



Perennial Legumes

Legumes can capture nitrogen from the atmosphere and transform into compounds that are available in the soil solution for plants. This process is called nitrogen biological fixation and occurs through a symbiotic association between the legume plant and microorganisms. Following are common perennial legumes adapted to the Southeast:

- **Cool-season species:** alfalfa and white clover
- **Warm-season species:** rhizoma perennial peanut and sericea lespedeza

COOL-SEASON SPECIES

ALFALFA

Alfalfa is a high-yielding perennial legume that is well suited for hay, silage, baleage, and grazing. Alfalfa requires well-drained, high-fertility soil and has limited tolerance to pests and disease pressure.

Prior to planting alfalfa, soil pH and fertility testing must be conducted. Collect soil samples to a 15-inch depth, dividing the soil profile into two layers: surface (0 to 8 inches) and subsoil (8 to 15 inches). Optimum soil pH is 6.5 to 7.0 in the topsoil surface and approximately 5.5 in the subsoil.

Complete lime application at least 6 months prior to planting to allow for soil incorporation. If the subsoil pH remains acidic, application of gypsum (CaSO_4) can be an alternative to help neutralize it. Adequate levels of boron (B) and molybdenum (Mo) are essential for nodule formation for biological nitrogen (N) fixation, and some varieties may include base levels of these in the seed coat for establishment.

Most alfalfa seed is preinoculated and requires proper storage and handling to guarantee seed quality. If seeds purchased are not inoculated, or inoculum viability is unknown, inoculant (Type A, *Rhizobium meliloti*) should be purchased and applied according to label instructions.

The recommended seeding rate is 20 to 25 pounds per acre and seeding depth is about ¼ inch. A general recommendation after establishment is to apply 12 pounds of phosphorus (P_2O_5) and 50 pounds of potash (K_2O) per acre for every ton of alfalfa harvested. Supplemental molybdenum and boron are recommended yearly or every other year during the life of the stand. See table 3 for the seeding date window for fall and spring planting in Alabama.

Table 3. Seeding Date Window for Fall and Spring Alfalfa Planting in Alabama

Location/Planting Date	Seeding Date Window	Comments
North Alabama (Fall)	Aug. 15 – Oct. 1	Requires 6 to 8 weeks of growth prior to first hard frost event
South Alabama (Fall)	Oct. – Nov. 1	



Figure 22. Use of alfalfa-bermudagrass mixture has increased.

ALFALFA-BERMUDAGRASS MIXTURES

In the Southeast, seeding alfalfa with bermudagrass (figure 22) is a viable alternative since both species have similar soil drainage and fertility requirements. Mow or graze the warm-season grass to a short stubble height (approximately 2 inches) before planting. Then spray glyphosate at a rate of 9 ounces per acre of 5.5 pounds of active ingredient to induce grass dormancy and control weeds.

The general recommended seeding rate for mixed alfalfa-grass stands is 12 to 15 pounds per acre of PLS spaced on 14-inch rows. Use a no-till drill to plant no deeper than ½ inch.

Once the stand is established, nitrogen fertilization is not needed if at least 30 percent alfalfa is present in the stand. It is recommended to soil test annually and apply phosphorous and potassium according to recommendations. Potassium fertilization is especially important; a rate up to 300 pounds per acre administered in split applications throughout the season is recommended.

Apply boron annually at a rate of 2 to 3 pounds per acre. This can be foliar applied or in a granular form blended with other fertilizers. Apply molybdenum every 2 years in late winter or early spring at a rate of 3 ounces per acre (8 ounces of sodium molybdate in 25 gallons of water per acre). Defoliation events should occur when the stand is at 10 percent bloom, or generally every 28 to 35 days. Recommended stubble height is 4 inches.

Timing of the first harvest of the season is critical to help ensure suitable growth conditions for both species in the mixture. Proper moisture for baling is less than or equal to 20 percent for hay and 40 to 60 percent for baleage.

Scout fields often from spring through late fall to address any pest problems in a timely manner. For grazing-tolerant varieties, rotational stocking is recommended with a stubble height of 4 inches and rotation of animals every 28 to 35 days.

WHITE CLOVER

White clover (figure 23) is a cool-season perennial legume with creeping growth habit. Tolerant to grazing, it is often planted in a mixture with other cool-season forages to extend the grazing season. The optimum pH is 5.5 to 6.0, and proper soil fertility is necessary for establishment, persistence, and productivity.

Before planting white clover, it is important that no herbicide residual is in the soil; this can lead to stand failure. The recommended seeding rate is 2 to 3 pounds PLS per acre, and the planting window ranges from August 25 to November 1. Seeding depth should not exceed ¼ to ½ inch. A mature stand of white clover can fix up to 150 pounds of nitrogen per acre.

In a clover-containing system, improved forage yield and quality increases animal performance. Crude protein ranges from 15 to 25 percent with high digestibility. Rotational grazing is recommended with stubble height of 2 to 4 inches. Although white clover is more tolerant to 2,4-D applications than other clovers, this herbicide can damage a stand unless rates are low.



Figure 23. White clover is often planted in a mixture with other cool-season forages.

WARM-SEASON SPECIES



Figure 24. Rhizoma peanut grows well in the Gulf Coast region.

RHIZOMA PEANUT

Rhizoma peanut (figure 24) is originally from South America and is well adapted to the Gulf Coast region (the southeastern counties in Alabama). It has high yield and nutritive value and can be used for hay production or under grazing management. New varieties and technologies have helped to decrease establishment costs and cope with its slow rate of establishment.

Prepare soil and test soil pH/fertility prior to planting. Apply lime and fertilizer as recommended. Take proper weed control measures prior to planting a monoculture.

Rhizoma peanut is established by vegetative propagation using rhizomes. The planting rate is 80 bushels of rhizomes per acre. Ideally rhizomes should be planted at a depth of 1 inch. Plant in late March through early July.

A growing practice is to plant rhizoma peanut into warm-season perennial grasses, such as bermudagrass and bahiagrass. Strip-planting is often used. This involves applying a herbicide to control the grass and then planting rhizoma peanut, which will then spread horizontally into the field.



Figure 25. Sericea lespedeza is well adapted to the Southeast region..

SERICEA LESPEDEZA

Sericea lespedeza (figure 25) is a warm-season perennial legume native to eastern Asia and well adapted to the Southeast region. It is deep rooted and grows well on medium-to-well-drained and clay to loamy soils.

Sericea lespedeza may be used for hay production or managed under grazing conditions. Generally it grows from April through November 1, with peak forage production June through August. Seeding rate is 20 to 30 pounds PLS per acre, and the planting window runs from March 15 to May 1.

Forage quality ranges from 12 to 16 percent crude protein and 50 to 55 percent digestibility. As height increases to 24 inches or more, however, sericea becomes fibrous and less digestible.

Tannin is a naturally occurring compound in sericea that is linked to reduced intake and digestibility of the forage. However, tannins increase the amount of protein bypassing the rumen of livestock, contributing to more efficient use of the feed. In small ruminants, therefore, sericea helps to reduce internal parasite loads, including *Haemonchus contortus* (barber pole worm).



Figure 26. Sericea lespedeza has deep roots..