Fertilization Fundamentals for Hay Producers

Basics of Soil Fertility for Forages

- Nitrogen
- pH and Liming
- Potassium
- Soil Testing

Hay Production – 2008
Cost Breakdown – C. Lacy

Fertilizer Prices (cents/lb)

The Value of a Ton of Broiler Litter

Assumptions:
Analysis = 3-3-2
2010 Fertilizer Prices = .45-.25-.50
Availability of N-P-K = 60-80-80 %

- 60#N x .45 x .6 = 16.20
- 60#P2O5 x .25 x .8 = 12.00
- 40#K2O x .50 x .8 = 16.00

»Total = $44.20

Other Nutrients?
Organic Matter?
Liming?
Nematode Suppresion?

Dr. Glen Harris, Extension Agronomist-Soil Fertility
Soil Testing is the Key!

Factors Affecting pH:
- Weather (rainfall)
- Soil Type
- Organic Matter
- Tillage & Depth
- Nitrogen Fertilizer
- Lime
- Spatial Variability
- Salt

Why Lime?

Nutrient Availability
Nutrient Unavailability
Provide Ca and Mg
Nitrogen Fixation
Biological Activity

Soil Fertility

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- Lime
- Spatial Variability
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Tons of Calcitic and Dolomitic Lime Sold in Georgia (2001-08)

K is for Persistence!

Deficiency
Weeds
Winterkill
Loss of Stand

N with no K can kill a stand in 2 years!

Dr. Glen Harris, Extension Agronomist-
Soil Fertility
Nitrogen Sources

- Ammonium Nitrate
- Urea
- UAN Solutions
- Ammonium Sulfate
- Anhydrous Ammonia
- Chicken Litter

Nitrogen Cycle:

Urease Inhibitors: Agrotain

Urease Inhibitor + Nitrification Inhibitor:
Agrotain Plus, Agrotain Super U (Nutrisphere-N, Excelis ?)

Fertilizer additive that inhibits degradation of urea by urease (NBPT)

“Agrotain Plus” (for UAN liquids) – also includes a nitrification inhibitor (DCD)

Does not affect microbes (or other soil organisms) directly

Reduces loss of surface applied urea-N to volatilization (up to 14 days under drying conditions) and reduces nitrate leaching

Specially Fertilizer Products through Southern States

Polymer “Nutrisphere” technology

Active Ingredient = “40 % maleic-itaconic co-polymer”

Claims Urease + Nitrification Inhibition

Mode of action = “shields” N from Nickel for urease and from microbes for nitrification (documented ?)

• Agrium Company
• ESN = Environmentally Smart Nitrogen
• Polymer Coated Urea
• Company = Agrium
• “Controlled Release” (not “slow release” ?)
• “Releases as the Soil Warms”
• Slow Release vs. Split Applications

Closed Chambers - Volatilization

Dr. Glen Harris, Extension Agronomist-Soil Fertility

THE UNIVERSITY OF GEORGIA
College of Agricultural & Environmental Sciences
N Volatilization – Cotton, 3 Location Average
Glen Harris – UGA, Tifton

NH₄⁻ mg/L

N Volatilization – Forages, 2 Location Average
Dr. Dennis Hancock – University of Georgia, Athens

NH₄⁻ mg/L

Russell’ Bermuda Grass Yields (lbs DM/a) - 2008
Dr. Dennis Hancock – UGA, Athens