



Warm Season (Summer) Forage Legume Guide ¹

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Warm-season legumes, also known as summer legumes, are important in some grazing and hay production systems in Florida. They include a wide range of plant types that are adapted to hot, humid condition. When properly inoculated, they supply nitrogen (N) for their own growth and for other plants growing with them or following them. They generally improve the level of nutrition when seeded into tropical grass pastures.

Warm-season forage legumes are being grown in practically all parts of Florida. More than twenty thousand acres are grown in the state at the present time, and it is anticipated that the acreage will increase in coming years.

INOCULATION OF SEED

Forage legumes have the ability to convert N from the atmosphere to forms that plants can use if certain bacteria are in the soil where the plant is growing. The bacteria form nodules on the plant roots and the legumes accumulate N for their growth. Some soils may already contain the bacteria that are needed, but new ground and areas where the legume has not been grown before likely will not have the bacteria. In

either situation, inoculation of the seed with the proper bacteria is recommended because it is cheap insurance.

Not all legumes use the same bacteria for the N-fixing process. The N-fixing bacteria are divided into several groups and care must be taken to purchase the correct one for the legume to be planted.

These bacteria can be introduced into the soil by treating seed before planting with commercially prepared cultures of these organisms. Directions given on each container of the inoculant should be followed closely. Inoculated seed should be planted at once and not exposed to direct sunlight or high temperatures.

SUMMER LEGUME CULTIVARS

Perennials

Perennial Peanut (*Arachis glabrata*)

The perennial peanut is a persistent legume adapted to well-drained soils over the entire state. Three cultivars (varieties), Florigraze, Arbrook, and Ecoturf, are available. All are propagated from

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rhizomes or underground stems. Most plantings are made during the winter and early spring. Irrigation for 3 to 4 months after planting will help the new planting survive a spring drought. This crop is slow to establish and often requires 2 years to develop complete ground cover. The perennial peanut is best established in a clean seedbed and any perennial grass to be mixed with it should be planted later. To produce high quality hay, it should be grown in pure stands and not mixed with grass. Two or three cuttings per year are possible with total forage yields ranging from 3 to 6 tons/A in established stands. Frequent summer rainfall may interfere with hay harvest, but the crop can be stored as roll-bale silage. Forage quality is similar to that of alfalfa.

Carpon Desmodium (*Desmodium heterocarpon*)

This perennial legume will provide high quality pastures when grown in a mixture with the commonly used permanent grasses. It should not be grown in soil infested with rootknot nematodes (a large portion of the state) or in soils subject to sustained flooding of more than a week. The only recommended cultivar is Florida carpon desmodium.

Stylo (*Stylosanthes guianensis*)

Savanna Stylo, acts as a short-lived perennial in southern Florida and as an annual in northern Florida. Seedling growth is slow, and when planted in June, most of its growth will occur in late summer or early fall. In southern Florida, where it lives through the winter, production will be greater than where it grows as an annual. It will stay green and hold its leaves until frost.

Annuals

Alyceclover (*Alysicarpus vaginalis*)

Alyceclover grows upright with many branches and may reach 4 ft in height if not grazed. It should only be planted on sites that have good drainage. It can be planted from April 15 through June. It can be overseeded on grass pastures for grazing or planted on a prepared seedbed for hay or seed production. It is often planted following a spring watermelon or vegetable crop, with the intent of making one cutting

of hay. It is a high quality feed (over 15% protein in most situations) that is readily accepted by both grazing cattle and horses. The major use of alyceclover has been as a hay crop where it brings a market premium compared with bermudagrass. Alyceclover types (common alyceclover) currently available are susceptible to rootknot nematodes and should not be planted on sites known to be infested with this pest.

Hairy Indigo (*Indigofera hirsuta*)

A coarse-stemmed, erect forage legume, hairy indigo frequently reaches heights greater than 5 ft. Hairy indigo is the forage legume best adapted to low fertility, droughty sites. Hairy indigo has a crude protein concentration similar to that of alyceclover, but it is not as acceptable to cattle until they become accustomed to it. Cattle continuously grazing pure stands of hairy indigo during the summer rainy season may develop sores on their feet and legs. The cause of this problem has not been determined but has been associated with the hairs on the stems irritating the wet skin of cattle; however, such problems have not been reported in mixed pastures or where free choice between it and grass is available. Hairy indigo should be planted between April 1 and June 30. Hairy indigo is resistant to two of the three major species of rootknot nematodes in Florida and partially resistant to *Meloidogyne arenaria*.

Aeschynomene (*Aeschynomene americana*)

Common aeschynomene is a coarse-stemmed, semi-erect forage legume well-adapted to the wet flatwoods sites of Florida. Aeschynomene is the only widely grown summer forage legume capable of maintaining growth under flooded conditions. It frequently reaches heights of 3 or more feet, and the leaves are extremely high in nutritive value (20% crude protein and 70% digestibility). It significantly increases the quality of tropical grass pastures in late summer. Due to the coarseness of the stems, it is not recommended for hay. Aeschynomene has resistance to most rootknot nematodes. It can be planted from April through June whenever soil moisture is high.

Aeschynomene evenia is a new legume to Florida. There are no released cultivars, but a germplasm line is available to producers. Its

appearance is similar to that of *Aeschynomene americana*. It flowers and produces seed throughout the year. It remains green until frost. It is not as palatable as common *aeschynomene* and has a strong odor. As a result, cattle must become accustomed to it. It is unknown whether or not this legume improves animal performance. Research is needed to determine animal response.

Other Annuals

Cowpea, peanut, and soybean have all been used for forage, usually when seed harvest was not economical. Seed of phasey bean, a summer annual adapted to moist flatwoods, are available for planting in some years. Florida giant beggarweed also has been used for both grazing and high quality hay, but is more generally recognized as a weed.

PLANTING

Most summer legumes that are established from seed can be planted from April through June (Table 1). In years when winter rainfall is low, planting should be delayed until June when the summer rains start. Many stand failures have resulted from drought during April and May.

It is frequently desirable to seed summer legumes into an established grass sod. In such cases, it is not necessary to completely destroy the sod. Pasture drills (sod seeders, grain drills) can be used to seed directly into an undisturbed sod. The grass should be mowed, burned, or grazed closely prior to seeding. Bahiagrass sods may need to be disked prior to seeding. Introducing legumes into grass pastures increases the total tonnage of forage produced and improves forage quality.

When planting on a prepared seedbed, the soil should be thoroughly moist at the time of seeding. Seed should be planted with a cultipacker-type seeder, drill, or other appropriate seeding device, and given very shallow coverage. Packing is important as it gives a smooth, firm seedbed, presses seed into the soil and usually provides sufficient seed coverage.

LIMING

Have soil tested at least 2 and preferably 6 months before planting. Broadcast any recommended limestone 2 to 6 months before seeding forage legumes and incorporate it with the soil during seedbed preparation. Most soils used for forage legumes in Florida will require liming. A suitable pH range for summer legumes is of 5.5 to 6.0.

FERTILIZATION

Soil tests will indicate the kinds and amounts of fertilizer required. Nitrogen will not be needed, but on some soils both phosphorus and potassium may be required. Micronutrients are not normally deficient on land that has been previously fertilized or has been under cultivation for many years. Micronutrients, particularly copper, manganese, zinc, boron, and possibly other elements, may be needed on land where forages have not been planted previously.

Calcium will be adequate if the pH has been adjusted to the proper level. Sulfur and magnesium appear to be sufficient in most Florida soils, although magnesium may need to be added in some situations.

IRRIGATION

Rainfall distribution in Florida is such that drought is frequently a limiting factor in legume production. Irrigation is useful, especially in establishment of legumes, but it is often cost prohibitive. Installation and operation of an irrigation system is expensive and should be considered only in intensive forage production and management systems and after carefully estimating its economic feasibility.

MANAGEMENT AND UTILIZATION

Pasture

Legume pastures require intensive management if their full potential value is to be realized. Grazing of most varieties should be delayed until a plant height of more than 6" is achieved. This is usually 1 1/2 to 2 months after germination. Rotational grazing with several pasture divisions, each grazed for a short interval, and with enough cattle to permit some seed production while being grazed (from those legumes

that produce seed) is one of the most efficient methods of using legume pasture. Other methods used include limit grazing and creep grazing. Limit grazing gives cattle access to legume pastures for only a few hours each day to supplement their protein and energy requirements. Creep grazing has been utilized productively by some ranchers. Ideally, a small, intensively managed creep pasture would be located centrally to larger grass pastures. Access to the small pasture is restricted to only the calves and provides a much needed supplement for them.

Hay

Quality hay production from summer legumes requires intensive management and good timing. Quality hay can be put up only during 3- to 4-day periods with little or no rain. Many growers wait for dry weather in September to put up the annual legumes, but quality usually begins to decline in early September due to maturity. Perennial legumes like perennial peanut, must be cut more than once a summer. Hence, alternative harvesting methods (i.e., silage, greenchop, etc.) must be incorporated into the management program or some hay will be ruined by rain.

Table 1. Planting dates, seeding rates, and planting depths for summer forage legumes.

| Forage Crops Planted from Seed ¹ | Planting Dates | Seeding Rates ² | Planting Depths |
|---|---------------------------|----------------------------------|-----------------|
| Alyceclover | Apr 15 - Jun 30 | 12 - 15 | 1/4 - 1/2" |
| Aeschynomene | Mar 30 - Jun 30 | 6 - 8 (dehulled) | 1/4 - 1/2" |
| Cowpea | Apr 1 - Jul 31 | 100 - 120 (60 - 90) ³ | 1 - 3" |
| Desmodium, Florida carpon | Mar 30 - Jun 30 | 3 - 5 | 1/4 - 1/2" |
| Indigo, hairy | Apr 1 - Jun 30 | 6 - 8 | 1/4 - 1/2" |
| Perennial Peanut | Jan 15 - Mar 15 (or July) | 80+ bu (of rhizomes) | 2" |
| Phasey bean | Mar 30 - Jun 30 | 10 - 12 | 1/4 - 1/2" |
| Stylo | Feb 15 - Jun 30 | 10 - 12 | 1/4 - 1/2" |
| ¹ Always check seed quality (% germination, dormancy, weed seed, other crop seed, and trash). Seed germination should be 80% or higher for best results. ² Seeding rates: lb/A broadcast ³ Seeding rate: lb/A when planted in rows 30 to 36" wide, instead of broadcast. | | | |