

## ESTABLISHMENT AND MANAGEMENT OF APACHE ARROWLEAF CLOVER

G. R. Smith and F. M. Rouquette, Jr.

**Background.** Healthy stands of arrowleaf clover can provide high quality cool-season grazing for beef and dairy cattle in east Texas and all across the southeastern U.S. Arrowleaf clover was introduced into Texas pasture systems in the early 1970's and probably peaked in use in the mid 1980's. This clover can be a wonderful component of cool-season pastures either planted alone or in combination with ryegrass, rye and crimson clover. Arrowleaf is often sod-seeded into warm-season perennial grass pastures to provide early spring forage production when the warm-season grasses are dormant. Arrowleaf is one of our most productive annual clovers and can be managed for reliable reseeding. However, maintaining healthy arrowleaf clover has been an increasing problem for the last 20 to 25 years.

Virus diseases and fungal root and crown rots cause severe damage on the old standard arrowleaf clover varieties (Yuchi, Meechee, and Amclo). The most visible and obvious disease symptom is early death due to infection with multiple pathogens. Arrowleaf clover should be very productive through at least late May and often into early June in the Southeastern U. S. When diseases hit these susceptible varieties, there is usually no forage regrowth after the initial grazing in March or April.

Apache arrowleaf clover was developed in response to the need for disease resistance in this important clover. Apache was developed at the Texas A&M University Agricultural Research and Extension Center at Overton and released by TAES as a new cultivar in 2001.

**Current Information.** Apache is resistant to bean yellow mosaic virus (BYMV) lethal wilt and has a less severe response (tolerance) to other symptoms of BYMV such as stunting, yellowing and leaf deformation. Apache has not shown the early death syndrome that is common with Yuchi arrowleaf clover. Apache is not resistant to all arrowleaf clover diseases, and there are viruses other than BYMV and fungal diseases that can cause problems in arrowleaf clover. Research continues in the TAES Clover Breeding Program to improve disease resistance in arrowleaf clover.

Apache is earlier in both forage production and flowering compared to Yuchi. In the past, mixtures of arrowleaf and crimson clover were planted to assure clover forage production from March through early June. Apache arrowleaf clover is more productive in March than Yuchi arrowleaf and in some years is equal to forage production from crimson clover. Sod-seeded Apache arrowleaf provided grazing from March 6 through June 10, 2003 in research conducted at Overton. Additional research is needed to determine if pure stands of Apache

arrowleaf can provide the same early spring forage production that we expect from crimson clover in east Texas.

Apache flowers about 10 days earlier than Yuchi and reaches 50% bloom by about mid-May. This maturity difference reduces the potential for late spring competition of Apache with warm-season grasses compared to Yuchi. Apache produces hard seed and can be managed for reseeding. For optimum reseeding of Apache, grazing should be terminated in early May, and deferred until seed are mature (mid to late June). At seed maturity, a hay harvest should be taken to remove excess forage and allow recovery of the warm-season grass. Hay harvested in this manner is usually rich in seed and distribution of hay in selected feeding areas serves to establish clover in areas that may otherwise not be planted.

Overseeding of Apache arrowleaf into warm-season perennial grass sods is not difficult but does require advance planning. Start by evaluating lime and fertilizer requirements with a soil test no later than March or April of the establishment year. If soils are sandy in texture a boron analysis should be part of the soil test. Apply super fine (ECCE 100) lime according to soil test in the spring. This will allow 6 months for the lime to cause a soil pH change before fall planting. Pastures should be grazed or hayed to a two-inch stubble in preparation for planting. Apply fertilizer according to soil test recommendations and lightly disk prior to planting in early to mid October. Broadcast or drill 10 lbs per acre of Apache arrowleaf seed. The seed should not be planted deeper than one-half inch if using a drill. Seed that are broadcast should be covered using a harrow or some type of drag. The objective is to place the seed in contact with the soil. Apache arrowleaf is generally sold as preinoculated seed to insure a precise match of clover species and *Rhizobium* inoculant. If you buy Apache as raw seed, be sure to purchase *Rhizobium* inoculant that is specific for arrowleaf clover (arrowleaf clover should be printed on the package label) and inoculate the seed according to the instructions on the inoculant package.

**Recommendation.** Apache arrowleaf clover is the best annual clover choice for east Texas upland sandy acid soils. Apache is a better choice than Yuchi because the virus disease tolerance of Apache improves the reliability of the clover stand. Also, Apache arrowleaf is earlier in spring forage production compared to Yuchi.