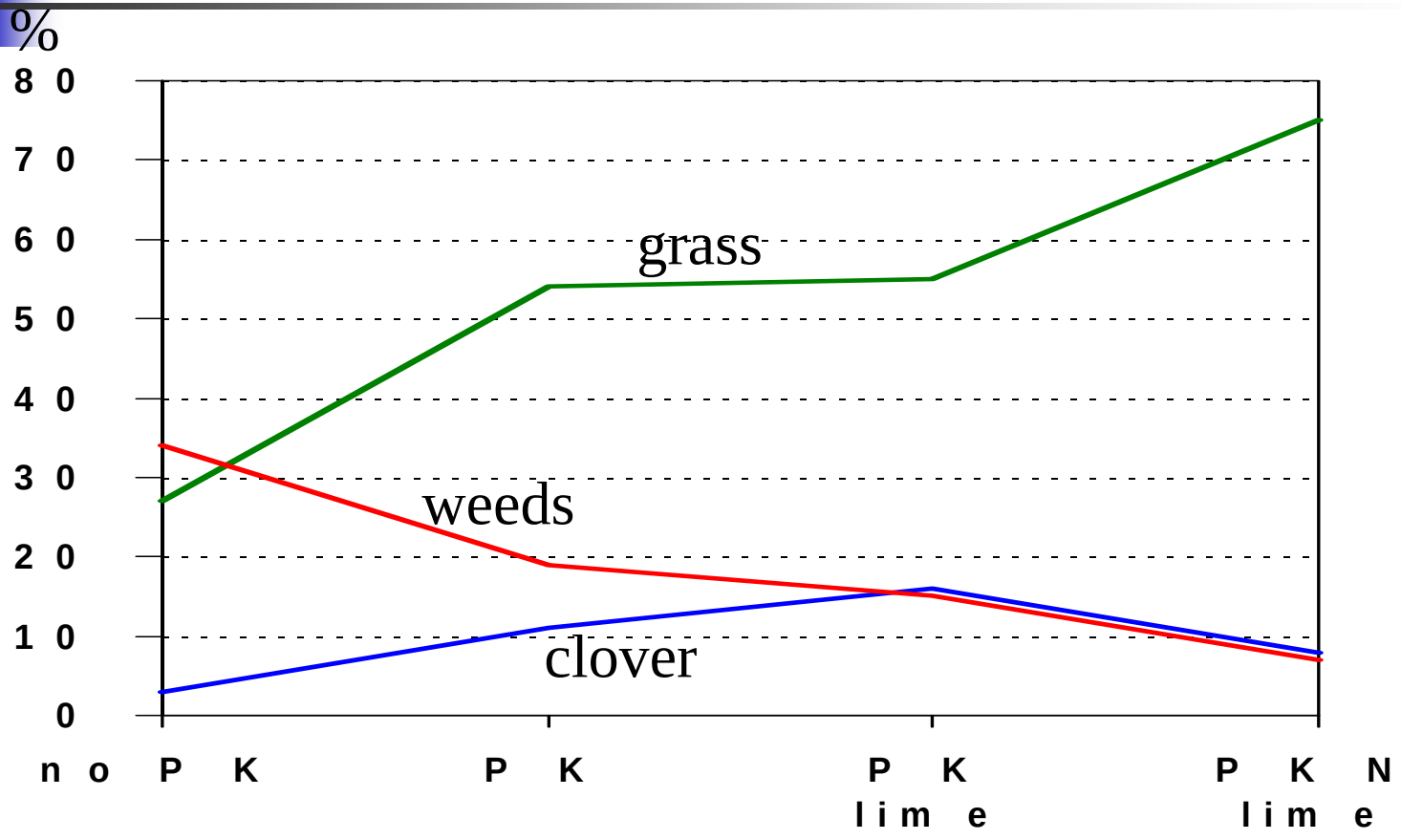
Tennessee Beef Cattle Improvement Initiative

Forage Production for Cow-Calf Operations

Basic Steps to Improve Pastures

- Fertilize by soil test

Effect of fertility on composition of unimproved pasture



Forages. 1995. Iowa St Press

Pounds of nutrients removed by crops

	tall fescue 3.5 ton	bermuda 8 ton
nitrogen	135	368
phosphate	65	96
potash	185	400

Ball and co-workers. 1996. Southern Forages.

Basic Steps to Improve Pastures

- Fertilize by soil test
- Control weeds

Timing Effect on Buttercup control

1997, Blount County- buttercup control

	rate	Mar 17	Apr 25
2,4-D ester	2 pt	99	70
2,4-D ester	4 pt	99	85

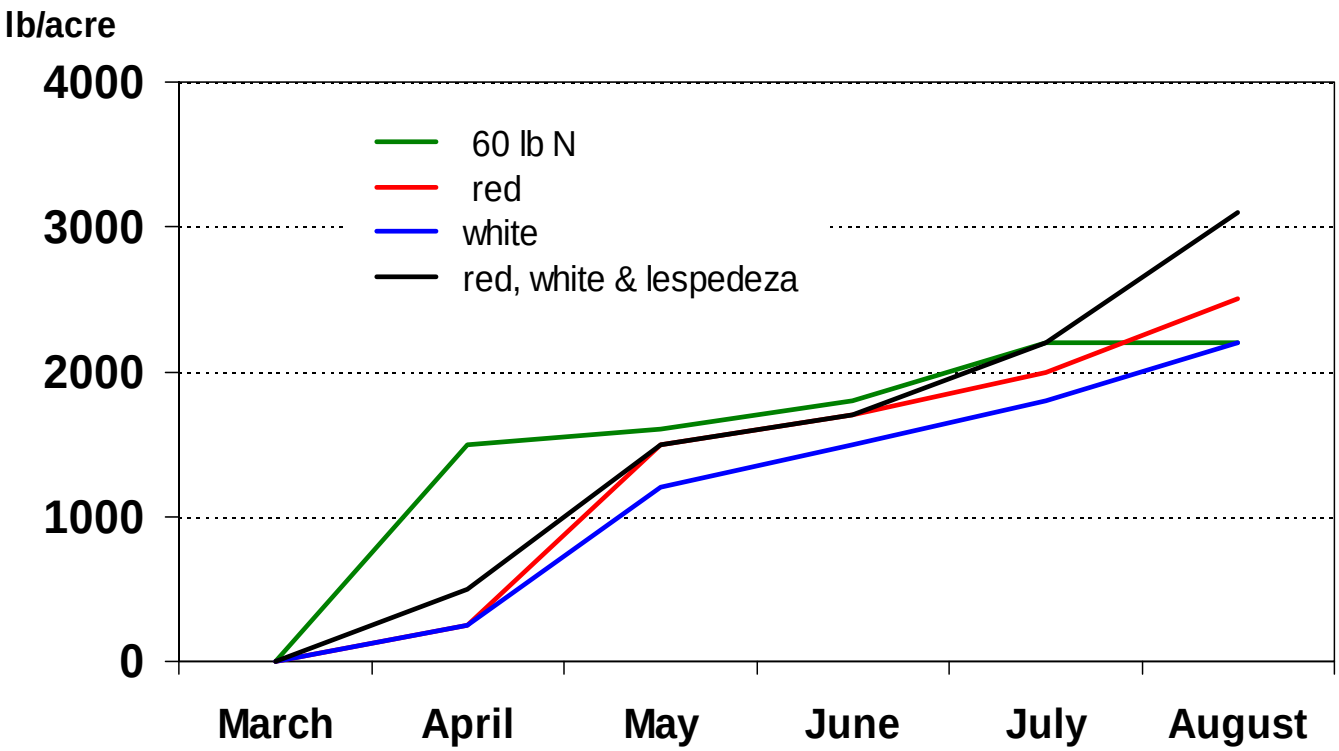
Basic Steps to Improve Pastures

- Fertilize by soil test
- Control weeds
- Use clovers

Benefits of legumes

- Improved quality
- Decreased need for nitrogen
- Possibly lengthen grazing season

Cumulative yield of tall fescue/clover mixtures



Fribourg, H. A. 1978. Tennessee Farm and Home Science. 107:16-17.

How to plant legumes

When - Feb 15 to April 1

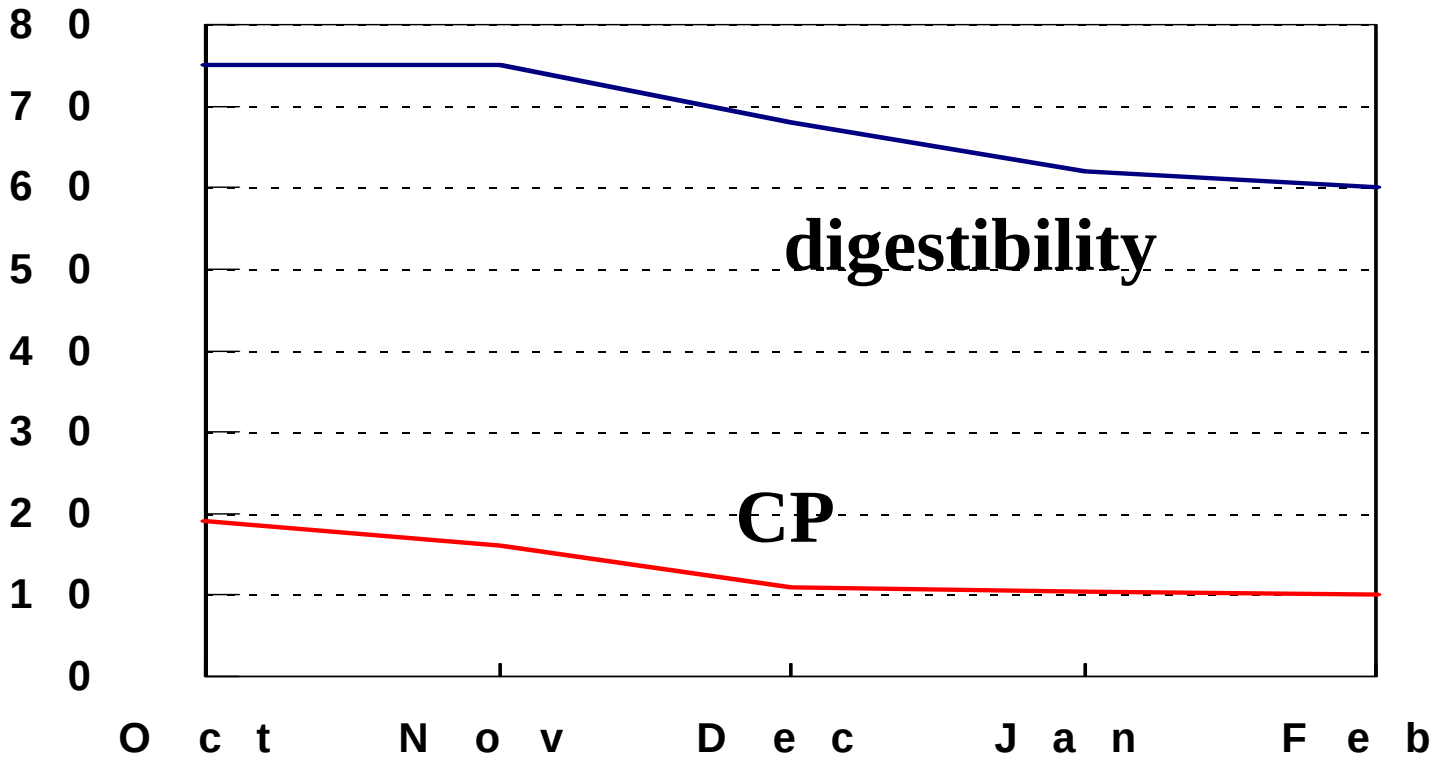
What - 2 lb white clover
4 lb red clover
8 lb annual lespedeza (hillsides)

How - before March 1broadcast
after March 1 drill

Basic Steps to Improve Pastures

- Fertilize by soil test
- Control weeds
- Use clovers
- Stockpile tall fescue in fall

Quality of Stockpiled Tall Fescue



Ross and Reynolds, 1979

Steps to stockpiling

1. Clip pastures in late August.
2. Fertilize with 180 lb ammonium nitrate after good rain.
3. Keep animals off until after frost.

Basic Steps to Improve Pastures

- Fertilize by soil test
- Control weeds
- Use clovers
- Stockpile tall fescue in fall
- Store hay under cover

Hay loss with various storage methods

storage method	percent loss
barn	6
hay tarp	12
uncovered, on ground	35

Managing pastures to improve yield and utilization

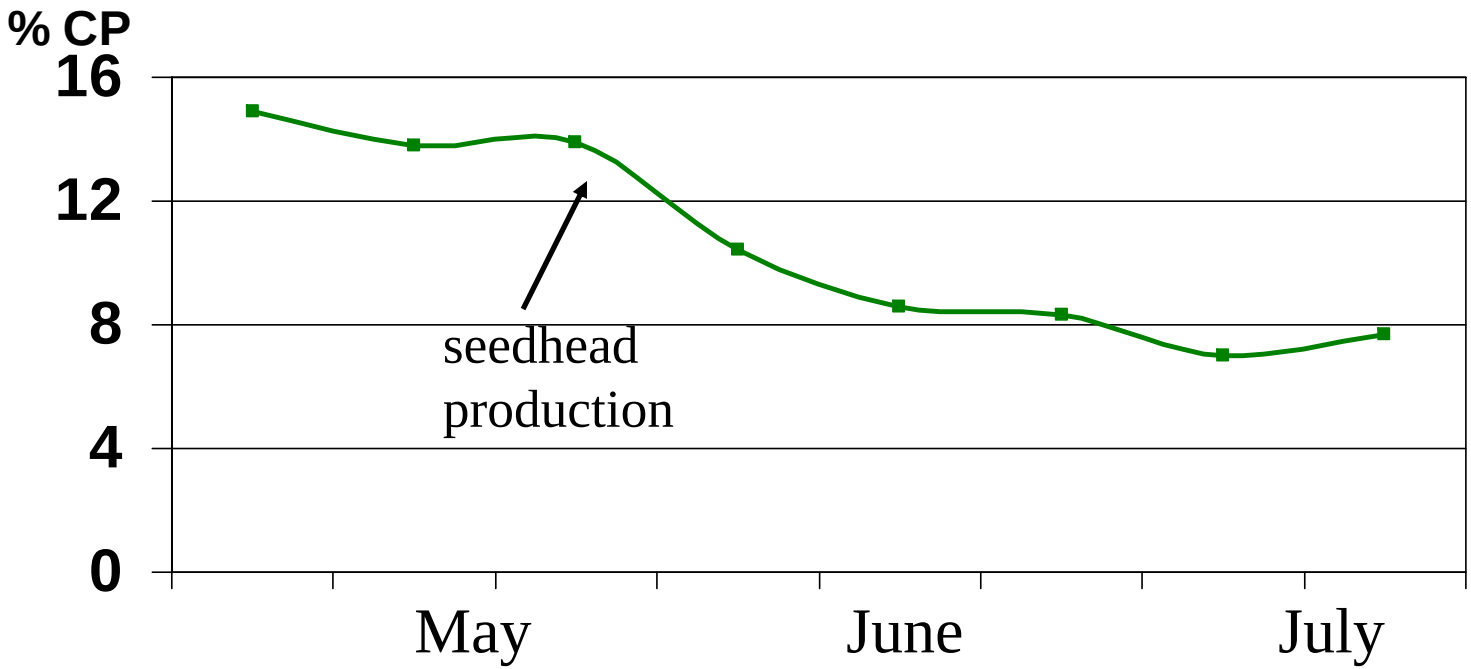
- Incorporate basic practices
- Manage for yield and quality

As forage matures, quality decreases

- lower protein, energy
- more fiber

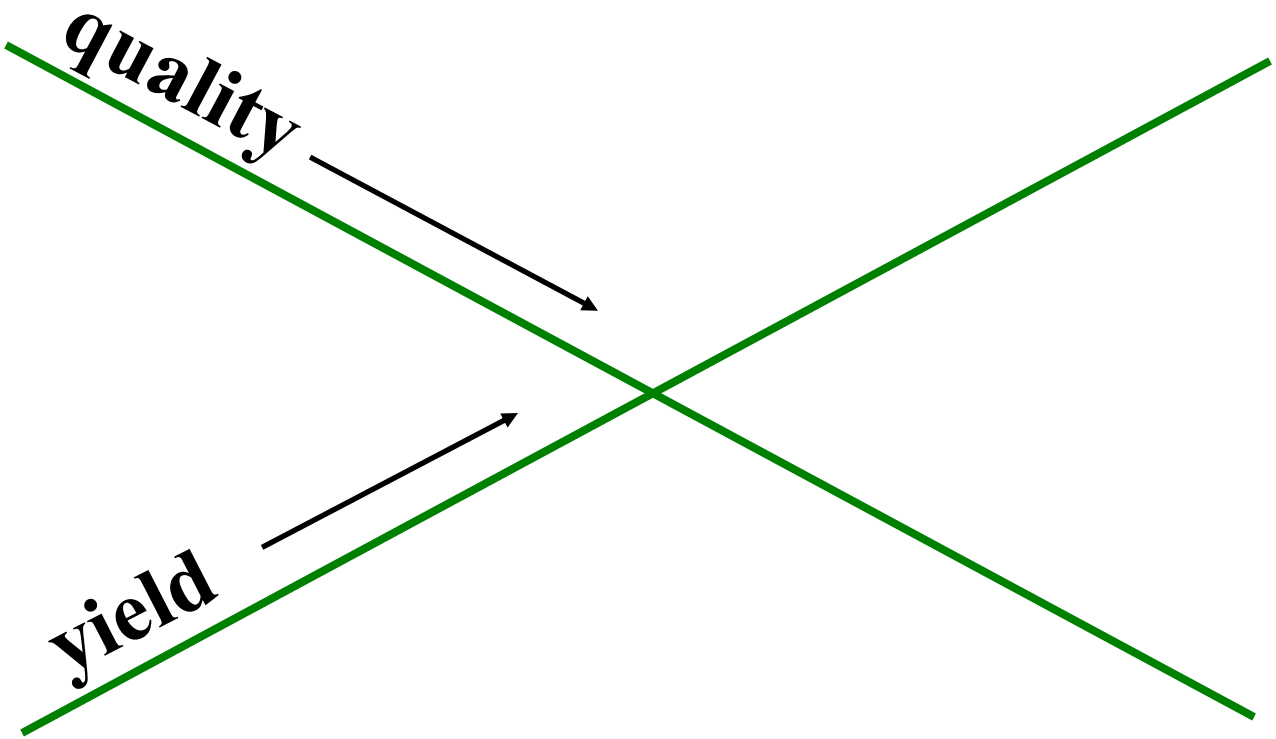
But yield increases

Tall fescue protein content as plants mature



Bates. 2000. Unpublished data. Plateau Experiment Station.

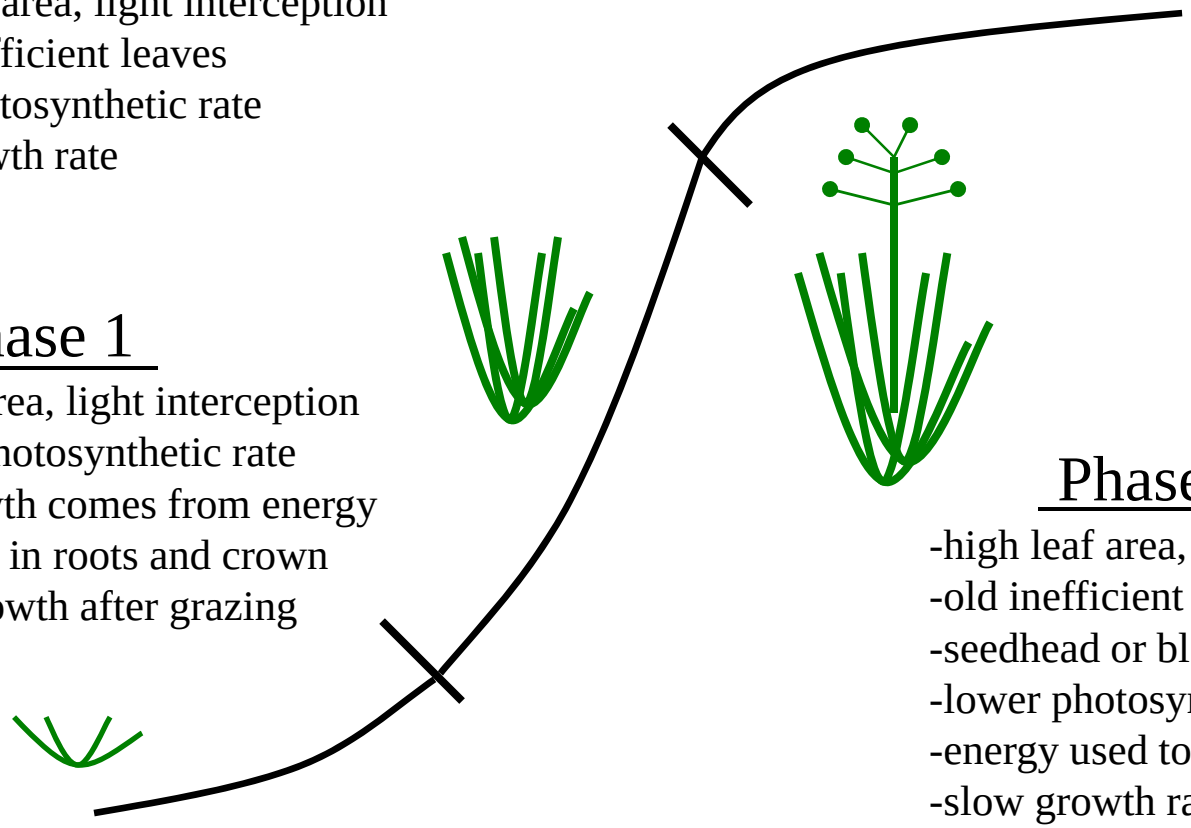
Quality versus Yield



Plant growth rate at various stages of growth

Phase 2

-high leaf area, light interception
-young, efficient leaves
-High photosynthetic rate
- fast growth rate

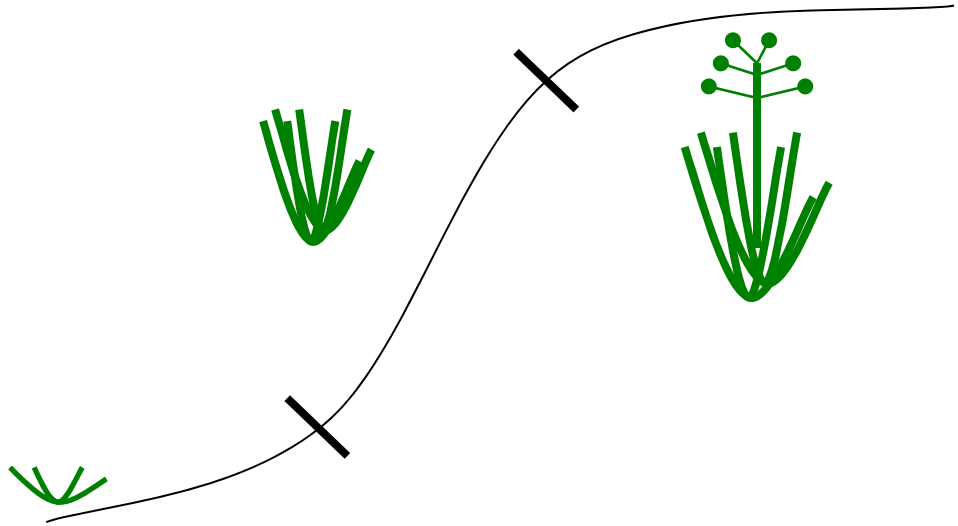


Phase 1

-low leaf area, light interception
-reduced photosynthetic rate
- new growth comes from energy stored in roots and crown
-slow regrowth after grazing

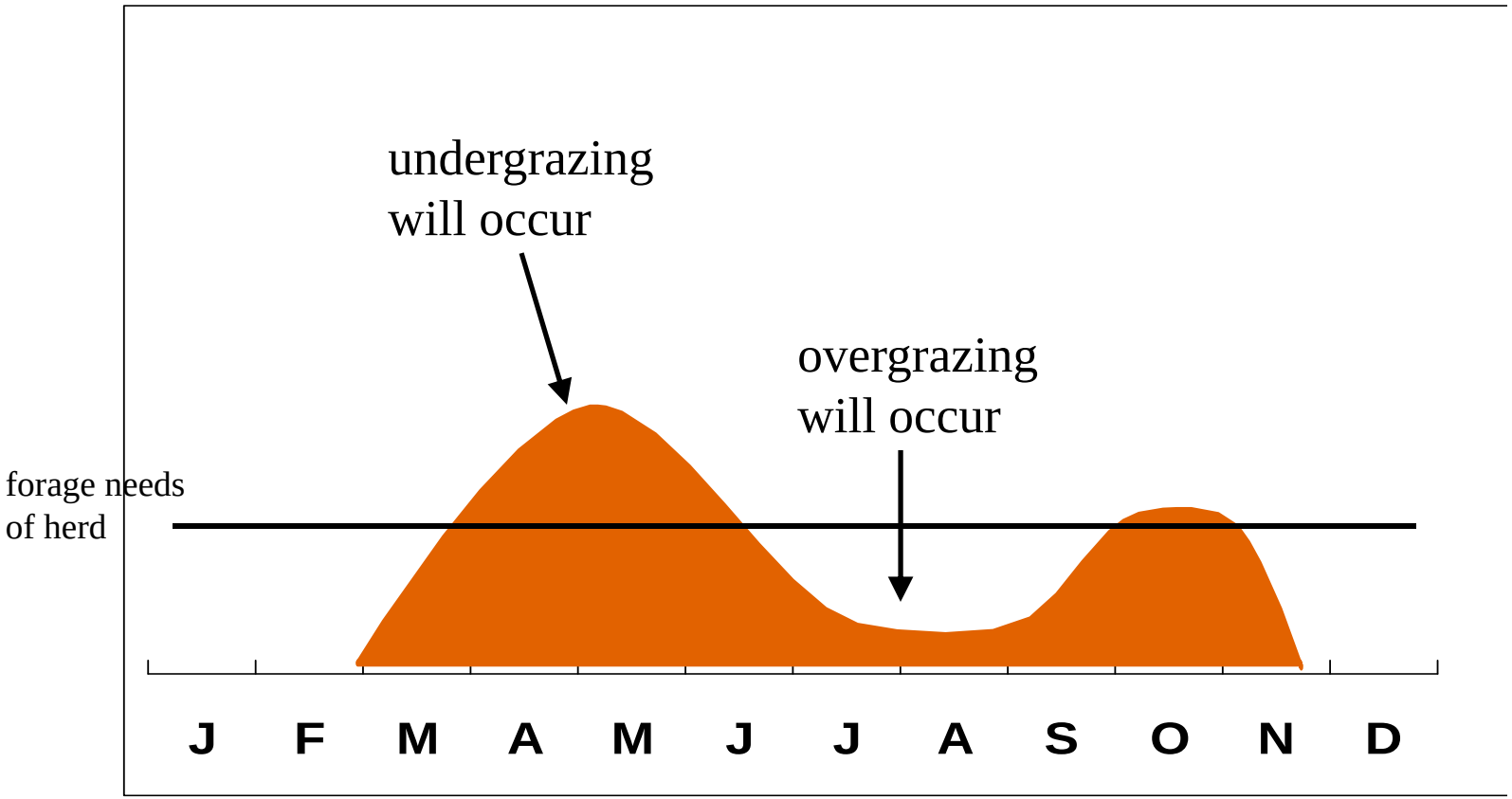
Phase 3

-high leaf area, light interception
-old inefficient leaves
-seedhead or bloom production
-lower photosynthetic rate
-energy used to produce seed
-slow growth rate



overgrazing ⟷ undergrazing

Growth season of tall fescue

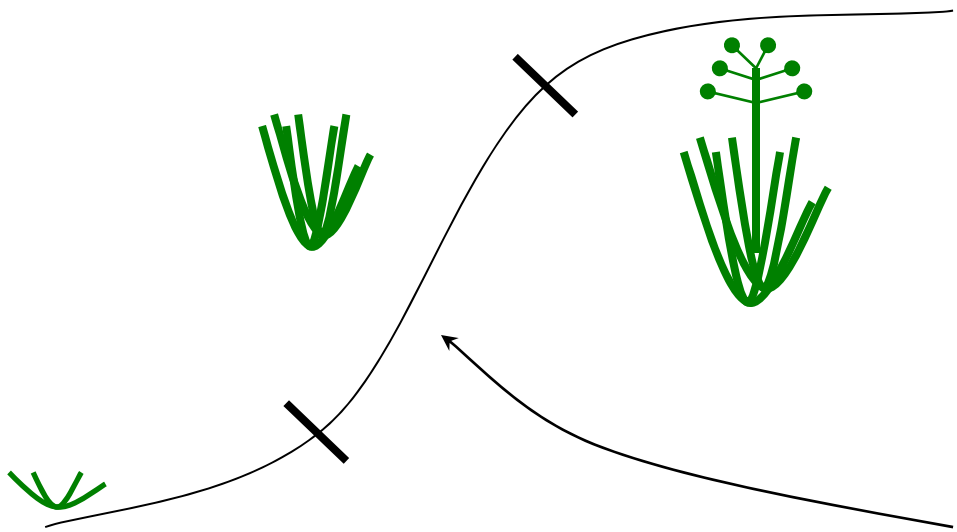


Controlled Grazing

- Many terms mean same thing
  - rotational grazing
  - rotational stocking
  - managed intensive grazing
  - intensive stocking
  - intensive grazing

Controlled Grazing means ...

MANAGING THE FORAGE CURVE



limit overgrazing
and undergrazing

↓

keep plants in steepest
portion of growth
curve

Benefits of controlled grazing

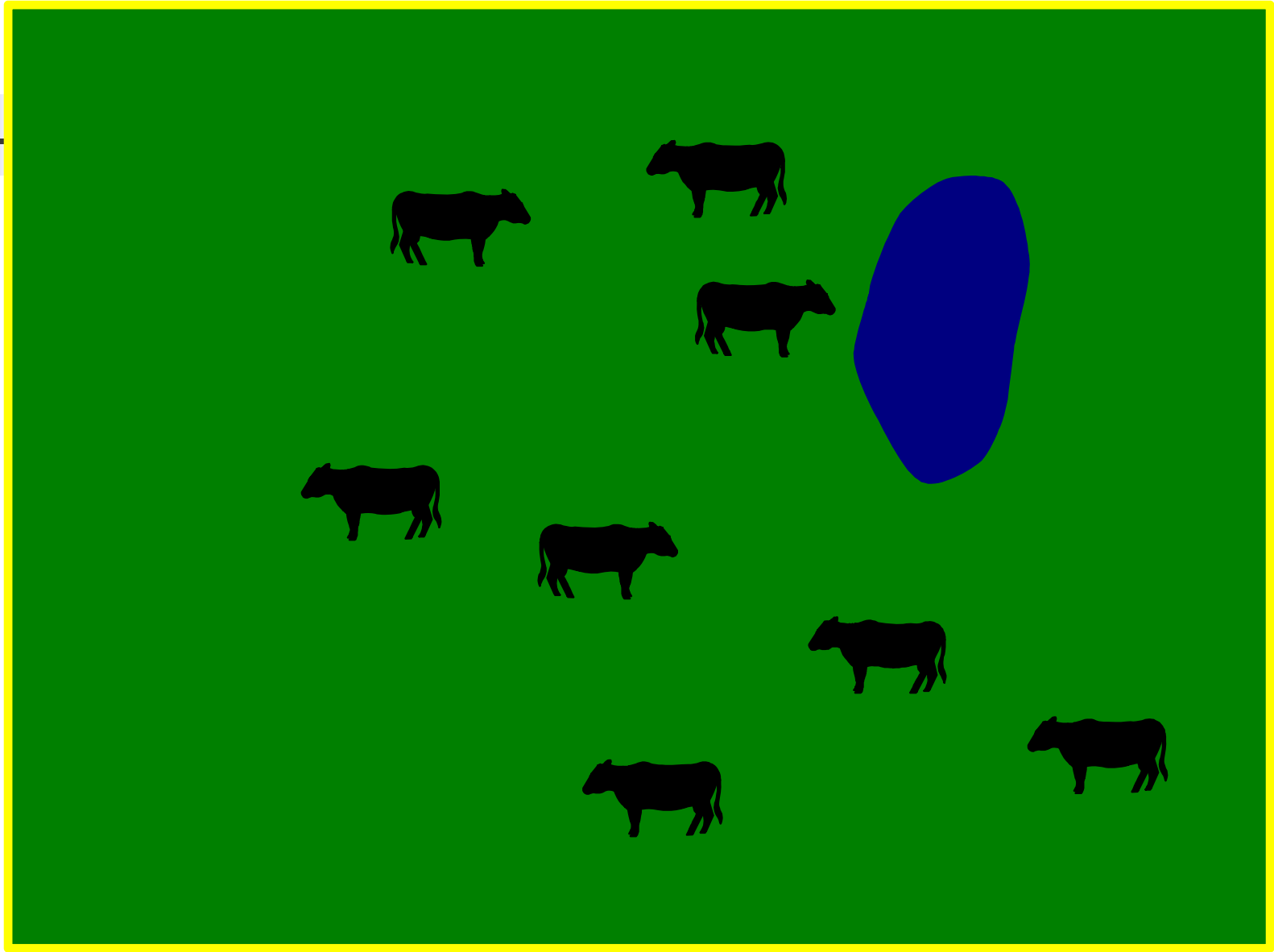
- Improved yield of quality forage
- Improved persistence of forages
- Easier to harvest hay from excess forage
- Improved beef production per acre
- Calmer animals
- Start to notice pastures

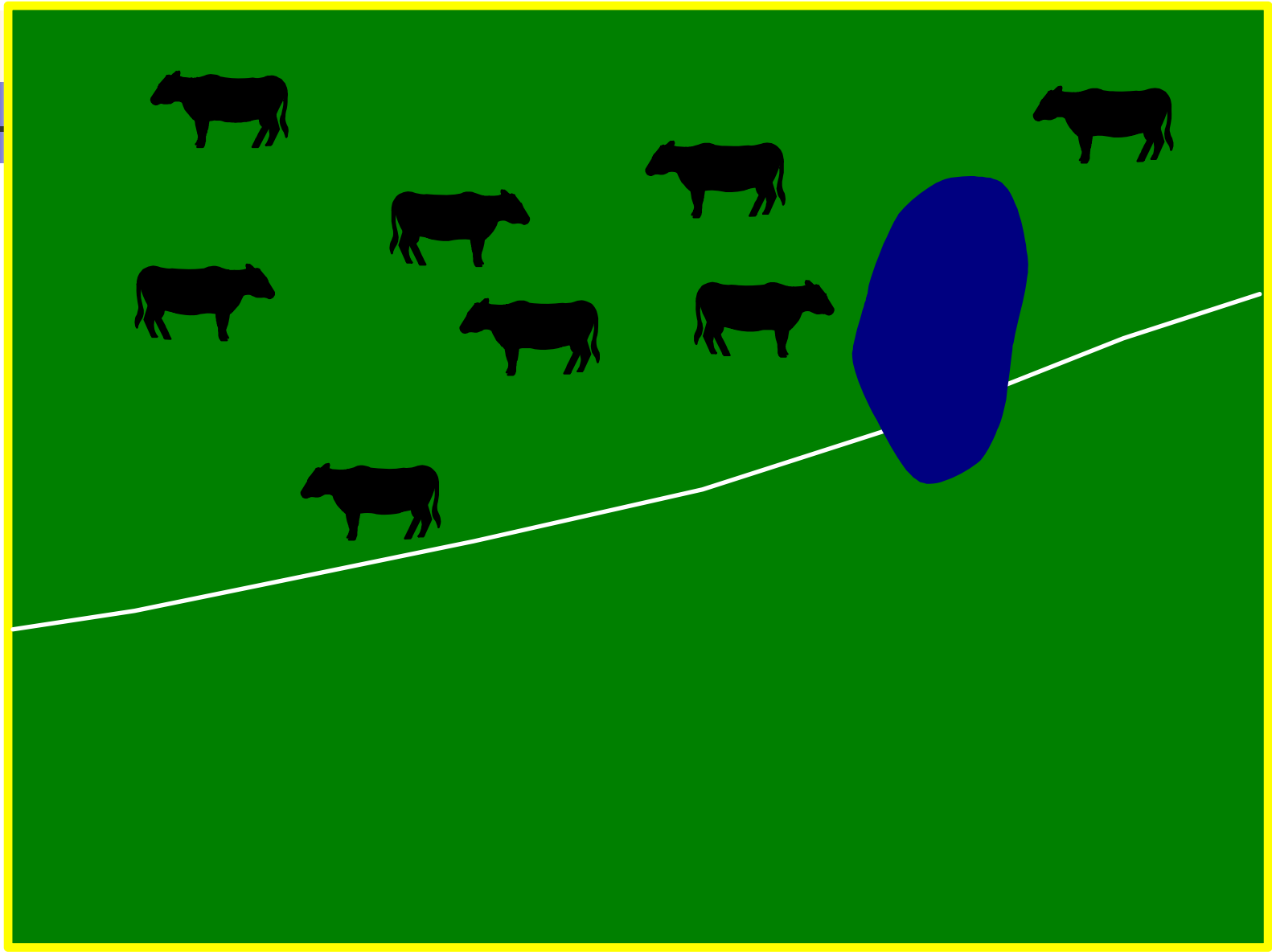
Effect of controlled grazing on animal performance

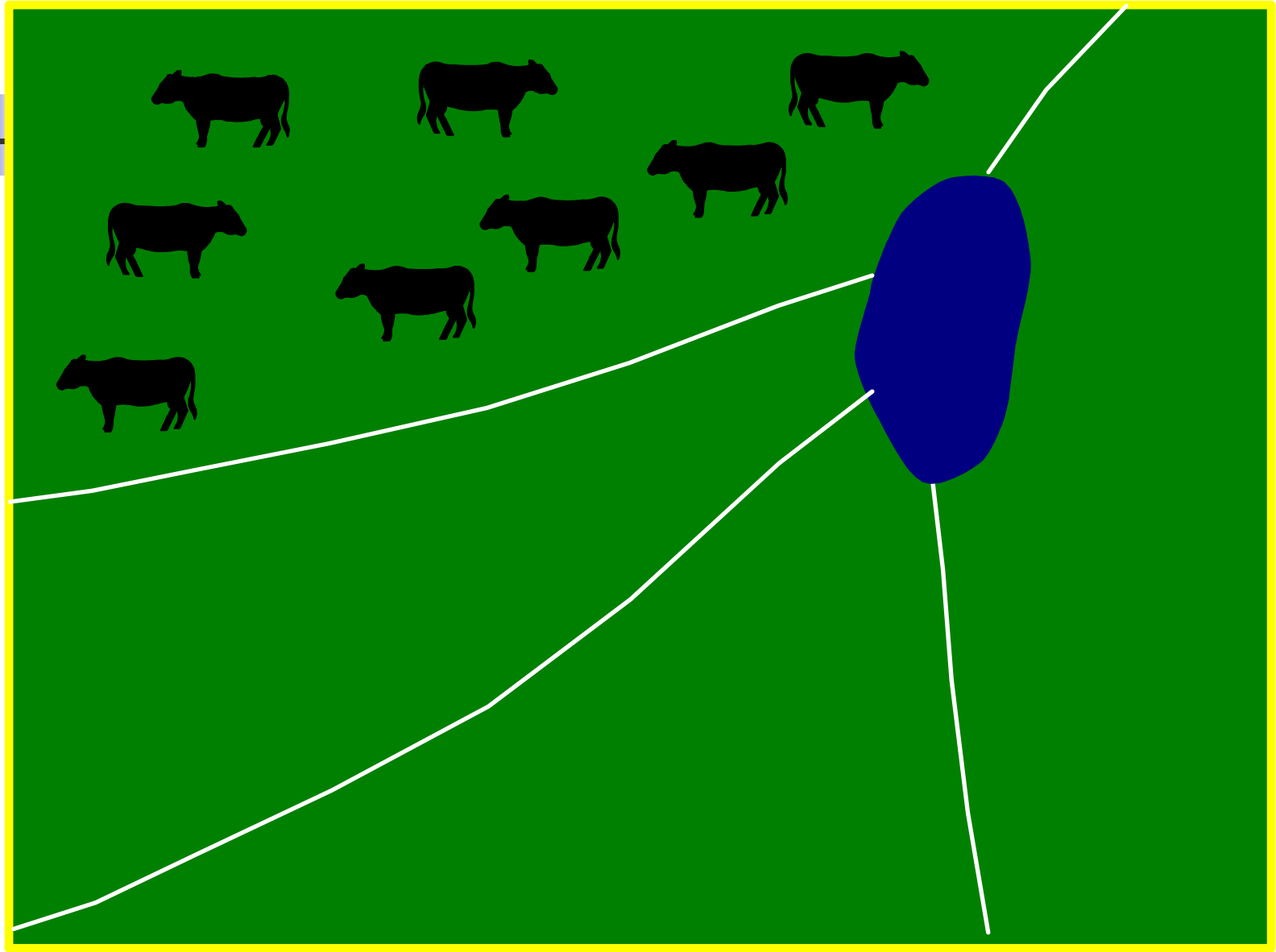
tall fescue/bermudagrass pastures - GA

trait	continuous	controlled
stocking rate (acres/pair)	2.0	1.5
cow pregnancy rate (%)	93	95
calf weaning weight (lb)	490	486
lb calf produced/acre	243	334

Hoveland. 1995. Rotational vs continuous grazing. Proceedings of The Annual Conference of the Tennessee Forage and Grassland Council.







Getting started

- Fences
  - Permanent boundary fences
  - Electric, temporary interior fences
- Water
  - Access to water from each paddock

Fences placed based on …

- Water
- Topography
- Soil type
- Forage species
- other

Paddock size and number

- How often you want to move
  - At least every 5-7 days
- Number and size of animals
- Season

Paddock size

$$\text{Acres required per paddock} = \frac{\text{Avg wt of animals} \times \text{Dry forage consumed (\% of BW)} \times \text{\# of animals} \times \text{days on pasture}}{\text{Dry matter available} \times \text{\% of forage that will be utilized}}$$

Dry forage consumed – usually between 2-3 % of BW

Dry matter available -	alfalfa	225 pounds/inch
	orchardgrass	180 pounds/inch
	wheat	150 pounds/inch
	tall fescue	210 pounds/inch
	bermudagrass	300 pounds/inch

Percent of forage utilized – range between 30 and 70 percent

Example

You have thirty 600 pound steers that you want to graze on a tall fescue pasture that is 12 inches tall. You would like to set paddock size so that they will be moved about every 4 days. How big should each paddock be?

$$\text{Acres required per paddock} = \frac{600 \times 0.03 \times 30 \times 4}{(12 \times 210) \times 0.60} = \frac{2160}{1512}$$

1.4 acres per paddock

Adding a new forage to program

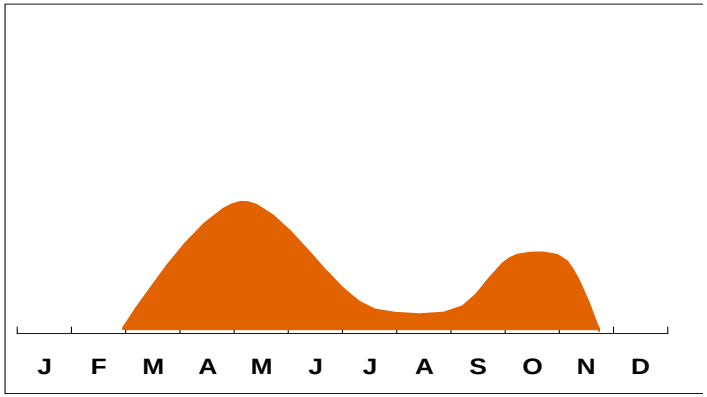
- Goal is to produce forage at near constant rate all year
- Not possible with one forage species

Ky 31 infected tall fescue

- easy to grow
- minimal requirements

Tall fescue is common because

- Easy to establish
- Persistent

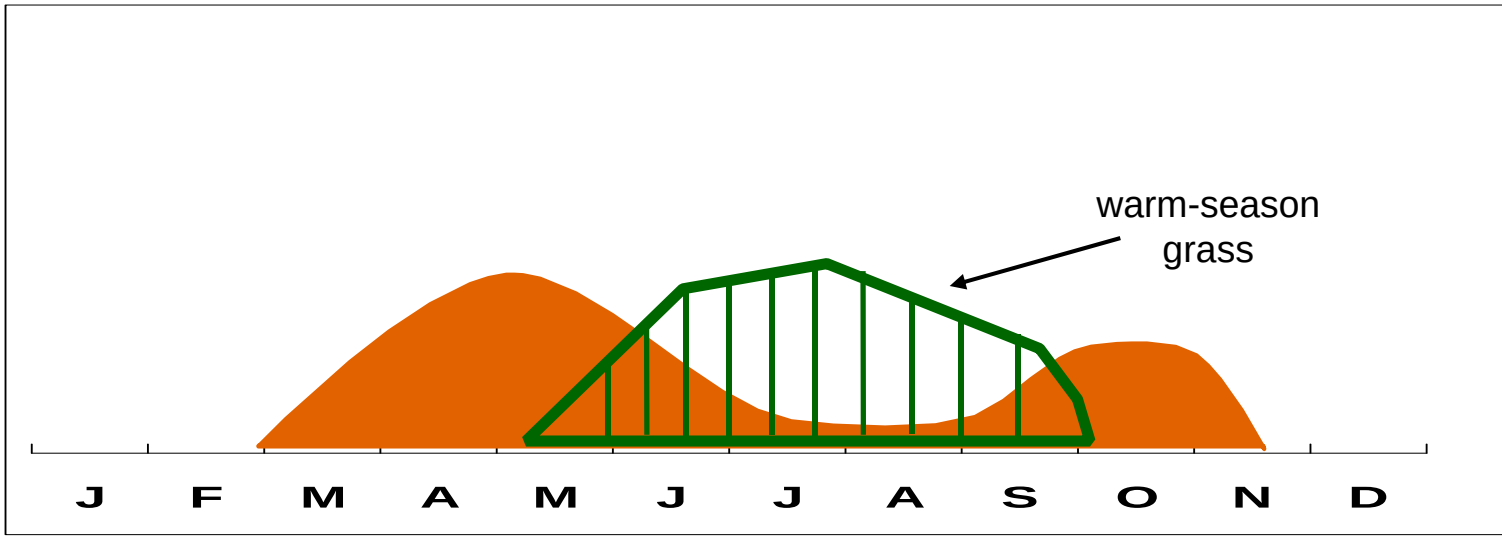


- Long growing season
- Stockpiling

Tall fescue

Problem: Poor summer production

Solution: Add a warm-season grass



Warm-season forage production

1

Take advantage of wild grasses

- johnsongrass
- crabgrass
- dallisgrass
- common bermudagrass

<u>Advantage</u>
- cheap
- leaves fescue

Warm-season forage production

2

Select the proper species

Annual
sudex pearl millet crabgrass

Perennial
bermudagrass native grasses

Annuals vs Perennial

Annuals
- not long term
- expensive
- establishment risk

Perennials
- longer commitment
- less expensive

Warm-season forage production

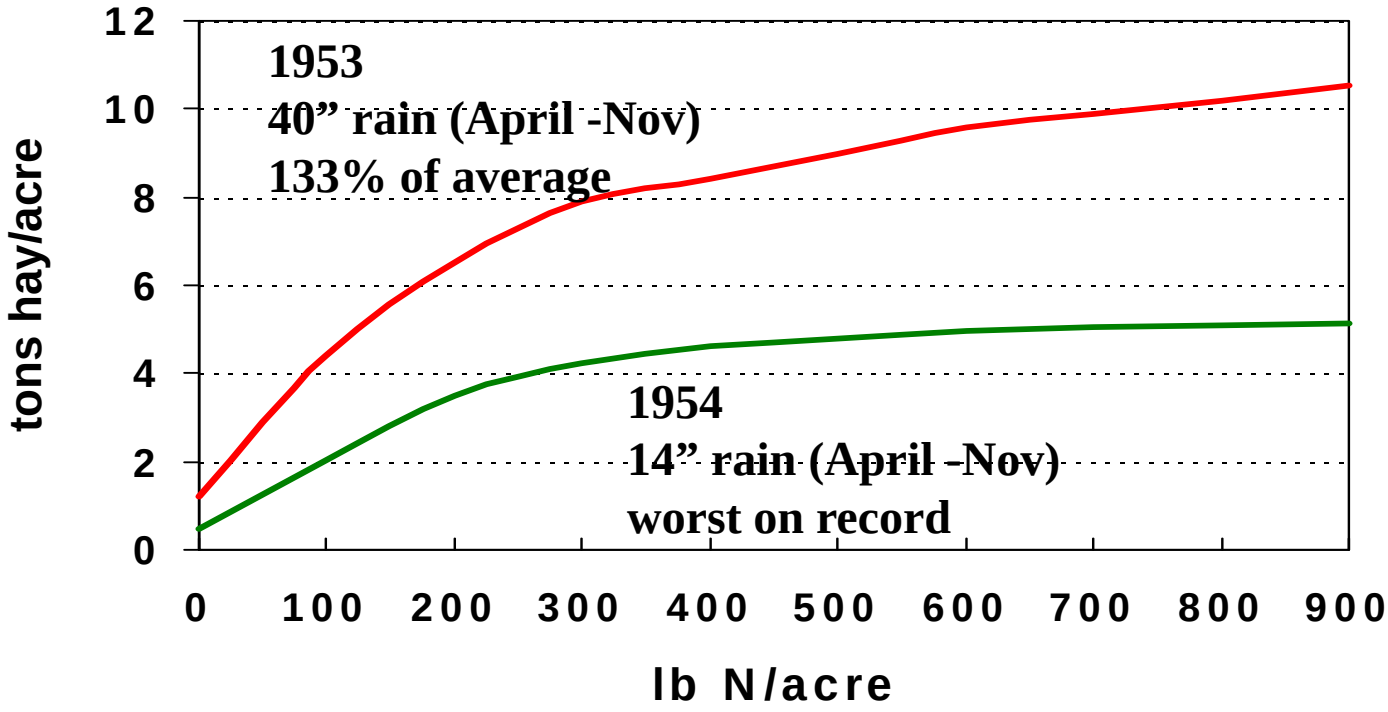
Select the proper site for planting

3

Moisture is key to yield

- deep soils
- bottoms

Yield of Coastal Bermudagrass



Prince and Burton. Agronomy J. 1956. v. 48 p. 296

Warm-season forage production

4. Manage correctly
   - Soil fertility
   - Harvest timing
   - Potential toxicities

Pounds of nutrients removed by crops

	tall fescue 3.5 ton	bermuda 8 ton
nitrogen	135	368
phosphate	65	96
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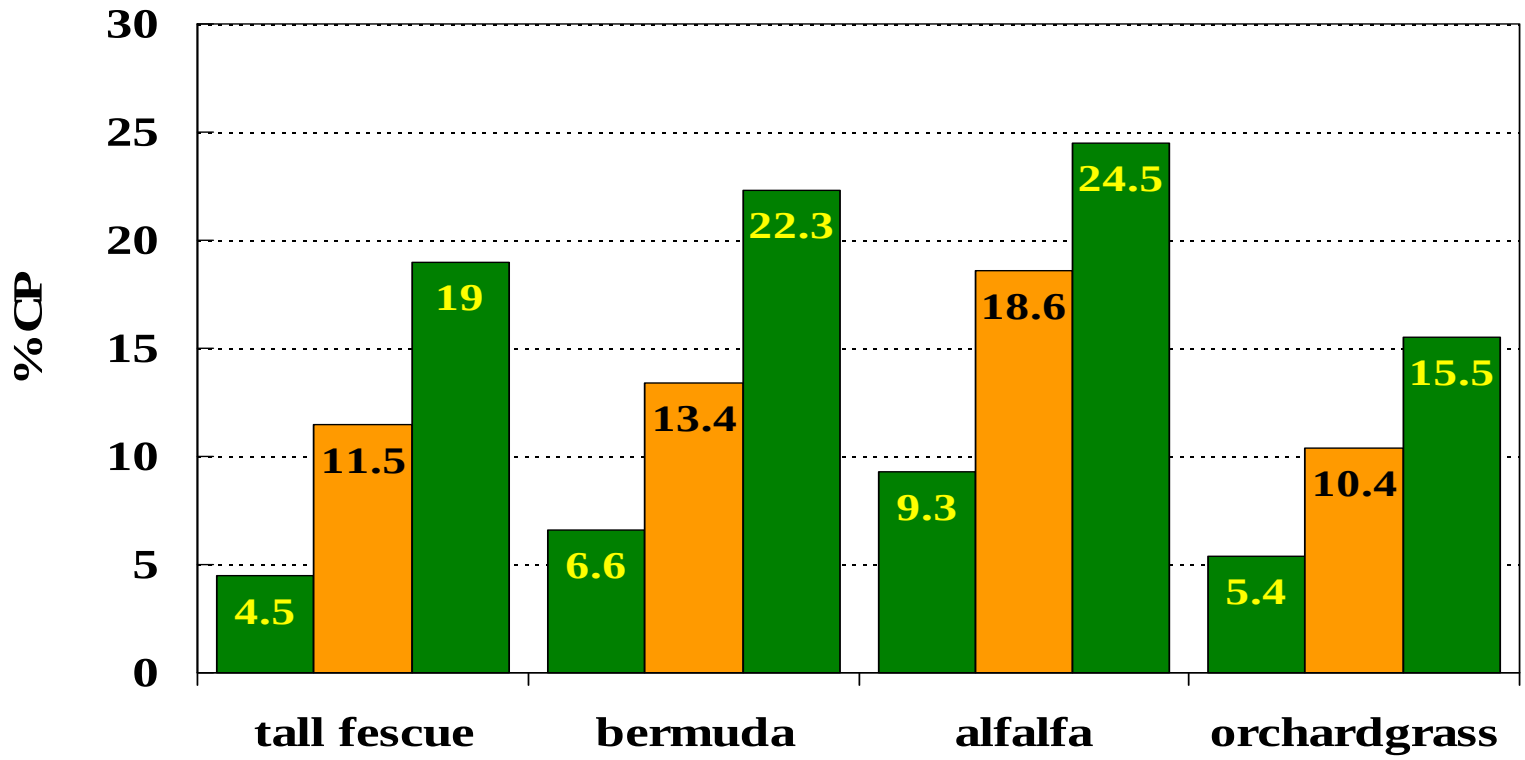
UT Forage Testing Laboratory

crude protein of samples from 2000



Toxicities in Summer Grasses

<u>Nitrates</u>

- drought
- N fertilization
- grazing/hay
- stable in hay

<u>Prussic acid</u>

- sorghums
- frost/stress
- grazing
- not usually in hay

This Master Beef Producer Program is being partially funded by a grant from the Tennessee Department of Agriculture's Development Fund. Proceeds from this fund are derived solely from the sale of the Tennessee "Ag Tag" specialty license plate.