5 Basic Keys to a Successful Forage Program

SAVANNAH TANNER
EMANUEL COUNTY EXTENSION

Sheep and Goat Considerations

SHEEP AND GOATS SHOULD HAVE **4 TO 5% OF BODY WEIGHT** IN DRY MATTER (DM) AVAILABLE DAILY. (REQUIREMENTS VARY WITH PRODUCTION STAGE AND SIZE OF ANIMAL; DAIRY GOATS HAVE HIGHER NEEDS.)

DAILY INTAKE IS MOST CRITICAL!

- LOW INTAKES, EXCELLENT RATIONS: AVERAGE PERFORMANCE
- HIGH INTAKES, MODERATE RATIONS: ABOVE EXPECTED PERFORMANCE

Meat Goat Needs

Meat Goat Needs*	Protein (CP)	Energy (TDN)
Bucks (110-220 lb) 2% BW	7%	54%
Dry doe (88 - 154 lb) 2% BW	7%	53%
Late gestation (twins) 2.5% BW	13%	66%
Early lactation (twins) 3% BW	13%	53%
**Growing kid (30 lb; 0.44 lb/day)		
Boer (4.0% BW)	25%	90%
Local (3.6% BW)	21%	89%
Yearlings (66 lb Boer, avg growth, 2.5%BW)	15%	66%

*% BW is all feed/forage eaten on dry matter basis as % of their body weight (NRC, 2007)
**Kids gaining less than 0.44 lb/day would require less; from Dr. Niki Whitley, Fort Valley State University

Sheep Needs

Sheep Needs	Protein (CP)	Energy (TDN)
*Rams (220 lb, maintenance)	7%	53%
*Dry ewe (132 lb)	7%	53%
Late gestation (twins) 2.75% BW	10%	66%
Early lactation (twins) 3% BW	15%	67%
Weanling (4 mon, 66 lb, max ADG)		
Early maturing - 5% BW	12%	79%
Late maturing - 3% BW	19%	66%
*Yearling ewes (88 lb)	8%	66%

*Based on dry matter intake of *around* 2% of body weight, or BW, unless otherwise noted (NRC, 2007); from Dr. Niki Whitley, Fort Valley State University

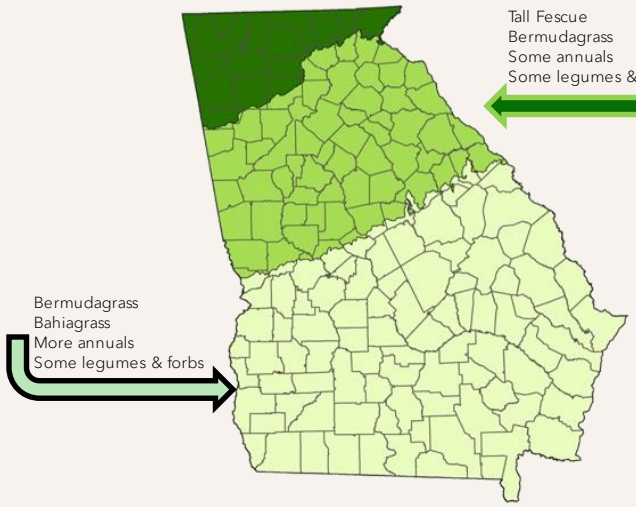
Grazing Behavior

- SHEEP
  - Prefer short, tender vegetation; graze very close
  - Eat a variety of weeds
- GOATS
  - Selective
  - Prefer to graze taller plants and browse (above the shoulder)
  - Intake drops quickly if forage is too short
  - Opportunistic (think of deer)

The 5 Keys

- Species
- Harvesting
- Fertility
- Pest Management
- Quality

1. Species



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Potential Forage Yields in Georgia

Forage Crop	Typical Yield (lbs. DM/acre)
Crabgrass	4,000- 9,000
Corn silage	20,000-32,000
Tropical corn silage	5,000-22,000
Ann. Ryegrass	8,000-14,000
Oats	6,000-11,000
Triticale	3,000-7,000
Bermudagrass, Coastal	12,000-15,000
Bermudagrass, Tifton 85	14,000-22,000
Forage Sorghum	10,000-16,000
Sorghum x Sudangrass	9,000-24,000
Pearl Millet	8,000-13,000

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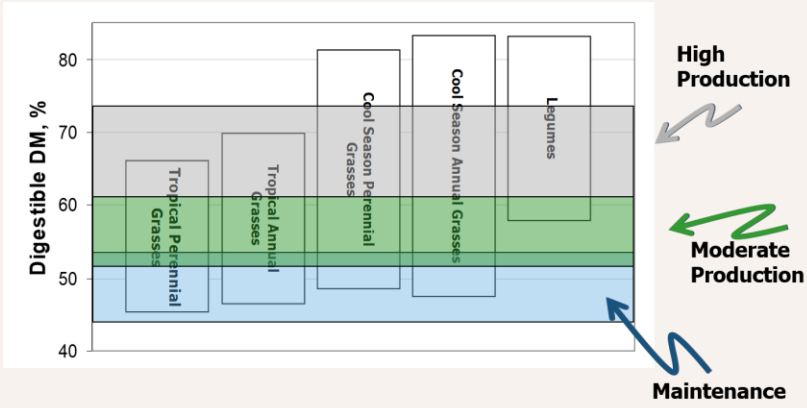
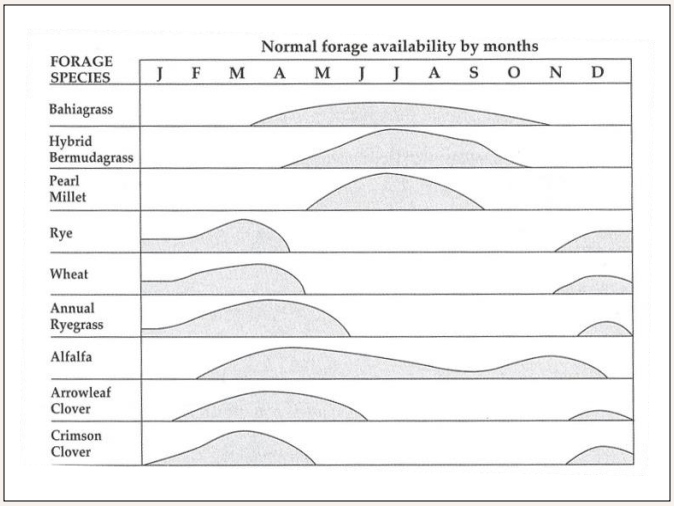


Quality Differences in Forage Species

Forage Productivity Differs Throughout the Year



Bermudagrass

TWO TYPES: SEEDED/ SPRIGGED

USUALLY, VERY DROUGHT TOLERANT

AGGRESSIVE & PERSISTANT

REQUIRES HIGH FERTILITY

NOT TOLERANT OF SHADE OR POORLY-DRAINED SOILS

VARIETIES DIFFER IN

- YIELD
- DIGESTIBILITY
- VIGOR
- REST REQUIREMENTS
- DRYING RATE

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Variety	Overall Rating	Yield*	Digestibility**	Winter Hardiness	Persistence	Leaf Spot Resistance
Alicia (Alecia)	★★½	100	P	G	P	P
Coastal	★★★½	100	F	G	G	E
Coastcross II	★★★★½	135	E	G	ND	ND
Russell	★★★★½	130	G	E	E	G
Tifton 44	★★★★	90	G	E	G	E
Tifton 78	★★★	120	E	F	F	E
Tifton 85	★★★★★	135	E	F	E	E

Varieties- Bermuda

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Bahiagrass

- TOLERATED BROAD PH RANGE (5.5-6.5)
- TOLERATED LOWER FERTILITY
- TOLERATES CLOSER GRAZING
- RESISTANT TO MOST DISEASE AND PESTS
- PREFERS SANDY SOILS
- COMPETITIVE
- PROPAGATED BY SEED

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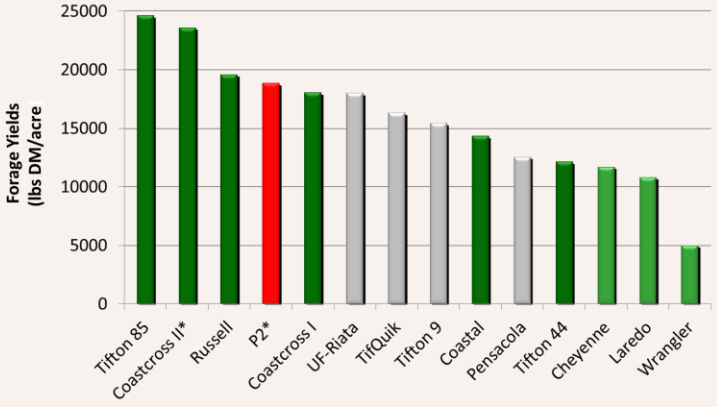

Bermuda/ Bahia Varieties

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Planting Annuals

Rye + Ryegrass Conventionally Drilled: $204/ Acre

Hybrid Bermuda: $463 (does not include herbicide or insecticide application)

Summer Annuals

Warm Season Annuals	
	Sorghum
	Sorghum- Sudan
	Pearl Millet
	Crabgrass

Sorghum / Sorghum-Sudan

- High Yield Potential
- High Quality
- BMR Trait- Less Lignin, More Digestibility
- Harder to manage under grazing
- Graze/cut to 8-12 inches to optimize regrowth
- Possible nitrate accumulation
- Possible prussic acid toxicity
  - DO NOT FEED TO HORSES

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Pearl Millet

- More productive during drought conditions
- Possible nitrate toxicity
- Less palatable than sorghums
- Easier to manage during grazing
- Can be cut as low as 4-6 inches/ animal performance is best at 9-12 inch height

Crabgrass	Reseeds well
	Not drought tolerant
	Very palatable
	Highly digestible
	Highest quality of all summer annuals
	Productive from May- October

Cool Season Annuals	Oats
	Rye
	Ryegrass
	Triticale/ Wheat

Oats	
	NOT COLD TOLERANT
	Requires 6.0 + pH
	Early maturity for grazing
	Later maturity for hay
	If grazed early, later growth is poor.

Rye

- More tolerant to soil acidity than oats or wheat
- Early to very early maturity
- Excellent cold tolerance
- Matures quickly
- Quality declines fast

Annual Ryegrass	
	Tolerates poor drainage
	Tolerates close grazing
	Soil pH requirement around 6.0
	Late maturity
	Good cold tolerance
	Can interfere with bermudagrass emergence

Wheat/ Tritcale

Wheat	Triticale
• Mid-season maturity • Not tolerant of soil acidity • Good cold tolerance	• Wheat/ Rye Hybrid • Matures late • Yields aren't great • Quality declines quickly

Legumes & Brassicas

- Annual Clover
- Perennial Clover
- Alfalfa
- Brassicas

Annual Clover

- Crimson Clover is most common
- Has higher crude protein than grass species
- High quality
- Fixates nitrogen
- Can add up to about $50 value to nitrogen in your forages
- Some varieties can reseed but typically last only a year or so.

Perennial Clover

- Red & White Clovers are most common
- Excellent for overseeding
- Can add a value of up to $100 of nitrogen to your forages
- Has higher protein than other forages

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Alfalfa	
	Requires well-drained soil
	Can last up to 7 years. Usually around 5
	Requires soil pH of 6.5+
	Has high bloat potential
	Can be used for hay, grazing, or silage
	Highest quality forage in Georgia

Brassicas

Turnips, Rape, Kale, Radish
Fast establishing
Winter hardy
Ready to graze in 60-120 days
Very high quality
Aggressive growth
Can help with compacted lands
Naturally, pest resistant
Can have adverse effects on some livestock (cattle)
Don't overseed
Requires pH of 5.5-6.8 and well-drained soils

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Sericea Lespedeza

- VARIETY: AU GRAZER
- DROUGHT RESISTANT
- POTENTIAL DEWORMING EFFECT DUE TO TANNINS
- GROWS ERECT 2-4 FT TALL
- BEGIN GRAZING AT 8-15 INCHES TALL; DO NOT GRAZE BELOW 4 INCHES

2. Harvesting

Grazing

Hay

Baleage

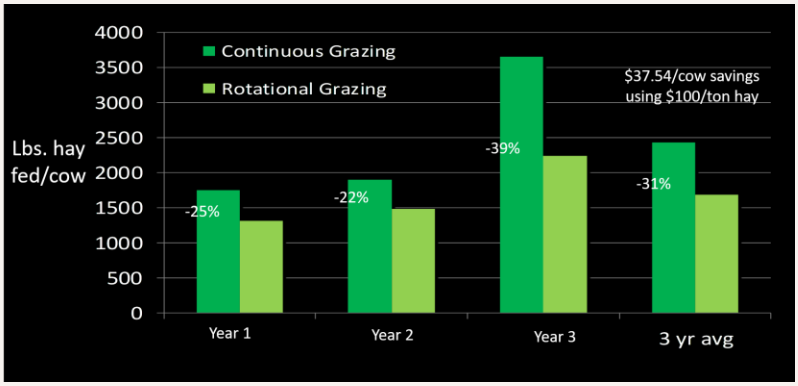
Grazing Tips

Grazing Types

Available Forage	Continuous Stocking	Moderate Rotational Stocking	Strip Grazing
(dry lbs/acre)	---------- (cow-days/acre) ----------		
1500	19-25	31-38	41-47
2000	25-33	42-50	54-63
2500	31-42	52-63	68-78

Grazing Efficiency

System/Method	Efficiency
Grazing	
Continuous Stocking	30-40%
Slow Rotation (3-4 paddocks)	50-60%
Moderate Rotation (6-8 paddocks)	60-70%
Strip Grazing, Daily Rotation	70-80%



Grazing Effect on Hay Needs

Hay

- Losses
- Harvest Timing
- Cutting Height
- Rain Risks
- Moisture at Baling
- Storage

Harvesting
3-15%

Field Curing
3-25%

Storage
20-45%

Feeding
10-30%

Losses accumulate with each step

Harvest Timing

- **Hybrid Bermudagrass**
  - 1st cut at 12-16 inches, Subsequent cuttings at 3.5-5-week intervals
- **Tall fescue, ryegrass, orchardgrass, etc.**
  - Spring cut at early flower stage
  - Mid to late boot stage for higher quality, Subsequent cuttings at 10-12 inches (better quality)
- **Sudangrass, hybrids, pearl millet**
  - 30 to 40 inches
- **Alfalfa**
  - Spring cut at when 10-20% of plants are blooming
  - Cut at late bud – 10% bloom stage

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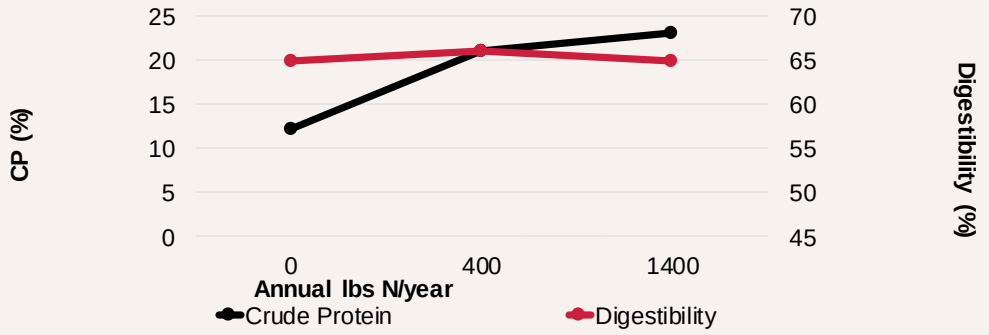
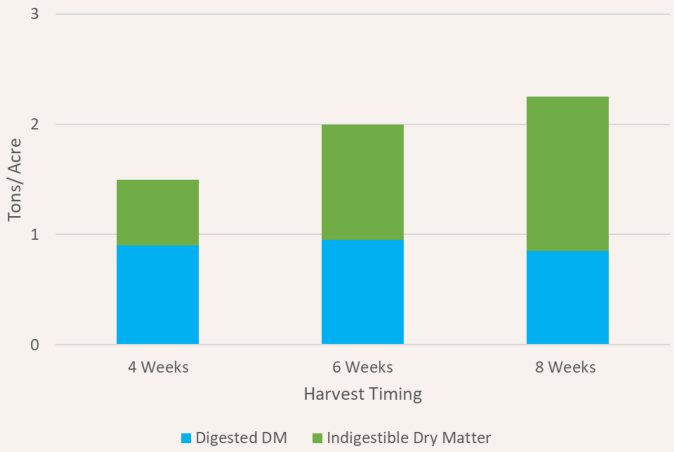
What affects forage quality more? Harvest timing or fertilization?

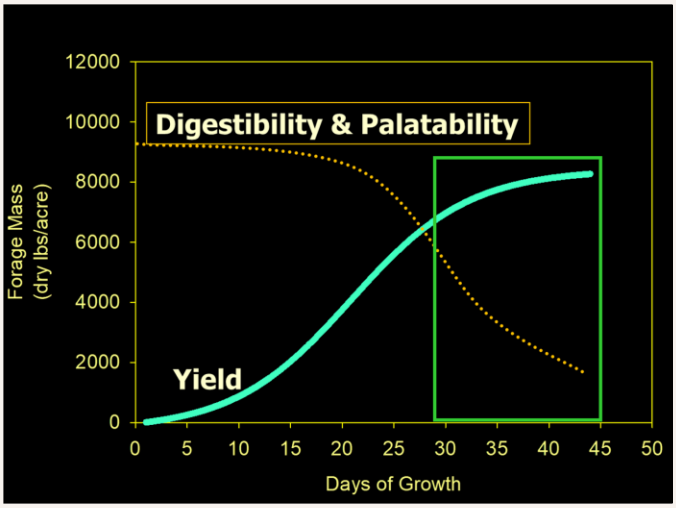
- CP increases with fertilization, but digestibility remains unchanged.
- How much of the protein is nitrates?





Bermudagrass Maturity- Digestibility

Plant Maturity



Grass Grows Grass

Cutting Height Matters

Cutting/ Grazing Height

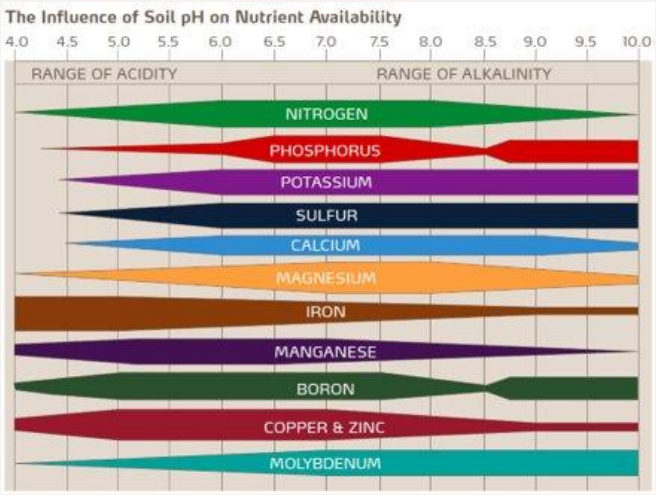
Species	Height in Inches
Alfalfa	2
Bahiagrass	2
Millet	8-10
Sorghum/ Sorghum-Sudan	6-9
Tall Fescue	3
Bermuda	3

3. Fertility

- Soil TEST!!!!!!!!!
- Soil pH
- Nitrogen
- Potassium
- Economics

Soil pH

- pH is a 0-14 Scale- 7 = neutral, <7 = acidic, >7 = alkaline
- GA soil pH averages 4.5 – 5.5 (Most forages perform best at pH 5.8 – 6.5)
- Soil pH = "The Master Variable" for nutrient uptake and availability



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Nitrogen

Stimulates plant growth and increases crude protein

For hay: 75-100 lbs before rapid growth in the spring and similar units after each cutting.

For grazing: Moderate stocking- 50-75 lbs. N and 60-80 lbs. N for heavily stocked pastures

Do not graze or cut after nitrogen application for a minimum of 7 days after a drought ending rain (0.5 inches).

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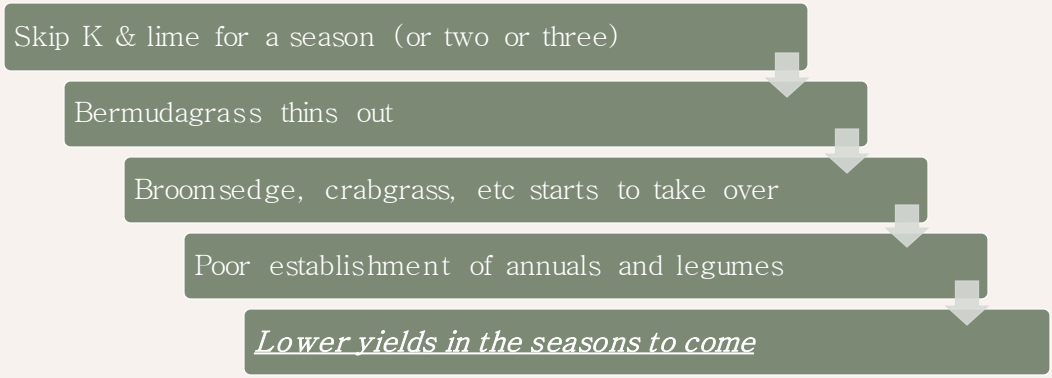
Potassium

Essential for high yields and healthy and persistant stands.

40-50% of recommendation in spring and 50-60% in Mid-Late season

Fertilizer is expensive.

Low fertility in the summer can cause bigger problems later.



Unseen cost of not applying lime

	Amt. Used Annually	Unit Price	Decrease in Efficiency	Value of Decrease
	(Lbs./acre)	($/lb.)		($/acre)
N	200	$0.60	35%	-$42
P_2O_5	50	$0.55	50%	-$14
K_2O	150	$0.40	10%	-$6
			Total	-$62

The difference of a soil pH of 5.6 vs. 6.2.
-Dr. Baxter

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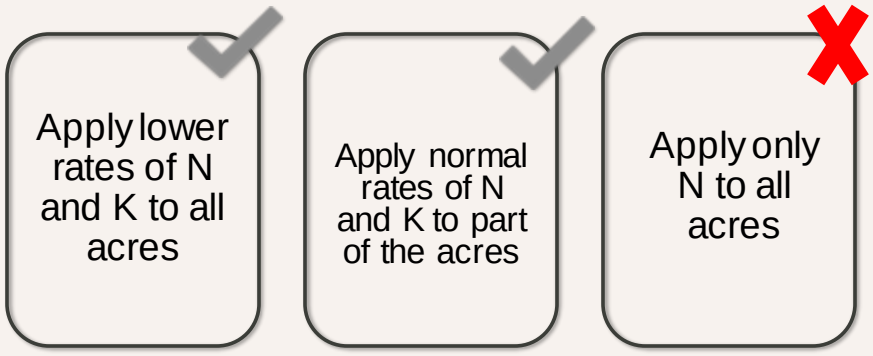
What if I can't afford to fertilize at a full rate?

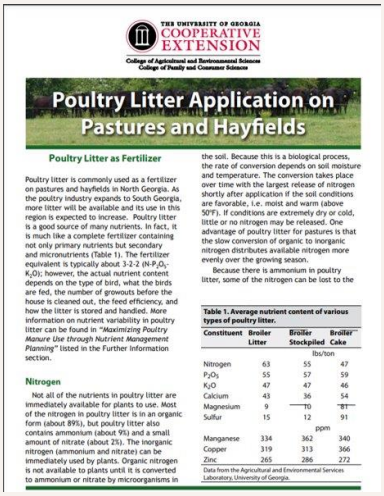


Split K Applications

- APPLY 40-50% IN LATE SPRING AND THE OTHER 50-60% IN MID-LATE SEASON
- 200 LBS. RATE FOR 3-4 YEARS = $200-$300 PER DR. HANCOCK
  - 2022 Price of $800/ ton = $320 for 4 years.
- RE-SPRIGGING A FIELD WILL COST AT LEAST $400/A + 6-12 MONTHS LOST PRODUCTION IF YOU CAN FIND A SPRIGGER..

Should I use broiler litter?

- GET THE LITTER TESTED BEFORE IT IS APPLIED
- **NITROGEN**: ONLY ~50% IS AVAILABLE DURING THE GROWING SEASON WHEN IT IS APPLIED (VERY LITTLE CARRYOVER)
- **PHOSPHORUS**: MOST WILL BE AVAILABLE DURING GROWING SEASON WHEN IT IS APPLIED
- **POTASSIUM**: MOST WILL BE AVAILABLE DURING GROWING SEASON WHEN IT IS APPLIED



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College of Agricultural and Environmental Sciences
College of Family and Consumer Sciences

Poultry Litter Application on Pastures and Hayfields

Poultry Litter as Fertilizer

Poultry litter is commonly used as a fertilizer on pastures and hayfields in North Georgia. As the poultry industry expands to South Georgia, more litter will be available and its use in this region is expected to increase. Poultry litter is a good source of many nutrients. In fact, it is much like a complete fertilizer containing not only primary nutrients but secondary and micronutrients (Table 1). The fertilizer equivalent is typically about 3-2-2 (N-P_2O_5-K_2O); however, the actual nutrient content depends on the type of bird, what the birds are fed, the number of growouts before the house is cleaned out, the feed efficiency, and how the litter is stored and handled. More information on nutrient variability in poultry litter can be found in *"Maximizing Poultry Manure Use through Nutrient Management Planning"* listed in the Further Information section.

Nitrogen

Not all of the nutrients in poultry litter are immediately available for plants to use. Most of the nitrogen in poultry litter is in an organic form (about 89%), but poultry litter also contains ammonium (about 9%) and a small amount of nitrate (about 2%). The inorganic nitrogen (ammonium and nitrate) can be immediately used by plants. Organic nitrogen is not available to plants until it is converted to ammonium or nitrate by microorganisms in the soil. Because this is a biological process, the rate of conversion depends on soil moisture and temperature. The conversion takes place over time with the largest release of nitrogen shortly after application if the soil conditions are favorable, i.e. moist and warm (above 50°F). If conditions are extremely dry or cold, little or no nitrogen may be released. One advantage of poultry litter for pastures is that the slow conversion of organic to inorganic nitrogen distributes available nitrogen more evenly over the growing season.

Because there is ammonium in poultry litter, some of the nitrogen can be lost to the

Table 1. Average nutrient content of various types of poultry litter.

Constituent	Broiler Litter	Broiler Stockpiled	Broiler Cake
	lbs/ton		
Nitrogen	63	55	47
P_2O_5	55	57	59
K_2O	47	47	46
Calcium	43	36	54
Magnesium	9	10	81
Sulfur	15	12	91
	ppm		
Manganese	334	362	340
Copper	319	313	366
Zinc	265	286	272

Data from the Agricultural and Environmental Services Laboratory, University of Georgia.

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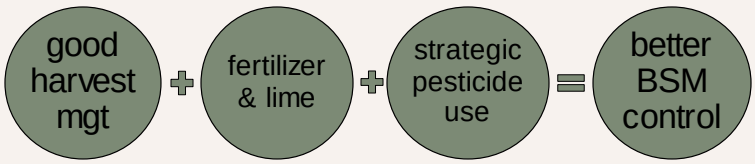
4. Pest Management

- Stem Maggots
- Armyworms
- Weeds
- Applications

Stem Maggots

More competitive the forage = less impact from BSM



~$13,000 seasonal ***net loss*** for a 100-ac hay producer despite 15-20% yield increase in finer varieties during peak season	If left entirely unsprayed, the same producer would have still generated ~$4,000 in ***profit***

BSM may cause yield and economic losses, but unnecessary insecticide applications are more costly! How do those applications affect resistance in armyworms?

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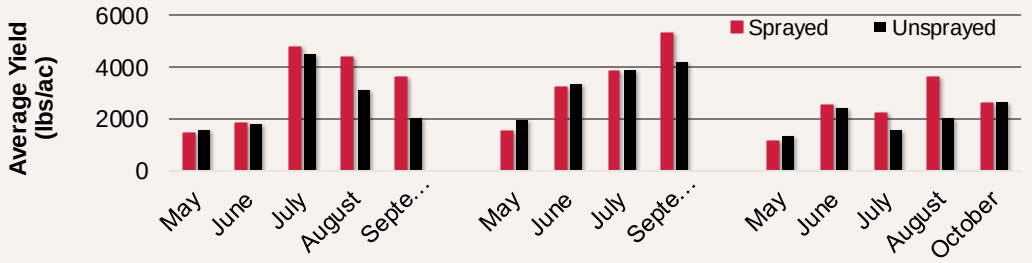
Stem Maggots do not require insecticides at every harvest.



BSM damage is most severe in late July to mid-September!

Variety matters on BSM

Armyworms	Scout: 3 worms/ sq ft.
	Cut followed by insecticide
	Armyworms prefer high quality forages
	Damage may appear as thinned out grass and brown spots

Armyworms

Chemical	Example Trade Name	Grazing Interval (d)	Harvest Interval (d)	Residual Activity
Carbaryl	Sevin SL	14	14	medium
Methomyl	Lannate 2.4 LV	7	3	low
Cyfluthrin	Tombstone	0	0	low
Beta-cyfluthrin	Baythroid XL	0	0	low
Lambda-cyhalothrin	Warrior II w/Zeon	0	7	low
Zeta-cypermethrin	Mustang Maxx	0	0	low
Diflubenzuron	Dimilin 2L	---	1	medium
Methoxyfenozide	Intrepid 2F	0	7	medium
Spinosad	Blackhawk	0	3	low
Chlorantraniliprole	Prevathon	0	0	high
Chlorantraniliprole + Lambda-cyhalothrin	Besiege	0	7	high

Low = 0-7 d

Medium = 7-21 d

Large = 21-28 d

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How often are we spraying pyrethroids for stem maggots? Are they really worth spraying?

Are we using any residual products (I.e. dimilin)?

Are we getting the product where it needs to be in the lower part of the canopy?

Are we putting out enough water?

Weed Considerations

- Can the weed be problematic to my livestock?
- Is the weed there because of my fertility program?
- How easily is the weed controlled by herbicides?
- Can I hold off until the end of the year?

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Weed Control- PREs are more cost effective than your think.

Does not include application costs (assume $12-15/ac)

Prowl H2O = 2-4 applications

Rezilon = 1-2 applications

Herbicide options	Cost/ac
Prowl H2O (4.1 qts/ac/yr)	$76
Rezilon (3 oz/ac for crabgrass; 6 total)	$30-60

Weed Control- Posts can add up!

Does not include application costs (assume $12-15/ac)

Mowing would use even more fuel than spraying!

Herbicide options	Cost/ac
Pastora (1.25 oz/ac)	$25
2,4 – D (up to 1 gallon/yr)	$18
GrazonNext (20 oz/ac/yr)	$14

Improper use of herbicides = loss of money

- Builds resistance
- Off-target movement
- Injured or killed plants
- Loss of chemicals
- Reduction of efficacy
- Lawsuits?
- Yield Loss

Light Bar & GPS Guidance

Less overlap = fewer passes

Less time and reduced fuel consumption

Added benefit when combined with section control

Percent Overlapped	Hayfield	Pasture
10% Overlap	$771	$574
5% Overlap	$736	$548
1% Overlap	$708	$527
Standard Application Cost	$701	$522

How do I save money on chemical applications?

10% overlap > increases input costs by ~$50-70/ac

Acres	Increase in input costs
50 acres of pasture	$2,600
25 acre of hayfield	$1,400
Total input "loss"	$4,000

Can I afford a light bar?

A light bar costs $1000–$2000
–Dr. Simer Virk

5. Quality

Keys to a successful forage program

- Selecting the right species.
- Utilizing harvesting methods and timing to create efficient and quality forages
- Keeping up with soil fertility- SOIL TEST!!!!
- Utilizing adequate pest management.
- QUALITY IS THE MOST IMPORTANT FACTOR- HAY TEST!!!!

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YOU are the most important asset to your farm.
This is a really stressful time — how are you doing?
Take a moment to check in with yourself:
Are you sleeping and eating? How are you feeling health-wise?
Are you taking any kind of a break from work — even a few minutes?
Who are you talking with about your stress? Who could you talk with?
Need to talk to someone?
Call the Georgia Crisis and Access Line
1-800-715-4225
for immediate access to routine or crisis services 24/7 every day of the year.
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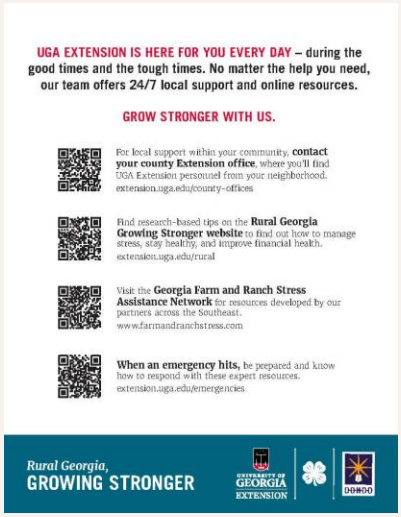
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GROW STRONGER WITH US.
For local support within your community, contact your county Extension office, where you'll find UGA Extension personnel from your neighborhood.
extension.uga.edu/county-offices
Find research-based tips on the Rural Georgia Growing Stronger website to find out how to manage stress, stay healthy, and improve financial health.
extension.uga.edu/rural
Visit the Georgia Farm and Ranch Stress Assistance Network for resources developed by our partners across the Southeast.
www.farmandranchstress.com
When an emergency hits, be prepared and know how to respond with these expert resources.
extension.uga.edu/emergencies
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Questions?

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