

TOP 10 GEORGIA FORAGES: AT A GLANCE

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We are blessed to live and farm in state with so much diversity. As a forage guy, I thoroughly enjoy the challenge of understanding and promoting the use of the more than 60 different forage species that we are capable of growing in Georgia.

From time to time, I'm asked, "What are the most important ones?" Well, it is kind of like picking your favorite among your kids. I just can't! However, one could approximate such a list by giving some weight to the number of acres planted, economic value of the output from the crop, and how important it is to the profitability of the forage-based livestock industries in the state. In the spirit of this month's focus on forages, I have developed a list of what I think are the 10 most important forage crops in Georgia.

No. 10) Alfalfa



Alfalfa (*Medicago sativa*)

AT-A-GLANCE

Adaptation: Entire state. Very drought tolerant. Requires well drained soil and does not tolerate low soil fertility or acidity.

Establishment: Seed 18 to 25 lb/A drilled with a cultipacker seeder, 22-25 lb/A broadcast 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.
* Bolded entries indicate superior yielding and stand ratings after 3 years.

Alfalfa is often referred to as the "Queen of Forages" because it produces high yields that are highly digestible and high in protein. New varieties of alfalfa have made it possible for it to be effectively utilized in managed grazing, hay, or silage systems. Alfalfa is now planted on over 15,000 acres in Georgia, from LaFayette to Lake Park and in many places in between.

Alfalfa requires deep, well-drained soils. It develops a deep root system if root growth is not restricted by hardpans, high water tables, or acid subsoil. Alfalfa requires a combination of proper soil characteristics (well-drained, fertile, low acidity, etc.) and outstanding management (appropriate variety selection, timely harvests, pest control, etc.) to maintain long-lived, productive stands. But, it is definitely worth the trouble! It produces 4-6 tons per acre in rainfed fields, and up to 8 tons per acre in irrigated fields in south Georgia. Plus, the relative forage quality (RFQ) is typically 140 or more. For more details, see Extension Bulletin B1350: "Alfalfa Management in Georgia" (available at: <http://pubs.caes.uga.edu/caespubs/pubcd/B1350/B1350.htm>).

No. 9) Arrowleaf Clover



Arrowleaf Clover (*Trifolium vesiculosum*)

It has a very low bloat potential, and its late spring production extends the grazing season while providing excellent quality forage.

Sod-seeding arrowleaf into warm season perennial pastures is an excellent way to achieve spring grazing and to introduce biologically-fixed N into the system. However, unchecked vigorous spring growth can reduce early spring growth of the perennial grass. In overseeded pastures, closely graze arrowleaf clover during the spring to avoid a full canopy developing over the perennial grass. Arrowleaf is a prolific seed producer, much of which will be hard seed. As a result, arrowleaf is considered a good reseeded if it is allowed to mature. To allow reseeding, remove animals from the paddocks or reduce stocking rates in late April or early May when the clover starts to flower. For more details, see the web page entitled "Forage Species and Varieties Recommended for Use in Georgia" (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

No. 8) Crimson Clover



Crimson Clover (*T. incarnatum*)

AT-A-GLANCE

Adaptation: Coastal Plain and lower Piedmont. Requires well-drained soil, not tolerant of soil acidity or low fertility.

Establishment: Plant scarified seed at 5 to 10 lb/A in September to early November. Excellent reseeded.

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

Arrowleaf clover is a highly productive winter annual clover grown in many places in the southern two-thirds of Georgia. It is most productive on well-drained loam or sandy loam soils but can do well on well-drained clay soils. It will not tolerate acid soils. This clover is most productive in April/May, about 3 weeks later than crimson clover and produces well about 6 weeks (or more) longer in spring. Arrowleaf is a good clover to include in grazing mixtures. It

AT-A-GLANCE

Adaptation: Coastal Plain and lower Piedmont. Fairly tolerant of soil acidity but does not tolerate poor drainage.

Establishment: Seed drilled 15-20 lb/A or broadcast at 20 to 30 lb/A in September-October.

Varieties: Dixie. Also, Flame, AU-Robin, Chief, and Tibbee, 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.

Crimson clover is an excellent winter annual legume and often serves as a benchmark by which other cool season annual legumes are compared. Crimson furnishes some grazing in late fall and winter and abundant grazing in early spring. Crimson matures (flowers) earlier in spring than the other annual clovers, produces high yields even in cool winters, and has a shorter grazing season. Several varieties are now available that mature very early. This allows it to grow, be utilized, add biologically-fixed N to the soil, and die

with minimal competition with warm season perennial grasses. It grows best on well-drained soils and is frequently used in mixtures with ryegrass and small grains for winter grazing. It is also commonly used to overseed bermudagrass and bahiagrass pastures. Unfortunately, crimson produces relatively few hard seed and its seed heads are often damaged by clover head weevils. As a result, crimson clover usually does not reseed dependably in a grazing system. For more details, see the web page entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

No. 7) White Clover



White clover (*Trifolium repens*)

AT-A-GLANCE

Adaptation:	Entire state on clay soils north of Coastal Plain, also in south GA on wet flatwoods soils or well irrigated pastures. Tolerant of moderate soil acidity and wetter soils. Grows best with cool season perennial grasses.
Establishment:	Seed broadcast at 2 to 3 lb/A in October-November or February-March.
Varieties:	North GA – Durana and Patriot South GA – Durana, Patriot, Osceola and Louisiana S-1

White clover is one of the most widely-grown forage legume crops in the world. It is adapted to a wide range of soils and climates and is grown for forage throughout Georgia. White clover grows best on moist soils and can die during hot, dry summers. However, some new varieties of white clover are more persistent and will either survive these conditions or return from seed. This legume is generally most productive on fertile soils along streams, while it is least productive and least persistent in deep sands.

White clover is a relatively low growing legume that spreads by stolons and can tolerate close grazing. It furnishes grazing in fall, late winter, and spring. Yields of white clover are usually not sufficient for it to be grown alone or in a hay crop, but it contributes a substantial amount of high quality forage when produced with cool season perennial grasses, such as tall fescue. White clover is also compatible with some bermudagrass varieties, when grown in pastures.

There are three basic types of white clover: large (e.g., Ladino clover, ‘Patriot,’ ‘Regal’), intermediate (e.g., ‘Durana,’ ‘Osceola’), and low growing (e.g., Dutch clover). Large or ladino types are higher yielding than other types, but they do not reseed as well as the other types and are generally more short-lived. The intermediate types are well-adapted to most sites throughout Georgia. They are prolific reseeder and may act as annual plants in south Georgia. Some improved intermediate white clovers are exceptionally tolerant of grazing and persist very well, even in some drought-prone and infertile sites. Low-growing types are commonly seen growing on roadsides and in yards. Although they also are prolific reseeder, they are not planted for forage because of low yields and a poor ability to compete with grasses. For more details, see the web page entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

No. 6) Oats



Oat (*Avena sativa*)

in late fall/early winter and spring. Oat is not as cold hardy as rye and can winter-kill during harsh winters. This crop produces more forage in spring than rye and can be cut for hay or silage. However, it is not as productive as ryegrass in the spring and is not very grazing tolerant when grazed extensively in January and February. Planting oats in a mixture with ryegrass and/or a winter annual legume will produce more total forage over a longer grazing season than oat alone. For more details, see the web page entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

AT-A-GLANCE

Adaptation:	South and central GA. Oat can be winterkilled in some years. Soil pH should be kept above 6.0 for best results.
Establishment:	Grown alone at 90-120 lb/A or 60-90 lb/A in a mixture
Varieties:	Horizon 201, Plot Spike LA 9339 (CP), SS76-40, and RAM LA99016. (if seed is available: NF27 and NF95418)

Oat is a small grain often used for high quality winter forage production in the southern two-thirds of Georgia. When seeded in early-fall, oats furnish forage

No. 5) Rye



Rye (*Secale cereale*)

more forage in the winter than the other small grains. Since it matures earlier than any other winter annual, it is well-suited for early grazing or baled silage production on crop land that must be prepared in early spring for summer row crops. Forage quality declines rapidly in spring as the plants become stemmy and leaf production decreases. Varieties differ in maturity and some varieties will begin seed head production as early as mid-January in south Georgia. Mixing rye with ryegrass or annual legumes will extend the grazing period. For more details, see the web page entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

AT-A-GLANCE

Adaptation:	Entire state. More tolerant of soil acidity than oat or wheat. Rye will mature quickly and quality may decline fast. Timely grazing or harvest management will be required.
Establishment:	Plant 90 to 120 lb/A alone or 60 to 90 lb/A in mixtures during September or October.
Varieties:	AGS104, Bates, Early Graze, Oklon, Wintergrazer 70, Wrens Abruzzi, and Wrens 96 Early: FL 401 (CP)

Rye is the most drought tolerant and winter hardy small grain grown in Georgia. It is also more tolerant of soil acidity than other winter annual grasses. It can be planted in early fall and usually produces good grazing by late fall. Rye produces

No. 4) Bahiagrass



Bahiagrass (*Paspalum notatum*)

AT-A-GLANCE

Adaptation:	South and Central GA. Best adapted on sandy soils. Tolerant of drought, poor drainage, acid soils, low fertility, and close grazing. Very aggressive and forms a dense sod.
Establishment:	Plant scarified seed at 15 to 20 lb/A 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.

Bahiagrass is a deep-rooted perennial adapted to a wide range of soils in the southern third of Georgia's Piedmont region and throughout the Coastal Plain region. It spreads by short, stout stolons and is a prolific seed producing plant. Bahiagrass will grow on soils too poorly-drained for bermudagrass, is more shade tolerant than bermudagrass, and can be used in woodland pastures (silvopasture). Though it responds to proper fertility, it does not respond to high fertility as well as improved bermudagrasses and will persist in pastures with a low level of management.

Bahiagrass forage is slightly lower in quality than most hybrid bermudagrasses. Close grazing is necessary to obtain good utilization.

Bahiagrass can become a pest in hybrid bermudagrass hay fields. Keep this in mind when rotating cattle, because seed will germinate after passing through cattle. Bahiagrass introduced to a field (through seed in cattle manure) can crowd out already-established bermudagrass. For more details, see the Extension Bulletin entitled "The Management and Use of Bahiagrass" (http://www.caes.uga.edu/Publications/pubDetail.cfm?pk_id=7862).

No. 3) Annual Ryegrass



Annual Ryegrass (*Lolium multiflorum*)

AT-A-GLANCE

Adaptation:	Entire state. Tolerates poor drainage and close grazing. Soil pH should be kept above 6.0 for best results.
Establishment:	Seed at 15 to 25 lb/A in mixtures or 25 to 30 lb/A alone during September or early October.
Varieties:	Early Varieties: Attain, Big Boss (CP), Bulldog (aka Grazer), Diamond T, Early Ploid, Flying A, Marshall**, Nelson, Prine, Rio, TAMTBO, and Verdure. Late Varieties: Attain, Big Boss, Early Ploid (CP), Jumbo, Marshall**, Nelson, Passerel Plus, Prine, Rio (CP, P), TAMTBO, and Verdure (CP) Season-Long: Attain, Big Boss, Early Ploid, Diamond T, Jumbo (CP), Marshall**, Nelson, Passerel Plus (P, M), Prine, Rio (CP, P), TAMTBO, and Verdure (CP)

**A variety that should not be planted within 100 miles of the Gulf of Mexico or 50 miles from the Atlantic Coast because of the risk of severe yield declines due to leaf rusts or other fungal infections.

Annual ryegrass (commonly referred to as simply “ryegrass” in Georgia) is a well-adapted winter annual that can be planted in prepared seedbeds or overseeded onto perennial grass sods for late winter and spring grazing. Some newer varieties may even provide some late fall grazing if planted early and/or into a prepared seedbed. Ryegrass is also often seeded in mixtures with a small grain and/or clover. Ryegrass has a later grazing season than the small grains and can be grazed until early May in south Georgia and late May or early June in north Georgia when moisture is adequate.

Ryegrass is one of the highest quality forages that can be grown in Georgia, often providing over 70% TDN and 18% CP if grazed in the late vegetative stage. High quality (56-64% TDN and 10-16% CP) can also be expected in the early stages of seedhead development. However, quality and palatability of late season forage can be low due to disease (mainly rust) and maturity.

Since it can produce such high quality when properly managed, it often is planted for high quality hay or silage cuttings (usually 1 or 2) in the spring. It is also commonly planted into dormant bermudagrass hayfields. This is a recommended practice, but the ryegrass should be mowed, cut for hay, or grazed before the bermudagrass comes out of dormancy. This harvesting of ryegrass should be timed (usually late March in south Georgia and late April in north Georgia) so as to prevent the ryegrass from suppressing the spring emergence of bermudagrass. For more details, see the web page entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

No. 2) Tall Fescue



Tall Fescue (*Lolium arundinaceum*)

AT-A-GLANCE

Adaptation:	North and central GA north of the Coastal Plain. Best adapted in clay or loam soil. Tolerant of soil acidity, poor drainage, and close grazing. Relatively tolerant of drought.
Establishment:	Seed drilled at 15 to 20 lb/A or broadcast at 20 to 25 lb/A in September or October.
Varieties:	MaxQ or Texoma MaxQ II (both are novel endophyte varieties) for livestock pasture or hay. Kentucky-31 can be planted for conservation and other non-livestock uses.

Tall Fescue is a cool season perennial that is well-adapted to areas north of the Fall Line/Sand Hills area. Over 1 million acres of tall fescue are used for pasture in north Georgia. Fescue is a deep-rooted bunch grass that is productive during fall, late winter and spring. More than half of the total yearly production occurs in spring. It does not grow well in mid-summer unless climatic conditions are favorably mild.

Fescue produces its highest yields along creek bottoms in north Georgia. Production declines on hillsides and ridges as moisture becomes limiting. Tall fescue does not persist well in the Coastal Plain region, under normal growing conditions.

With sufficient fall moisture and an application of up to 60 lbs of N per acre, a substantial flush of tall fescue growth will occur in the autumn. This high quality forage can be stockpiled (allowed to accumulate) in pastures and hay fields from August through October and then grazed later in the fall and early winter. This deferred grazing (grazing after forage has been allowed to accumulate) of stockpiled forage can be an effective method for reducing winter feed costs.

Tall fescue is best used for grazing and hay production. Forage quality and feed distribution are improved when an adapted legume (such as white clover or red clover) is grown in association with fescue. Close grazing (3 – 6 in.) in a rotational grazing system helps to keep forage quality high and also helps keep clover in the stand. Unlike bermudagrass, fescue does not respond to exceptionally high N rates. Tall fescue

pastures that are on productive sites can benefit from up to 100 lbs of N per acre and support a high stocking rate. However, most fescue pastures in north Georgia are moderately stocked and are on marginal sites that will receive no benefit from N applications in excess of 50 lbs of N per acre. If clover comprises less than 15 percent of the stand, treat it as a grass stand. Reduce N rates to 20 to 30 pounds per acre if the stand contains 15-35% legumes. If the stand contains more than 35% legumes, no supplemental N is needed. For more details, see the Extension Bulletins entitled “Novel Endophyte-Infected Tall Fescue” (http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7045) and “Stockpiling Tall Fescue for Fall and Winter Grazing” (http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7736).

No. 1) Bermudagrass



Bermudagrass (*Cynodon dactylon*)

AT-A-GLANCE

Adaptation:	Grown in all areas of GA except in mountains. Varieties differ in cold hardiness. Best adapted on sandy soils but will do well on clay soils. Hybrids are higher yielding, deeper rooted, and more drought tolerant than common bermudagrass. Tolerant of close grazing. Not tolerant of poor drainage.
Establishment:	Seeded types planted at 5 to 10 lb/A in spring. Hybrids are planted in May-July with sprigs at a rate up to 40 bu/A in rows.
Varieties:	Sprigged: Russell, Tifton 85 (south of I-85), Tifton 44, and Coastal. Seeded types/blends (for pasture and if <10 acres): Cheyenne II, Rancho Frio, Sungrazer, Sungrazer 777, CD 90160, KF194.

Bermudagrass is a high-yielding, sod-forming grass that is well-suited for grazing or hay production. It grows best on well-drained, fertile soils where ample moisture is available. Bermudagrass does not persist on poorly-drained Flatwoods soils but can be successfully grown on deep sandy soils because of its deep root system. Bermudagrass and forage mixtures that include bermudagrass is grown on approximately 1.5 million acres of

pastureland and around 350,000 acres of hayland in Georgia, making it the most economically important forage crop in the state by far.

Georgia has played important roles in the history of forage bermudagrass in the U.S. and around the world. Common bermudagrass was reportedly introduced into the U.S. (probably from either India or Africa) in 1751 by Georgia’s second royal governor, Henry Ellis, in Savannah. Researchers and plant breeders from Georgia have also made significant advances that resulted in improved bermudagrass yields and forage quality. During his career, Dr. Glenn Burton, plant geneticist at the Georgia Coastal Plain Experiment Station (GCPES) in Tifton from 1936-1997, developed several hybrid bermudagrasses for southern forage programs. His most successful releases (e.g., ‘Coastal,’ ‘Tifton 44,’ and ‘Tifton 85’) continue to be recommended throughout the southeastern USA and in similar climates around the world. (A three-part history of the development of bermudagrass as a forage crop was presented in the August, September, and October issues of the Georgia Cattlemen magazine in 2011. This series is archived here: http://www.caes.uga.edu/commodities/fieldcrops/forages/Ga_Cat_Arc/2011/2011.html). The warm season grass breeding program at the GCPES has continued this legacy of significant improvement in forage bermudagrass, with new and improved cultivars on the horizon.

Detailed information about vegetatively-propagated and improved seeded varieties of bermudagrass is provided in the Extension Circular entitled “Selecting a Forage Bermudagrass Variety” (http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=7734). For more details, see the web page

entitled “Forage Species and Varieties Recommended for Use in Georgia” (<http://www.caes.uga.edu/commodities/fieldcrops/forages/species.html>).

More Information

Additional information about these and many other forage species can be found by visiting our website at www.georgiaforages.com. If you have additional forage management questions, visit our website or contact your local University of Georgia Cooperative Extension office by dialing 1-800-ASK-UGA1.

got questions?

Have a question or topic that you want Dr. Hancock to address? Email him at: questions@georgiaforages.com.

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