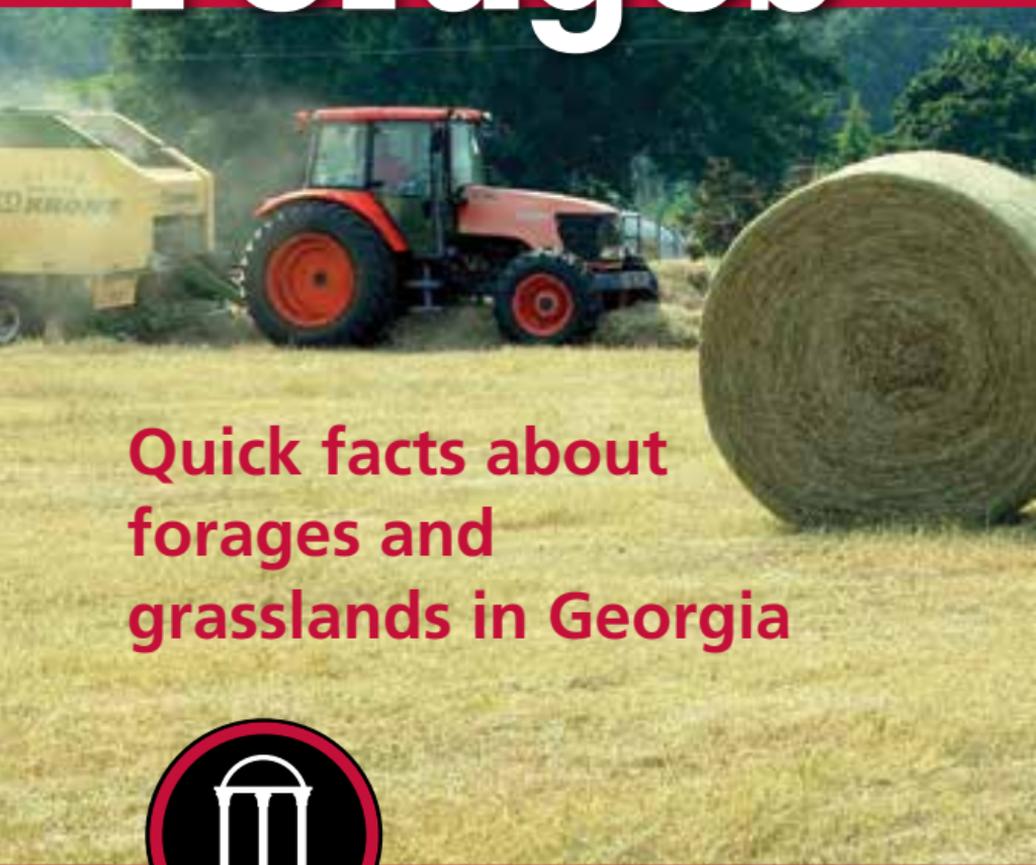




Georgia Forages



Quick facts about
forages and
grasslands in Georgia



The benefits of better grazing management

- Better utilization of forage.
- Growth rate of forage is optimized.
- Higher yield of forage.
- Higher stocking rates.
- More animal gains/milk production per acre.
- Reduces need for conserved forage (hay, silage, etc.) or supplements.
- Improves persistence of desirable forages, especially clover and legumes.
- Better weed suppression.
- Better distribution of nutrients within the pasture and away from streams and environmentally sensitive areas.
- More profitable and sustainable livestock production.

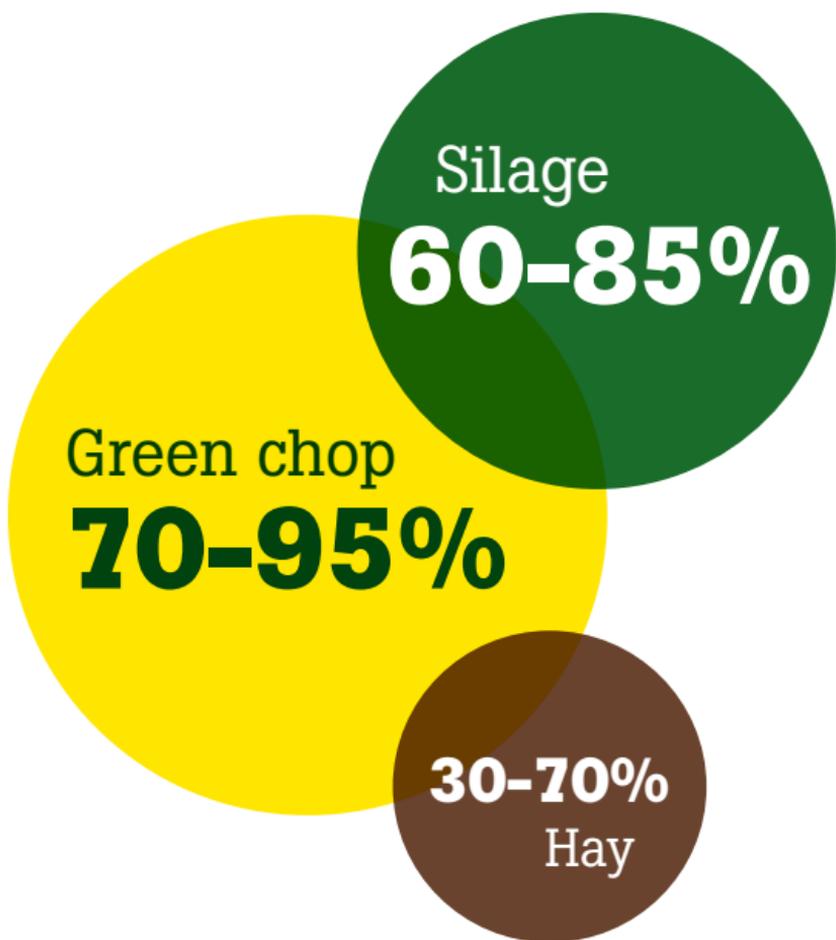




Ten keys to profitable forage systems

1. Know your forage options and match to your animal's needs.
2. Establish it right the first time.
3. Soil test, then lime and fertilized as needed.
4. Use legumes as much as possible.
5. Emphasize nutritional quality in your forages.
6. Prevent or minimize pests or plant related disorders.
7. Strive for efficient forage use.
8. Minimize stored feed.
9. Reduce storage and feeding losses.
10. Recognize that there is a difference between costs and investments, and that one's goal should be to minimize forage cost, not necessarily total cost per acre.

How much of what is in the field actually is consumed by the animal?



Mechanical

Continuous Stocking

30-40%

Slow rotation
(3-4 paddocks)

50-60%

60-70%

Moderate rotation
(6-8 paddocks)

Strip grazing,
daily rotation

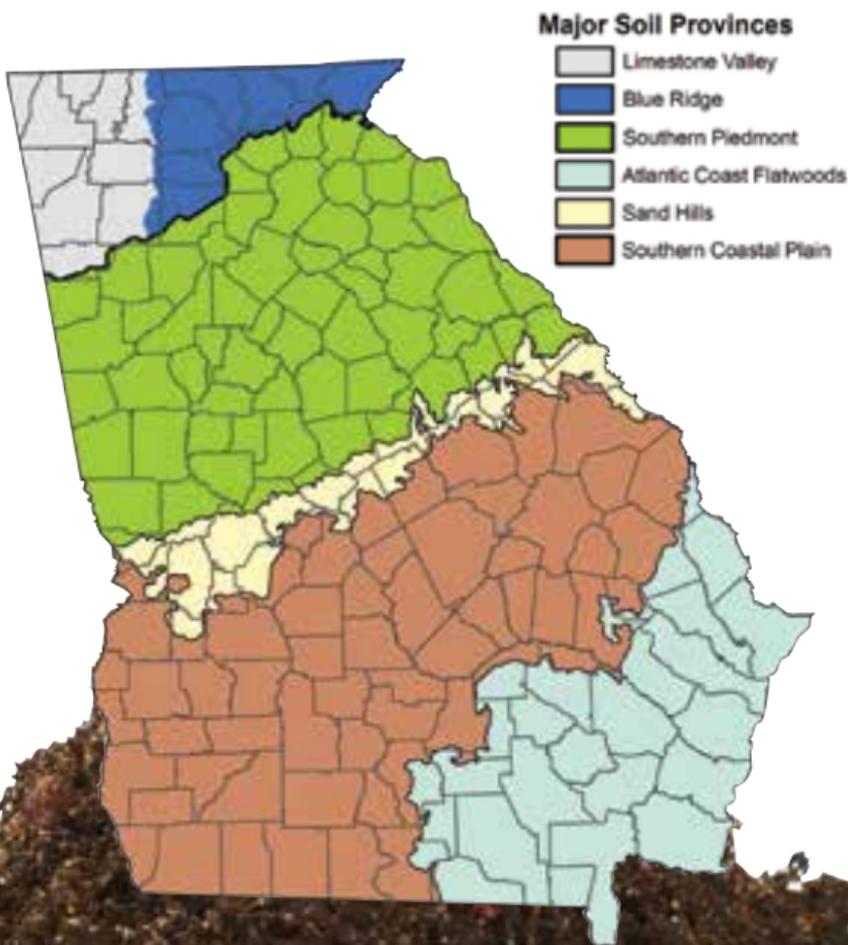
70-80%

Grazing

Soils of Georgia

Growing good forages requires good management of the soil.

Georgia has six major soil provinces:



LIMESTONE VALLEY | #1



Common Forages:

Tall fescue **P** **H**

White clover **P**

Annual ryegrass **P** **H**

Orchardgrass **H**

Bermudagrass **H**

Alfafa **H**

Limestone valley in northwest Georgia contains fertile upland soils that make excellent pastures. Steep and rolling terrain is mostly woodlands, but some areas can support pasture land if care is taken to establish sod-forming, permanent pastures. Because of the slope, there is an increased chance of soil erosion, so tillage should be kept to a minimum.

P Pasture **H** Hay

#2 | BLUE RIDGE

Common Forages:

- P H** Tall fescue
- P** White clover
- H** Orchardgrass
- H** Bermudagrass
- P H** Annual ryegrass
- H** Alfafa

The Blue Ridge province is well-adapted to cool-season, perennial pasture and hay production. Cold-hardy bermudagrasses can be used successfully for hay lands and summer grazing in this area, but are rare because of terrain and drainage issues. Winter annual pastures can be planted on any of the cultivated soils of this province. However, the upland soils have better drainage and are better suited to winter annual pasture.

P Pasture **H** Hay



SOUTHERN PIEDMONT | #3**Common Forages:**

- Tall fescue **P**
- Bermudagrass **P H**
- White clover **P**
- Annual ryegrass **P H**
- Crimson clover **P**
- Small grains **P**
- Bahiagrass **P**
- Alfafa **H**

The Southern Piedmont contains most of the state's forage-based livestock enterprises. Pastures in this region contain mixtures of cool-season and warm-season perennials, while hay lands are predominantly bermudagrass. Since the lower Piedmont is considered the southern edge of adaptation for tall fescue and the northern edge of adaptation for bahiagrass, some pastures may contain both. Shallow topsoil is prevalent due to intensive tillage and soil erosion. The best land for pastures is along the streams and river bottoms of this region.

P Pasture **H** Hay

#4 | SAND HILLS

Common Forages:

- P H** Bermudagrass
- P** Bahiagrass
- P H** Annual ryegrass
- P** Arrowleaf clover

Soil in the Sand Hills province is quite variable and is characterized by sandy soils and rolling terrain. This province is located near the Fall Line (where the Piedmont transitions to the Coastal Plain). Land that produces row crops in this area will provide acceptable forage yields. Because many of these soils are quite prone to drought, hybrid bermudagrasses that develop deep-root systems should be used for hay and grazing in this area.

P Pasture **H** Hay



COASTAL PLAIN | #5**Common Forages:**Bermudagrass **P** **H**Bahigrass **P**Annual ryegrass **P** **H**Arrowleaf clover **P**Crimson clover **P**Alfafa **H**Small grains **P** **H**

The Southern Coastal Plain is the second largest soil province. The terrain of the Coastal Plain becomes less rolling as one goes south. Soils in this province are typically sandy loam and more fertile. The best soils are in moist zones along streams. However, productive pastures can occur on better upland sites. Winter annual pastures often do best on upland soils in this area.

P Pasture **H** Hay

#4 | ATLANTIC COAST FLATWOODS

Common Forages:

- P H** Bermudagrass
- P** Bahiagrass
- P H** Annual ryegrass
- P** Arrowleaf clover
- P** Crimson clover
- P H** Small grains

The Flatwoods Province's best pasture soils are on good uplands and well-drained lowlands. Most of the uplands can produce winter annual pastures and perennial summer pastures. Closer to the Atlantic Coast, the soils are predominately poorly-drained and may not be suitable for pasture use. In poorly-drained Flatwoods soils, bahiagrass generally will persist better than bermudagrass.

P Pasture **H** Hay



BERMUDAGRASS | #1



Adaptation:

Bermudagrass is grown in all areas of Georgia except in the mountains. Varieties differ in cold hardiness. It is best adapted to sandy soils, but will also do well on clay soils. Bermudagrass is tolerant of close grazing but not of poor drainage. Hybrids are higher yielding, deeper rooted and more drought tolerant than common bermudagrass.

Establishment:

Seeded types should be planted at 5 to 10 pounds per acre in spring. Hybrids are planted from March or April with sprigs in rows of 15 to 20 bushels per acre.

Varieties:

Sprigged: [North Ga.] Russell or Tifton 85, south of Athens. [South Ga.] Tifton 85 and Russell.

Seeded types/blends (for small acreage): Cheyenne II, Ranchero Frio, Sungrazer, Sungrazer 777, CD 90160, KF194.

#2 | TALL FESCUE

Adaptation:

Tall fescue is grown in north and central Georgia, north of the Coastal Plain. It's best adapted to clay or loam soil while tolerant of soil acidity, poor drainage and close grazing. It is relatively tolerant of drought.

Establishment:

Seed should be drilled at 15 to 20 pounds per acre or broadcast at 20 to 25 pounds per acre in September or October.

Varieties:

MaxQ or Texoma MaxQ II for livestock pasture or hay.

Kentucky-31 can be planted for conservation and other non-livestock uses.



ANNUAL RYEGRASS | #3



Adaptation:

Annual ryegrass will grow well across the state. It tolerates poor drainage and close grazing. Soil pH should be kept above 6.0 for best results.

Establishment:

Seed should be planted at 10 to 15 pounds per acre in mixtures or 20 to 30 pounds per acre alone during September or early October.

Varieties:

Attain, Big Boss, Early Ploid, Diamond T, Jumbo (CP), Marshall, Nelson, Passerel Plus (P, M), Prine, Rio (CP, P), TAMTBO and Verdure (CP).

#4 | BAHIAGRASS

Adaptation:

Bahiagrass is grown in south and central Georgia. It's best adapted to sandy soils. It is also tolerant of drought, poor drainage, acid soils, low fertility and close grazing. Bahiagrass grows aggressively and forms a dense sod.

Establishment:

Plant scarified seed at 15 to 20 pounds per acre in March or April.

Varieties:

Tifton 9, TifQuik or UF-Riata. All of these are higher yielding than Pensacola and better suited for pasture and hay production.



WHITE CLOVER | #5



Adaptation:

While white clover will grow well across the state, it does best on clay soils north of the Coastal Plain and on wet Flatwoods soils or well irrigated pastures in South Georgia. It's tolerant of moderate soil acidity and wetter soils. White clover will grow best with cool season perennial grasses.

Establishment:

Seed should be broadcast at 2 to 3 pounds per acre during October-November or February-March.

Varieties:

[North Ga.] Durana and Patriot

[South Ga.] Durana, Patriot, Osceola and Louisiana S-1.

#6 | SMALL GRAINS: OATS

Adaptation:

Oats can be grown in south and central Georgia, but can be winterkilled in some years. Soil pH should be kept above 6.0 for best results.

Establishment:

Oats should be planted at 90 to 120 pounds per acre if grown alone or at 60 to 90 pounds per acre if grown in a mixture.

Varieties:

Horizon 201, Plot Spike
LA 9339 (CP), SS76-40
and RAM LA99016.

If seed is available, NF27 and
NF95418 is preferred.



SMALL GRAINS: WHEAT | #6



Adaptation:

Wheat will grow well across the entire state. It's not tolerant of soil acidity.

Establishment:

Wheat should be planted at 90 to 120 pounds per acre if grown alone or at 60 to 90 pounds per acre if grown in a mixture.

Varieties:

AGS 2038, Coker 9553, Pioneer 26R61, Roberts (P,M), SS8641 and USG 3592

#6 | SMALL GRAINS: RYE

Adaptation:

Rye will grow well across the entire state. It's more tolerant of soil acidity than oat or wheat.

Rye will mature quickly, so quality may decline fast. Timely grazing or harvest management will be required.

Establishment:

Rye should be planted at 90 to 120 pounds per acre if grown alone or at 60 to 90 pounds per acre if grown in a mixture during September or October.

Varieties:

AGS104, Bates, Early Graze, Oklon, Wintergrazer 70, Wrens Abruzzi and Wrens 96.

Early: FL 401 (CP).



CRIMSON CLOVER | #7



Adaptation:

Crimson clover grows well in the Coastal Plain and lower Piedmont regions. It's fairly tolerant of soil acidity but does not tolerate poor drainage.

Establishment:

Seed should be drilled 15 to 20 pounds per acre or broadcast at 20 to 30 pounds per acre in September or October.

Varieties:

Dixie, Flame, AU-Robin, Chief, and Tibbee also work well, but their seed may be limited. AU-Robin and Flame produce more winter growth than the old-variety Dixie. Tibbee and Chief may also provide satisfactory results.

#8 | ARROWLEAF CLOVER

Adaptation:

Arrowleaf clover grows in the Coastal Plain and lower Piedmont. It requires well drained soil and is not tolerant of soil acidity or low fertility.

Establishment:

Scarified seed should be planted at 5 to 10 pounds per acre in September to early November. It is an excellent reseeder.

Varieties:

Apache. This variety has virus disease resistance but is still susceptible to crown and stem rot, which wiped out most plantings of the Yuchi variety.



ALFALFA | #9



Adaptation:

Alfalfa will grow well across the entire state. It's very drought tolerant. However, it requires well-drained soil and does not tolerate low soil fertility or acidity.

Establishment:

Drill seed 18 to 25 pounds per acre with a cultipacker seeder or broadcast 22 to 25 pounds per acre on a prepared seedbed in September.

Varieties:

[North Ga.] BaraWet 501, Bara-503, Bulldog 505, CW 500, Evermore, HybriForce 600, HybriForce 700, Phoenix.

[South Ga.] Attention II, BaraWet 501, Bulldog 505, Bulldog 805, HybriForce 600, HybriForce 700, PGI 801, TS 8031.

#10 | ORCHARDGRASS

Adaptation:

Orchardgrass is a short-lived grass that should only be planted north of Gainesville. It is less tolerant of drought, poor drainage and close grazing than tall fescue.

Establishment:

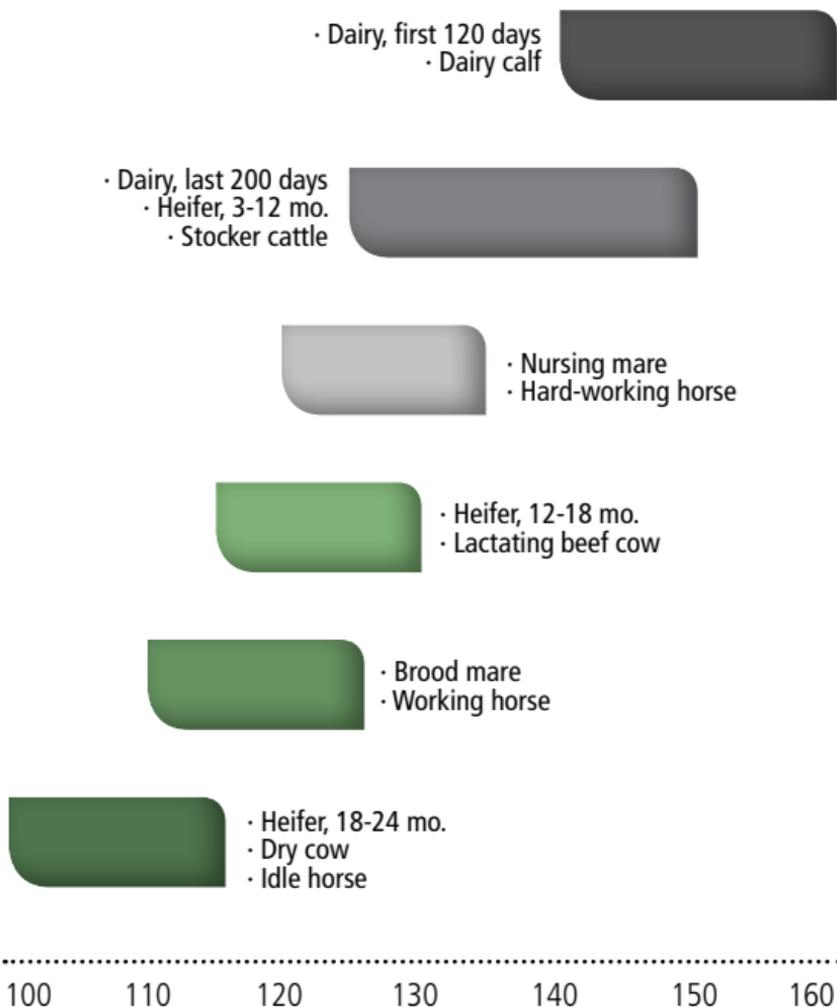
Seed should be planted at 15 to 20 pounds per acre in September.

Varieties:

Benchmark, Olympia and Persist.



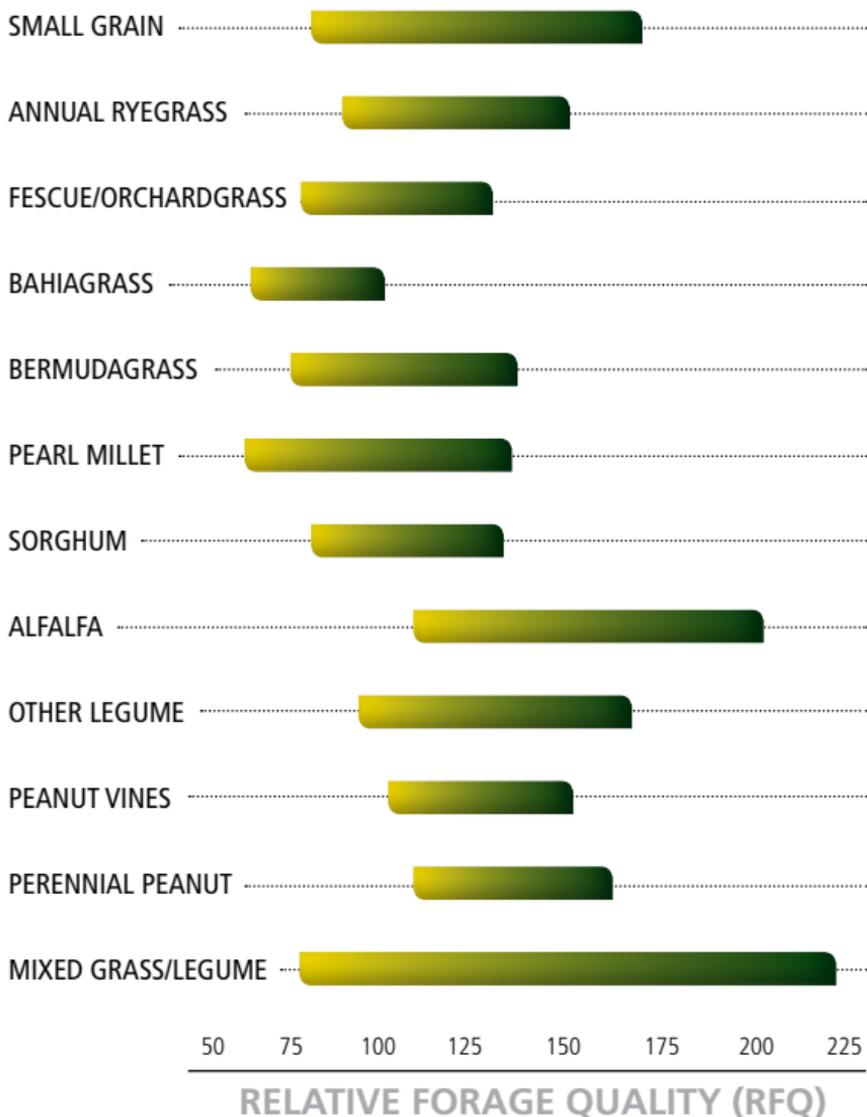
Relative forage quality needed by various classes of animals



RELATIVE FORAGE QUALITY (RFQ)

Adapted from Undersander et al., 2011.

Average and typical variability of relative forage quality provided by common forages in Georgia

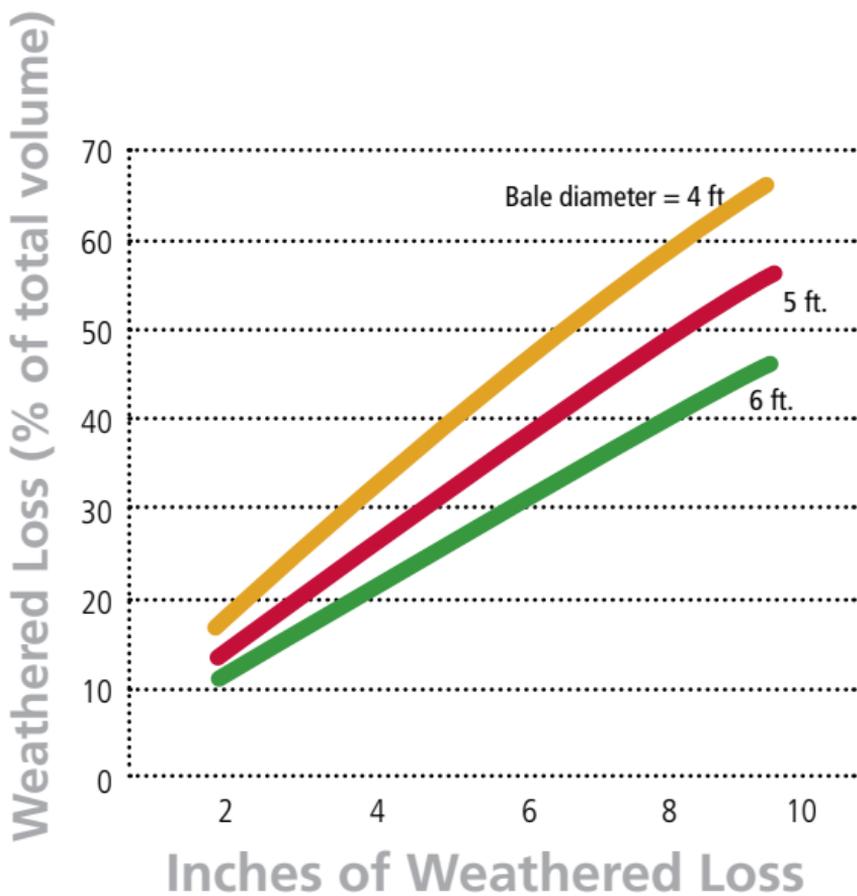


Grazing rules of thumb for forage crops

Crop	Target Height (inches)		Recommended Rest Period (days)
	Begin Grazing	End Grazing*	
Alfalfa (grazing types)	10-16	2-4	15-30
Annual ryegrass	6-12	3-4	7-25
Bahiagrass	6-10	1-2	10-20
Clover, white	6-8	1-3	7-15
Clovers, other	8-10	3-5	10-20
Orchardgrass	8-12	3-6	15-30
Pearl millet	20-24	8-12	10-20
Small grains	8-12	4	7-30
Sorghum/sudan	20-24	8-12	10-20
Switchgrass	18-22	8-12	30-45
Tall fescue	4-8	2-3	15-30

* Height at end of grazing may need to be higher to optimize intake of quality forage or vigorous regrowth.

Losses when round bales are stored outside depends on weathered layer



Typical hay storage losses

Storage Method	Twine	Net Wrap
	% of dry weight	
Pole barn	2-5%	2-5%
Hoop structure	2-5%	2-5%
Tarp	5-10%	5-8%
Stack pad		
covered stack	5-10%	5-8%
uncovered stack	15-40%	10-30%
Plastic wrap	5-10%	N/A
Outside on ground		
well-drained	20-40%	15-40%
poor drainage/shaded	30-60%	30-45%

Typical hay feeding losses

Item	Waste
Cone	2-5%
Ring	4-7%
Trailer	10-13%
Cradle	15-20%

Why are grasslands so important?

- **Grasslands cover over 32 percent of the Earth's land area.**
 - Including over 55 percent of the U.S.
- **Grasslands are one of the most biologically diverse habitats.**
 - Home to many birds, insects, reptiles, mammals, and more.
 - True ecosystems.
- **Grasslands are the primary source of forage and browse for:**
 - Over 250 species of ungulates (hoofed-animals).
 - Domesticated ruminants (cattle, sheep, goats, etc.) and modified monogastrics (horses, mules, etc.).



Grasslands and the economy

- **The forage-based livestock industry contributes more than \$60 billion to the U.S. economy annually.**
 - The hay crop is valued at \$11 billion, which is the third most valuable crop in the U.S. after corn and soybeans.
 - These industries directly contribute approximately \$2 billion to Georgia's economy.
- **There are approximately 4 million acres of pasture, hay and silage in Georgia (10.5 percent of the total area).**
 - This includes 3.4 million acres of pasture land and about 600,000 acres of hay land.
 - The total of all other field crops is less than 3 million acres.

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