

## How to produce high quality hay I: Forage species, harvest timing and forage quality

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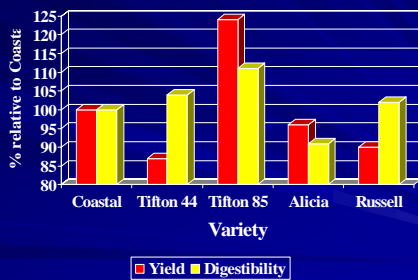
## Potential for Hay Quality

Higher Quality  $\longrightarrow$  Lower Quality

Legumes	Cool Season	Warm Season	Crop Residue
Alfalfa	Tall Fescue	Bermudagrass	Wheat Straw
Clovers	Orchardgrass	Pearl Millet	Cotton Stalks
Soybean	Small Grains	Sorghum-Sudan	Corn Stover

Annuals > Perennials

## Yield and Digestibility of Bermudagrass Hybrids

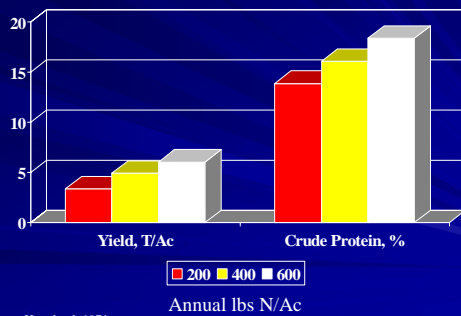


G.W. Burton, unpublished data  
fertility and maturity equal

## Production Inputs and Practices that Affect Hay Quality

- Forage Species and Variety
- Fertility
- Plant Maturity

## Nitrogen Rates Impact Yield and Protein Content of Bermudagrass



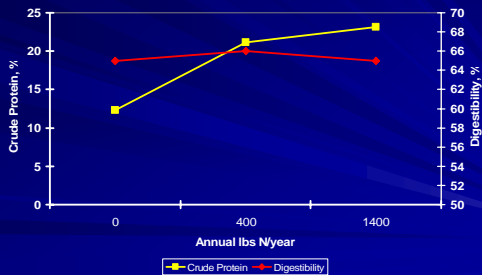
Hoveland, 1971

## Digestibility and Energy Content are Related



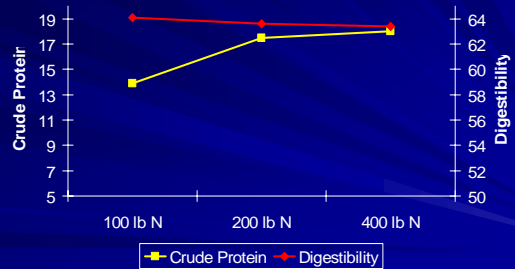
Crude protein is easy to understand but digestibility  
indicates energy content or "calories" of hay

### Effect of Nitrogen Rates on Bermudagrass Crude Protein and Digestibility



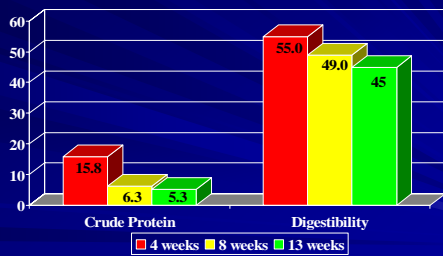
Burton et al.

### Effect of N fertilization on hay quality- Orchardgrass



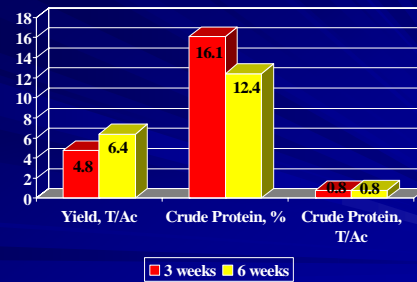
Poulton et al. (1957) All same maturity

### Bermudagrass Harvest Interval: Effects on Protein and Digestibility



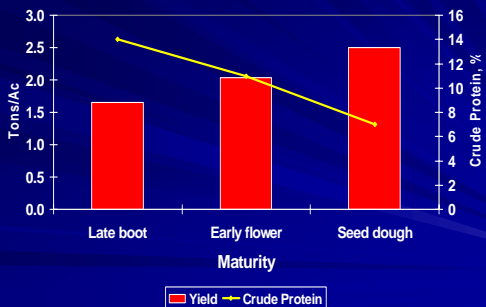
McCullough and Burton, 1962  
DMI 11.9, 8.8, 9.5 lbs  
ADG 1.2, 0.0 lbs

### Bermudagrass Harvest Interval: Effects on Yield and Protein

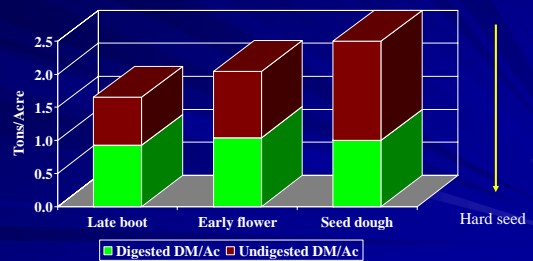


Hoveland et al., 1971

### Fescue Maturity- Effects on Yield and Protein



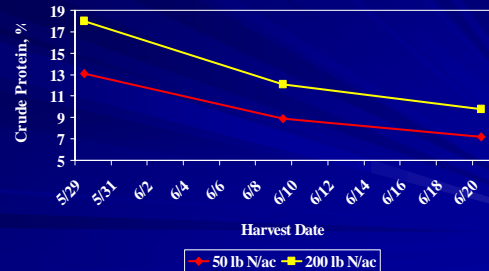
### Fescue Maturity- Digestibility



Majority of hay harvested at hard seed stage  
Only truly applicable with spring harvest

## Which Factor is Most Important?

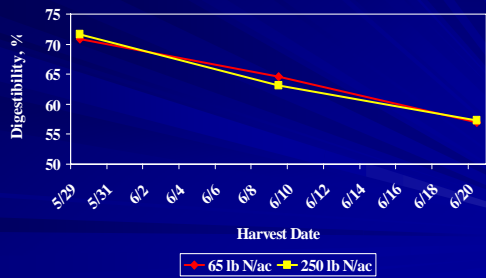
## Does fertility or harvest timing affect *quality* more?- Crude Protein



Bromegrass  
Colovos et al. 1961

(4X as much N)

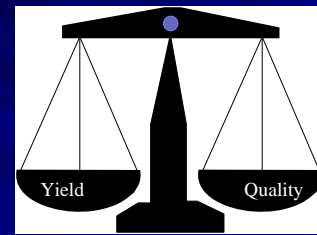
## Does fertility or harvest timing affect *quality* more?- Digestibility



Colovos et al. 1961

(3.8 X as much N)

## The Maturity Balancing Act



## Yield and quality are related, but...

- |  |  |
|--|--|
| <p>■ <b>Yield</b> is influenced by:</p> <ul style="list-style-type: none"> <li>➢ Species/Variety +</li> <li>➢ Fertility +</li> <li>➢ Maturity +</li> </ul> | <p>■ <b>Quality</b> is influenced by:</p> <ul style="list-style-type: none"> <li>➢ Species/Variety +</li> <li>➢ Fertility +</li> <li>➢ Maturity -</li> </ul> |
|--|--|

Forage species and varieties that are adequately fertilized have the *potential* to yield high quality and high yielding hay.

**All** can be lost with improper harvest timing!!!!

Harvesting hay at the proper maturity is the only way to *potentially* bale high quality hay!

Fertilizer drives yield.  
Economics should drive fertilization strategies.

## Harvest Timing Recommendations

- Hybrid Bermudagrass
  - 1st cut at 15-18 inches
  - Subsequent cuttings at 3.5-5 week intervals
- Tall Fescue, small grains, ryegrass, orchardgrass
  - Spring cut at early flower stage
  - Mid to late boot stage for higher quality
  - Affects regrowth potential
  - Subsequent cuttings at 12 inches (better quality)

## Summary

- Choose forage species and variety to match environment and management goals
- Follow soil test fertility recommendations
- Harvest at proper maturity and protect high quality hay
- Store hay properly to protect your investment!