

Forage Legumes for Texas 2022

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The successful use of forage legumes in Texas livestock production systems and as supplemental forages for Texas wildlife is influenced by: seasonal rainfall; competition with grasses and weeds; soil type; drainage; and ecoregion location.

Grasslands are primarily composed of grasses and legumes. Forbs and shrubs are also part of the grassland ecosystem on rangeland. Species in the grass and legume families are divided into annuals, perennials, and biennials and each of these categories is further divided into cool- and warm-season forages. Annuals germinate, grow, and mature in one growing season and therefore must be established from seed each year. Perennials have the ability to live more than one year under appropriate climatic conditions. They usually die back (go dormant) sometime during the year and then initiate new growth from roots, rhizomes, or stolons. Biennials require two growing seasons to complete their life cycle with the first season devoted to vegetative growth and flowering occurring in the second season. Warm-season forages begin growth in the spring and die or go dormant in the autumn with the first killing frost. Cool-season forages generally begin growth in autumn and mature or go dormant in late spring or early summer. A general description of each forage legume class and adaptability of each species and a list of varieties follows.

Cool-Season Annual Legumes

Cool-season annual legumes are the most extensively used legumes in the southeastern United States. They are usually overseeded on warm-season perennial grasses either alone or in mixtures with annual ryegrass. In addition to providing forage with high nutritive value during the spring they can add nitrogen to the pasture system through N₂-fixation in association with Rhizobium bacteria. Other benefits are spring weed control, nitrogen source for organic farming systems, and as supplemental forages for wildlife. They are more soil specific than grasses and generally require a minimum soil pH of 6.0. They must establish from seed each autumn but some of the

species have a high percentage of hard seed that permits volunteer reseeding if managed properly.

Annual Medics - The annual medics are a group of species belonging to the *Medicago* genus that are native to the Mediterranean region. They are annual relatives of alfalfa. Most species are best adapted to soils with a pH of 7 and higher and persist in lower rainfall areas than most clover species if rainfall occurs in late autumn and winter. Annual medics are more active winter growers than most annual clovers but most annual medic species also lack cold tolerance, which limits their northern adaptation. They produce small yellow flowers that mature into pods. Some of the species found in the United States form spines of various lengths and some do not. Individual plants may produce over a thousand seed pods.

Annual medics are dependable reseeder because they produce a high level of hard seed and have excellent seedling vigor. This excellent seedling vigor makes them one of the easiest winter annual legumes to establish. Annual medics can easily establish with a light disking, broadcast seeding, and then dragging the pasture to cover the seed. These hard seed can remain viable in the soil for several years. Annual medics do have a high bloat potential. However, this can be overcome by proper management of livestock and providing other forage to the grazing animals such as frosted mature grass, hay, or planting ryegrass with the medic.

Annual medics are excellent winter forages for domestic livestock and wildlife. One thing that makes medics well adapted as a grazing crop is that they generally have a prostrate growth habit and will flower and set a good seed crop even under heavy grazing pressure. Most commercial varieties in the world have been developed in Australia, and as a general rule, most Australian varieties lack winter hardiness needed to persist in Texas.

Burr medic, or burr clover, (*M. polymorpha*) was introduced sometime in the ninetieth century and has become naturalized in South Texas and the West Coast. 'Armadillo' burr medic, was selected from a naturalized ecotype in South Texas, and was released by the Texas Agricultural Experiment Station at Beeville in 1998. Armadillo is adapted south of I-20 in Central and South Texas. Recommended seeding rates are 5 to 10 lbs per acre. Armadillo does well when grown with bermudagrass and kleingrass providing the perennial grasses are managed to be grazed short in the autumn to allow the seedlings to establish.

Barrel medic (*M. truncatula*) is less winter hardy than Armadillo burr medic, but some Australian varieties perform well in South Texas. The barrel medics are somewhat better adapted to the high pH sandy soils of Central and South Texas than Armadillo burr medic. The old variety 'Jemalong' has been recommended in South Texas for 10 or more years. There is a new cultivar, 'Jester', that was selected out of Jemalong and it has been performing nearly like Jemalong. Jester and Jemalong mature about 2 weeks later than Armadillo and is recommended from about Austin southward. Another cultivar that is only recommended in deep South Texas is Parabinga. Parabinga is a very active winter grower and matures 2 weeks before Armadillo, so has performed well in the hot drier areas of deep South Texas. Recommended seeding rates on barrel medic are similar to Armadillo.

Spotted burr medic (*M. arabica*) is more cold tolerant, better adapted to sandy soils that are slightly acid than most other medics. At the present time there are no commercial varieties available.

Black medic (*M. lupulina*) is common from South Texas north to Canada. It is the predominant annual medic on much of the blackland soils of Texas. Black medic develops a smooth black cluster of pods with normally only one seed per pod. The only commercial varieties currently available are not well adapted to Texas as they were developed for more northern regions. However, if you have a naturalized stand of black medic, it can be encouraged to contribute to your winter and spring forage base if you manage to allow it to reestablish itself in the autumn.

Button medic (*M. orbicularis*) has a large flat smooth pod and is best adapted to the north central Texas. 'Estes' button medic is currently being marketed for North Central Texas. A problem that is unique to this species is that the pod is very large and fleshy, and it is highly palatable to deer. Nearly complete removal of all pods has been observed when using this legume in deer food plots.

Little burr medic (*M. minima*) has become naturalized in the Texas Hill Country and have smaller leaves and smaller seed than most medics. The pods have long spines and the plant is very pubescent. Devine little burr medic was released in 2005 by Texas Agricultural Experiment Station at Beeville. Devine originated from a kleingrass pasture near Devine, TX, and is best adapted in the I-35 corridor from south of San Antonio to nearly the Oklahoma border. Recommended seeding rates are 3 to 5 lbs per acre. Devine grows well with most perennial grasses provided the grasses are managed to be grazed short in the autumn to allow the seedlings to establish.

Arrowleaf clover (*Trifolium vesiculosum* Savi) is one of the major annual clover species grown in the southeastern U.S. It has large white flowers with a pinkish cast and can grow over 4 ft tall if not grazed or cut. Arrowleaf clover is best adapted to well drained loam and sandy soils but is more sensitive to soil pH than other legumes with a preference of 6.5 to 7 pH. Iron chlorosis can be a problem on soils with a pH above 7.5. Arrowleaf clover is the latest maturing, and usually the highest yielding annual clover with growth continuing through June if moisture is adequate. Seedling growth is slow with seedlings staying in a rosette stage until late February. This results in very little forage production until early March. Arrowleaf clover has excellent reseeding potential with up to 90% hard seed. Volunteer stands may be poor the first reseeding year because of the low percentage of soft seed. Only scarified seed should be planted at 8 to 10 lb/acre. Planting an additional 4 to 5 lb/acre of scarified seed the first reseeding year will ensure that an adequate amount of soft seed is present to obtain a good stand.

Virus diseases are a major problem with older varieties like Yuchi. Leaves of affected plants will be crinkled, have a light and dark green mosaic pattern, and a chlorotic appearance. Root rots have also been a problem. Early symptoms are poor stands in the autumn because of seedling loss. Surviving plants will do poorly during the winter because of root damage and may die when grazing begins. Leaves of arrowleaf clover may turn red because of stress due to disease, low temperatures, or other environmental factors. Early planting from mid-September to

mid-October has also improved seedling survival against these diseases. 'Apache' arrowleaf released in 2001 has tolerance to bean yellow mosaic virus disease. 'Blackhawk' arrowleaf clover was released in 2012 and is tolerant to both bean yellow mosaic virus and fungal seedling diseases. Both Apache and Blackhawk are recommended varieties.

Ball clover (*Trifolium nigrescens* Viv.) has small ovate leaflets and small white to yellowish-white flowers. If not cut or grazed, stems can grow up to 3 feet and are prostrate to partially erect, often forming a thick mat. This prevents using ball clover for hay and makes harvesting seed difficult unless it is grazed before flowering. Seed are very small (approximately 1,000,000 per lb) with a recommended seeding rate of only 2 to 3 lb/acre. Ball clover does best on loam and clay soils but has done well on relatively level sandy soils near creek or river bottoms that maintain good soil moisture. It does not have good drought tolerance and growth will be reduced in a hot, dry spring. It prefers a soil pH of 6 or higher. Ball clover can tolerate wet soils but not as well as white clover. It is medium maturity, flowering about a month later than crimson with yields usually slightly less than crimson.

Ball clover has excellent reseeding. Hard seed content is about 60% and it will produce some flowers even under close grazing. Ball clover does have a high bloat potential and should be managed accordingly. Since there are no commercial varieties at this time only common ball clover seed is available.

Berseem clover (*Trifolium alexandrinum* L.) also called Egyptian clover, is believed to have originated in Syria. It was introduced into the Nile Valley in Egypt in the 6th Century and is now grown on half the cultivated land in that country as a winter cover and green manure crop. It has oblong leaflets, hollow stems, large white flowers, and can grow up to 2.5 ft. tall. Berseem clover is not as cold tolerant as the other annual clovers. Bigbee berseem, a joint release by the USDA and the Mississippi Agricultural and Forestry Experiment Station in 1984, has improved cold tolerance. However, even Bigbee berseem is considered less cold hardy than most of the other annual clover species.

Berseem clover is well adapted to river bottoms and clay soils with a pH of 6 to 8. Berseem clover has medium size seed with 207,000 seed/lb. Recommended seeding rate is 12 to 16 lb/acre. Bigbee berseem has excellent seedling vigor with growth 8 to 10 inches tall by December if planted on a prepared seedbed in late September or early October along the Gulf Coast. Grazing should begin when it is 6 to 8 inches tall to stimulate tillering and limit frost damage. Bigbee berseem clover begins flowering in late April. It does well under irrigation in southern California. Bloat potential of berseem clover is low but animal losses due to bloat have been reported. It lacks hard seed and therefore is a poor reseed. Berseem clover has poor drought tolerance.

Crimson clover (*Trifolium incarnatum* L.) is native to Europe and is the most widely adapted annual clover species grown in the southeastern United States. It has scarlet or deep red flowers and is used extensively for roadside stabilization and beautification throughout the southeastern United States. Crimson clover grows on soils ranging from sands to well-drained clay soils with a pH of 5.5 to 7. Best growth occurs at a pH of 6 to 7. Iron chlorosis has been a problem on calcareous soils at a pH of 7.3 or higher. Recommended seeding rate is 16 to 20 lb/acre.

Crimson clover is one of the larger seeded annual clovers with 150,000 seed/lb and has excellent seedling vigor. If planted early, it can produce some forage in the autumn and has earlier forage production in the spring than the other clover species. However, winter temperatures about 15°F or lower have caused some top kill that will reduce early spring growth.

Crimson clover is the earliest maturing annual clover. The combination of good seedling vigor and early maturity makes it ideal for overseeding warm-season perennial grasses. Present crimson clover varieties are considered poor reseeder because hard seed levels are only about 10%. Most soft seed germinate with the first rain after seed matures in May. Range in maturity of present varieties is about 12 days. Flame and AU Robin are early varieties and Tibbee and Dixie are late varieties.

Persian clover (*Trifolium resupinatum* L.) is native to Asia Minor and the Mediterranean region. The actual time of introduction into the United States is not known, but it was found growing in Wilcox County, Alabama in 1923. Common Persian clover has small leaves and reaches a height of 8 to 12 in. with small, light purple flowers. It is found on loam and clay soils, especially on poorly drained soils with soil pH of 6 to 8. Seedling growth is best at a pH of 7 to 8. Persian clover spreads during flooding because the calyx swells at seed maturity and serves as a float, allowing the seed to move to other flooded areas. It does have high bloat potential. Recommended seeding rate is 6 to 8 lb/acre. The seed are small with 600,000 seed/lb. The only available varieties are from Australia.

Rose clover (*Trifolium hirtum* All.) is native to the Mediterranean region and Asia Minor and is one of the few clover species that is adapted to lower rainfall areas. Most of the rose clover acreage is on the California rangelands that receive at least 10 in. of rain during the winter growing season. Overton R18 was selected for climatic and soil conditions in the southeastern US at the Texas A&M University Agricultural Research and Extension Center at Overton. It matures 4 weeks later with twice the production compared to the early varieties grown in California and Australia. Rose clover is adapted to all soil types with a pH of 5.5 or higher but does not tolerate poorly drained soils. Some iron chlorosis problems have been reported on calcareous soils with soil pH near 8.0. Optimum pH for seedling growth is 5.5 to 7.0. Recommended seeding rates are 12 to 16 lb/acre. Rose clover has a medium size seed with 164,000 seed/lb. Poor seedling growth and nodulation is a major limitation of rose clover that results in later spring growth than the other legume species.

Its greatest success has been in North Central Texas and Central Oklahoma where the annual rainfall is 25 to 30 in., which limits the growth of most other clovers. The good drought tolerance is due to a deep rooting depth. Rose clover is an excellent reseeder because of a hard seed percentage of 90%. California data have shown that if volunteer clover stands are lost to drought or insects several years in a row, there would still be sufficient hard seed remaining to reestablish the rose clover stand.

Subterranean clover, also called subclover, is native to the Mediterranean region. Subterranean clover is the common name for three *Trifolium* species, *subterraneum*, *brachycalcycinum*, and *yannanicum*. Most varieties grown in the United States are *subterraneum* species. Subclover is best adapted to soils ranging from a fine sandy loam to clay with a pH from 5.5 to 7. Like

arrowleaf, it usually becomes chlorotic and stunted on soils with a pH above 7.3. The brachycalycinum species of subterranean clover is adapted to soil pH's above 7.0 but has less cold tolerance. Subclover has a low growth habit which forms a dense sod that seldom exceeds a 10-in. height. Its short height is deceiving. Forage yield of a 5- to 6-in. high subclover pasture is similar to a 12-in. high arrowleaf clover pasture. Reseeding of subterranean clover is generally poor in Texas.

Annual Sweetclover (*Melilotus alba* Medik.) is not a true clover but is an excellent forage legume. At one time, it was the most widely grown forage legume in the United States. It is one of the most drought-tolerant legumes and was grown for forage and soil improvement, particularly in the Great Plains and the Corn Belt. Sweetclover will grow almost anywhere there is a minimum of about 17 in. of rainfall and soil pH is 7.0 or higher. The three general cultivated types of sweetclover are biennial yellow flower, biennial white flower, and annual white flower. Hubam and Floranna are annual white flower types that were grown in the southern USA. In the late 1940's and early 1950's, over 9 million pounds of sweetclover seed were produced in Texas annually. The advent of cheap nitrogen fertilizer after World War II and the spread of the sweetclover weevil (*Sitona cylindricollis*) eliminated most of the sweetclover acreage in the United States. However, it is still grown in Canada. Both white and yellow flower types are found growing along roadsides throughout the United States.

Sweetclover can be planted in the southern states in October at 12 to 16 lb seed/acre. Successful stands have been obtained in Central Texas when seeded in late January and February. It has a medium seed size with approximately 260,000 seed/lb. Sweetclover plants are 3 to 7 feet tall at maturity depending on variety. Annual sweetclovers are late maturing, flowering from May through June in the southern United States. Sweetclovers contain coumarin that causes a bitter taste to which animals become accustomed. If sweetclover is baled at too high a moisture level and fungal molds develop, the coumarin changes to dicoumarol, a blood anticoagulant. Cows eating the moldy hay can die of internal bleeding. Dicoumarol is not a problem when sweetclover is grazed by cattle or browsed by deer. Dicoumarol can cause toxicity problems only when high coumarin sweetclover is consumed as moldy hay or silage.

Genes for low coumarin have been found in a wild sweetclover type but none of the annual sweetclover varieties contain the low coumarin gene. A breeding program has been initiated at Texas A&M University Agricultural Research and Extension Center at Overton to transfer the low coumarin gene to annual sweetclover. Seed increases and evaluations of low coumarin experimental cultivars are in progress.

Silver River is a new, rust resistant cultivar of white-flowered, annual sweetclover (*Melilotus albus* Medik.) developed by Texas A&M AgriLife Research at Overton with excellent adaptation to south and central Texas. Sweetclover rust (*Uromyces striatus* Schroet.) causes a range of plant disease symptoms, including leaf drop, reduced seed and forage yield, and premature plant death. The evaluation of Silver River for rust resistance was conducted at Beeville, TX under severe epiphytotic of sweetclover rust. Two cycles of mass selection at Beeville were used to improve the rust resistance of a sweetclover plant introduction line from Uruguay. The original plant introduction population had 21% rust resistant plants. Silver River averaged 91% resistant

plants at Beeville in 2014 and 2015, compared to 'Hubam' with a 2-year average of 7% resistance. Silver River is similar to Hubam in forage yield and maturity. This new cultivar will improve the reliability of annual sweetclover in cattle grazing systems and wildlife supplemental forage plantings in south and central Texas. Silver River was released in 2016.

Vetch (Vicia) There are many different species of vetch including 15 that are native to the US. Cold-hardy vetch species such as hairy vetch are adapted over a wide area of the US. Common vetch is less cold-hardy and is limited to areas with mild winters such as the Gulf Coast area. Vetch is adapted to a wider range of soil types and pH's than most other forage legumes. It grows on sand, loam, and clay soils from pH 5 to 8. It also has excellent seedling vigor because of its large seed. There are approximately 16,000 seed/lb for hairy vetch with a recommended seeding rate of 20 to 25 lb/acre. Optimum planting depth is 1 to 2 inches because of the large seed. Stems bear leaves with pinnate leaflets and terminate in tendrils that attach themselves to stems of other plants. White or purple flowers, depending on the species, are borne in a cluster or raceme. Hairy vetch flowers during April and May. Seed and pod characteristics vary with species.

The main use for vetch is for a green manure crop because it maintains a high nitrogen concentration through plant maturity. A mature crop of hairy vetch will contain about 150 lb nitrogen/acre. Vetch does not tolerate close grazing and should not be grazed shorter than 6 in. Insects are the main disadvantage of vetch. Pea aphids, corn earworm, fall armyworm and spider mites can be problems. The vetch bruchid or weevil destroys the interior of the seed reducing seed yields, which is the main reason for poor reseeding.

Austrian Winter Peas (*Pisum sativum*) may produce a moderate amount of dry matter used for grazing, as a hay crop, or as a green manure. Winter peas are often used as companion crops with cereal grains and are high in nutritive value. Winter peas are easily established on well-drained loam or sandy loam soils and should be planted during September or October at 20 to 30 lbs of seed/acre in mixed stands with cereal grains or ryegrass and 30-40 lbs/acre in pure stands. Austrian winter peas are adapted to low pH soils.

Cool-Season Perennial Legumes

A few cool-season perennial legume species are grown in the southern United States. Their acreage in the southern United States is limited by preference for loam and clay loam soils. Perennial clovers often act like annuals in this region because of poor summer survival.

Alfalfa (*Medicago sativa* L.) is the best-known forage legume in the United States and is referred to as the "Queen of the Forages". It is the only forage known to have been cultivated before the era of recorded history. Although classified as a cool-season legume, it grows throughout the summer if moisture is available. Because of this long growing season it has the capacity to produce large yields of high quality forage. It is best adapted and grown most extensively in the mid-west US. However, varieties have been developed that are adapted to most climates throughout the United States.

Alfalfa does best on deep, well-drained loam to clay loam soils with a pH of 7.0 or higher. In the eastern half of Texas, the optimum sites are well-drained river bottoms of the Brazos, Colorado, and Red Rivers. Alfalfa can be grown on any soil with good internal drainage and a subsoil pH of 5.5 or higher. Lime can be added to raise the surface soil pH to near 7 and nutrients limiting for optimum growth can be applied. When sandy acid soils are limed to pH 7, boron is critical for alfalfa if soil boron is less than 1.0 ppm. Autumn planting dates are preferred over spring because of fewer weed problems. Recommended seeding rates are 16 to 20 lb/acre planted at ¼ in. depth in clay soils to ½ in. depth in sandy soils in a clean, firm seedbed.

Alfalfa can be a very profitable forage crop, but it requires a high level of management. Chemical weed control is required to obtain good clean stands. Most disease problems have been solved by selecting for resistance. Alfalfa weevil and three-cornered alfalfa hopper are the main insect problems but all can be controlled with insecticides. Its primary use is hay for dairy cows and horses. With the development of grazing tolerant varieties, more alfalfa is being used for grazing.

Red clover (*Trifolium pretense* L.) is a weak perennial with stands lasting 2 to 3 years in the northern 2/3 of the United States but usually only 1 year in the Lower South (35° N latitude southward). Red clover is best adapted where summer temperatures are moderately cool to warm with good soil moisture conditions. It prefers loam to clay loam soils as long as they are well drained. It will grow on flat sandy soils (flatwoods) with good moisture. Soil pH needs to be above 6. In the South, red clover reaches a height of 2 to 2.5 ft. with numerous leafy stems rising from the crown. Hairs are present on both leaves and stems. Flower color varies from light pink to rose purple to magenta. It has a tap root that gives it some drought tolerance on loam soils but red clover is sensitive to low soil moisture on sandy soils.

Recommended seeding rate is 10 to 12 lb/acre planted at a ¼ to ½ in. depth. Red clover will grow into June and July if moisture is available. Cherokee red clover is the only variety developed in the South so it begins spring growth earlier than other varieties. Red clover can be used for both hay and grazing but does not tolerate close grazing.

White clover (*Trifolium repens* L.) is a perennial legume grown in the eastern half of the US. While perennial in nature, white clover in the southeastern US generally persists as a re-seeding annual. There are small, medium, and large (ladino) white clover types. Although a shorter stature, short and medium types are better seed producers than large types, which is important for reseeding in the south. Recommended varieties are Louisiana S-1, Neches and Durana. White clover requires good soil moisture, is usually found on clay loam, bottomland soils, and is not productive under droughty, upland conditions.

White clover is often planted at 3-4 lbs/acre into existing tall fescue or bermudagrass stands. Best production will be obtained on fertile, well-drained soils if rainfall is favorable. White clover will tolerate wet soil conditions better than most legume species. Because it is often found on wetter sites, white clover may survive a drought during the summer months better than other forage legumes.

White clover does not exhibit the same erect growth habit as red clover and mixed grass-clover stands should be grazed at a 4 to 6 inch height to prevent competition for sunlight from becoming a limiting factor in white clover production. When cattle graze pure stands of white clover, bloat potential may be reduced using Bloat Guard blocks, feeding grass hay or grown in grass mixtures.

Warm-Season Annual Legumes

Both annual and perennial warm-season legumes are used more for wildlife than livestock. It is difficult to grow warm-season legumes in association with warm-season perennial grasses because the warm-season grasses are so well adapted and competitive.

Cowpea (*Vigna unguiculata*) is an annual viney plant with large leaves. The species is fairly tolerant of drought, heat, low fertility, and moderate soil acidity. Cowpeas, however, do require adequate levels of P and K to be productive. Forage nutritive value is generally high and plants are easily established from May through June. Many times cowpeas are used as a warm-season food plot for white-tailed deer to offset the negative effects of summer stress. Cowpeas do not cause bloat in ruminants, but are not found immediately palatable by cattle.

‘Ace’ is a small seeded (9000 seed/lb) cultivar of forage cowpea developed for use in wildlife supplemental plantings, cover cropping systems and legume hay production. Ace was developed in the Texas A&M AgriLife Research Forage Legume Breeding Program at Overton and released in May 2018. Ace was evaluated at Texas A&M AgriLife RECs at Overton and Vernon, TX. Ace has full season forage production and flowers in late August.

‘Iron & Clay’ is an old forage-type cowpea cultivar (technically a variety mix) that remains vegetative during most of the summer and flowers in mid September. Both Ace and Iron & Clay are recommended for Texas.

Lablab (*Lablab purpureus* [L.] Sweet) is a vining, annual tropical legume with high nutritive value as a forage for cattle and goats and browse for deer. The qualities of this tropical forage include: drought tolerance, high palatability, high nutritive value, excellent forage yields and adaptation to diverse environmental conditions.

Currently, seed of the Australian lablab cultivar ‘Rongai’ is imported into the US primarily for supplemental forage plantings for white-tailed deer. Rongai was released by the New South Wales Department of Agriculture in 1962. Rongai is very late maturing and generally does not flower in northeast Texas before frost.

‘Rio Verde’ lablab was developed through selection for tolerance to defoliation, forage production potential and Texas seed production. Rio Verde was developed at the Texas A&M University Agricultural Research and Extension Center at Overton, Texas and released by the Texas Agricultural Experiment Station (TAES) in 2006. Rio Verde was the first lablab cultivar developed in the US. Currently (2020) no Rio Verde seed are produced in Texas due to anthracnose disease in west Texas seed production areas. Texas A&M AgriLife Research at

Overton has identified resistance in lablab to this foliar and stem blight but new cultivars are still in evaluations.

Soybean (*Glycine max*) is a temperate grain legume that can be used as a grazing and hay crop. This plant is not as tolerant of heat and drought as cowpea and lablab and does not regrow well after defoliation. Soybean is better adapted to heavy clay soils and wet soils relative to cowpea and lablab. There are forage type soybean varieties that require short days (late fall) to flower and mature. They remain in a vegetative stage during the summer in contrast to grain-type soybeans that begin to flower 2 to 3 months after planting. 'Tyrone' is the best adapted forage soybean variety for the southern states.

Warm-Season Perennial Legumes

Bundleflower: There are several species of bundleflower (*Desmanthus*) that are native to Texas and surrounding states. Two species have been commercialized for use in Texas. 'Sabine' Illinois bundleflower (*Desmanthus illinoensis*) is adapted to North and Central Texas from about Austin northward. 'BeeWild' bundleflower (*D. bicornutus*) was developed at Beeville and released by the Texas Agricultural Experiment Station in 2003. BeeWild consists of four (4) different cultivars that are produced as monocultures for seed production purposes, and then blended to produce BeeWild. The four different cultivars have a 100% range in seed size, and a broad range in flowering and seed maturation time. BeeWild is best adapted south of about Waco in Central Texas. All bundleflowers are poorly adapted to acid sandy soils, so their use is restricted to soils that are sandy clay loams and heavier with a pH near neutral and above. All bundleflowers contain tannin which reduces palatability and essentially eliminates the potential for bloat. Recommended seeding rates for bundleflower is 3 to 5 lbs per acre.

More Information

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