2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

Dr. Miguel Cabrera
Professor - UGA

Benefits and Limitations of Poultry Litter in Grazing Systems

M.Cabrera, V.Calvert, S.Doydora, D.Endale, B.Fairchild, D.Franklin, S.Hassan, CH Huang, D.Kissel, S.Pavlostathis, D.Radcliffe, J.Rema, P.Sun, A.Thompson, and W.Vencill

Topics

- Poultry litter production
- Nitrogen and Phosphorus
- Hormones and antibiotics

Broiler Production in the USA

- EEUU: 9 billion broilers
- Georgia: 1.4 billion broilers

- EEUU: 13 million Mg of poultry litter
- Georgia : 2 million Mg of poultry litter
- 90% applied to grazing systems

Compositionn of poultry litter

	N	P	K	Ca	Mg	S	Cu	Zn
	---------- % ----------						---- mg/kg ---	
Mean	**3.1**	**1.3**	**2.3**	**2.0**	**0.4**	**0.5**	**425**	**315**

Analysis of 3662 samples (AESL, Univ. de Georgia)

N:P = 3:1

Nutrients† in Poultry Litter

N	P	K
---------- Mg ----------		
300.000	190.000	240.000

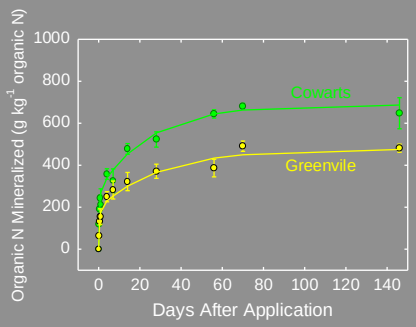
† Nutrients in 13 million Mg of poultry litter (USA)

2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

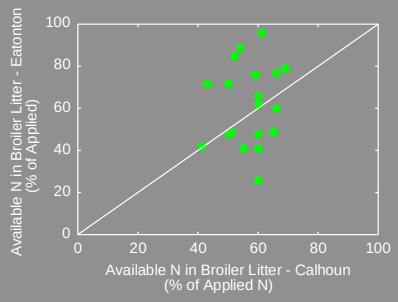
Dr. Miguel Cabrera
Professor - UGA

Available Nitrogen in Poultry Litter



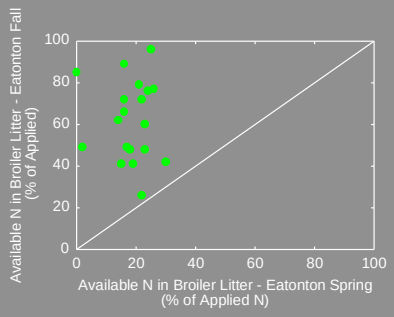
Less available nitrogen in soils with greater clay content

Effect of Physiographic Region on Available N



On average, 50 to 60% of N in poultry litter is available

Effect of Season on Available N



Environmental conditions can affect available nitrogen

N to P Imbalance in Poultry Litter

- Crops need 8 to 6 kg of N for each kg of P
  - N:P = 8:1, 6:1
- Poultry Litter: N:P = 3:1
- Applications that provide adequate N supply more P than required by crops

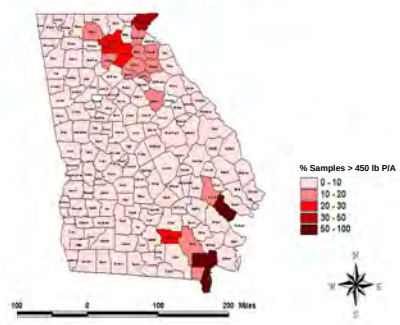
GRASS www.georgiaforages.com | Grazing School | University of Georgia Extension | The University of Georgia College of Agricultural & Environmental Sciences

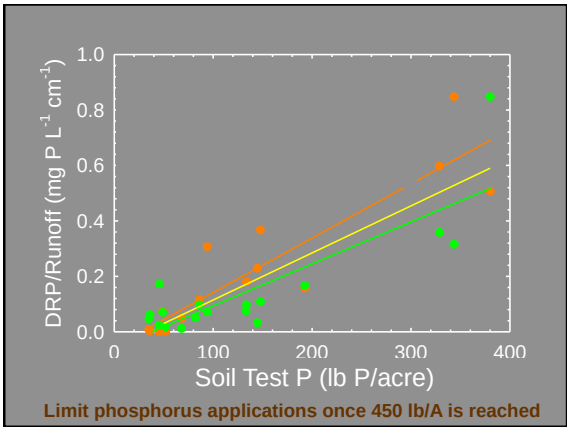
2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

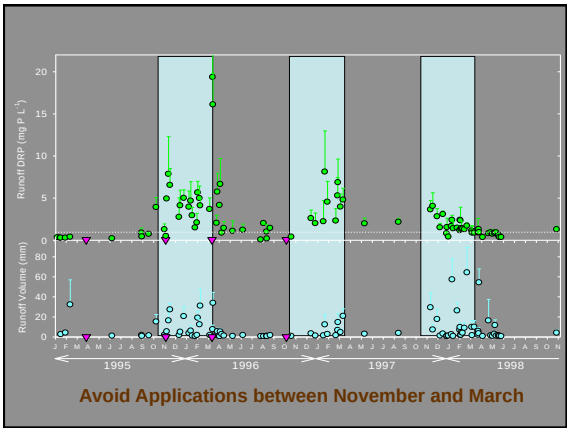
Dr. Miguel Cabrera
Professor - UGA

Phosphorus in Pastures



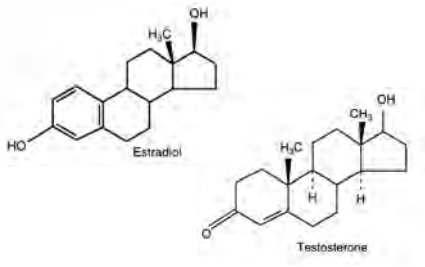


Limit phosphorus applications once 450 lb/A is reached



Avoid Applications between November and March

Hormones in Poultry Litter



- Hormones are excreted naturally, not added to feed

Hormones in Poultry Litter

Animal	Testosterona	Estradiol
	-- µg/kg in dry matter --	
Chicken (male)	133	14
Chicken (female)	133	65

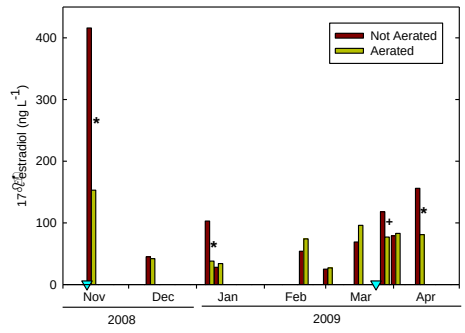
Shore (2009)

GRASS www.georgiaforages.com | Grazing School | University of Georgia Extension | The University of Georgia College of Agricultural & Environmental Sciences

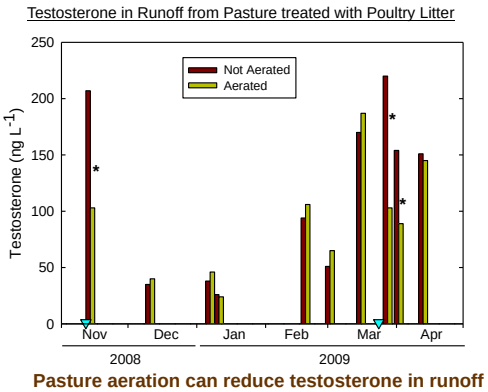
2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

Dr. Miguel Cabrera
Professor - UGA



Pasture aeration can reduce estradiol in runoff



Pasture aeration can reduce testosterone in runoff

House Cleaning


Wordpress.com


Joneshamiltonag.com

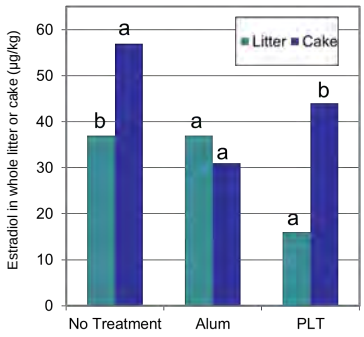

Poultryhub.org

2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

Dr. Miguel Cabrera
Professor - UGA

Concentration of Estradiol in Whole litter and Cake

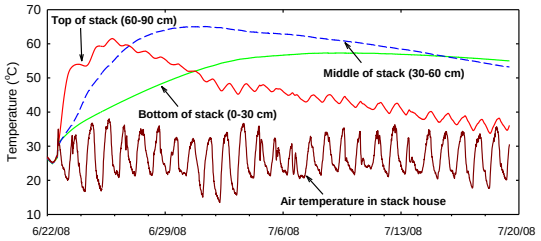


Estradiol concentration is greater in caked litter

Stacking Poultry Litter

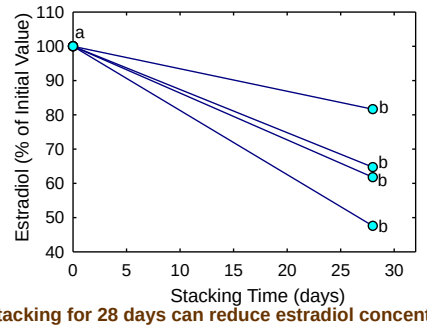
Medición de Temperatura en Pila de Cama de Pollo

Temperature in Stack House



Cabrera et al. (2012)

Effect of Stacking Time on Estradiol

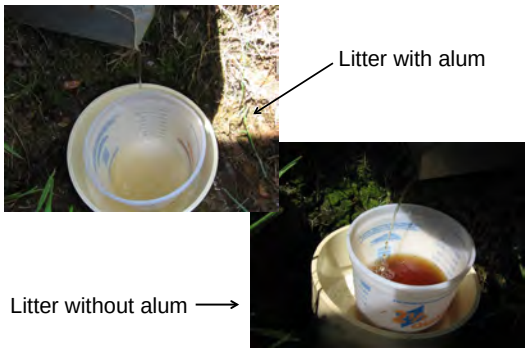


Stacking for 28 days can reduce estradiol concentration

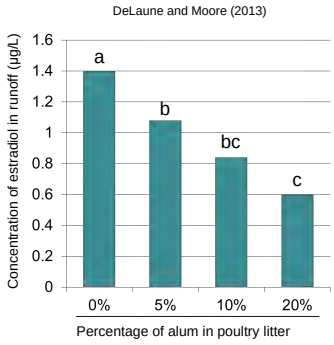
2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

Dr. Miguel Cabrera
Professor - UGA

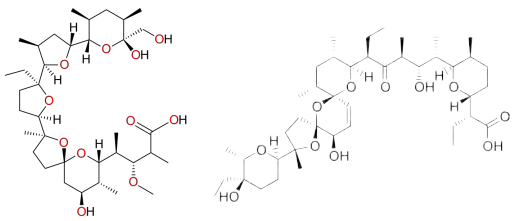


Effect of alum on estradiol in runoff



Alum treatment can reduce estradiol in runoff

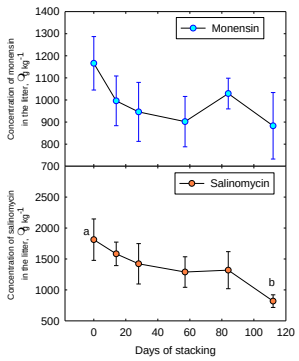
Antiobiotics in Poultry Litter



Monensin

Salinomycin

Effect of Litter Stacking on Antibiotics

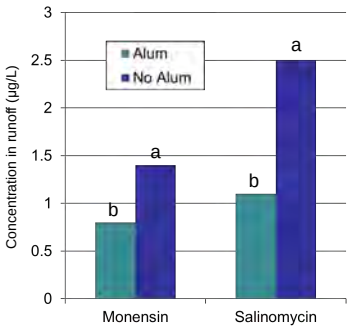


Stacking can reduce antibiotics in litter

2018 Georgia Grazing School:

Benefits and Limitations of Using Poultry Litter in Grazing Systems

Dr. Miguel Cabrera
Professor - UGA



Franklin et al. (2013)

Summary

- Available N in litter varies with soil and environmental conditions **(average 50 to 60%)**
- Applying litter based on N needs leads to build up of **phosphorus** in soil (eutrophication problems)
- Poultry litter contains **hormones and antibiotics** that may affect humans and animals
- **Stacking** litter can reduce hormones and some antibiotics
- Treating litter with **alum before land application** can reduce P, hormones, and antibiotics in runoff
- Pasture **aeration** may reduce runoff and therefore surface water contamination with nutrients, hormones, and antibiotics