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

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Potential for Hay Quality

Higher Quality | Lower Quality
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Legumes | Cool Season
Alfalfa | Tall Fescue
Clovers | Orchardgrass
Soybean | Small Grains

Perennials | Annuals
Crop Residue | Warm Season
Bermudagrass | Pearl Millet
Cotton Stalks | Sorghum-Sudan
Corn Stover

Annuals > Perennials

Yield and Digestibility of Bermudagrass Hybrids

G.W. Burton, unpublished data

Yield and Digestibility

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

Annual lbs N/Ac

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**

McCollough and Burton., 1962

DMI 11.9, 8.8, 9.5 lbs.
ADG 1.2, .9, 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

Does fertility or harvest timing affect quality more?- Digestibility

Yield and quality are related, but...

- **Yield** is influenced by:
  - Species/Variety +
  - Fertility +
  - Maturity +

- **Quality** is influenced by:
  - Species/Variety +
  - Fertility +
  - Maturity -

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!