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# EVALUATION OF RESEEDING WINTER ANNUAL MEDICS FOR SOUTH TEXAS

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## Summary

Commercial varieties of barrel medic (*Medicago truncatula*) from Australia have been used in South Texas for 6 to 8 years because they are more persistent than most annual clovers (*Trifolium* spp.). Further, annual medics are more productive than most annual clovers in midwinter. However, commercial varieties of barrel medic lack the attributes required for long-term persistence. 'Jemalong' barrel medic has been used longer than any other barrel medic and is still being recommended. In 1994, we collected seed of naturalized burr medic (*M. polymorpha*) from Central and South Texas with the objective of releasing a persistent, winter-growing variety. This paper summarizes the results of several experiments, and indicates that a burr medic collection from TAES-Beeville may be the basis for a new variety release in the near future.

## Introduction

Winter annual legumes have been evaluated in numerous tests in South Texas (Holt and Moore, 1983; Ocumpaugh, 1987; Grichar et al., 1995). Several varieties of various species will produce 2 to 3 tons/acre of dry matter, but nearly all require annual replanting. Research conducted at TAES-Beeville in the mid-1980s demonstrated that annual clovers and annual medics can be used in pasture systems to provide all or nearly all the nitrogen required for the associated grass (Ocumpaugh, 1990). This 4-year grazing trial with clover overseeded on 'Coastal' bermudagrass (*Cynodon dactylon*) produced year-long grazing equivalent to two 50-lbs/acre applications of nitrogen fertilizer. Further, we could not document any negative effects on bermudagrass stand or animal carrying capacity due to overseeding clover. In most years, animal performance (average daily gain) was increased during the spring. Unfortunately, we had to seed these pastures 3 out of 4 years.

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The only clover to consistently reseed in South Texas is rose clover (*T. hirtum*) (Ocumpaugh and Rahmes, 1995). Unfortunately, rose clover produces little grazable forage until forage in the midwinter period. Burr medic, also known as burr clover, was introduced into the region at least 75 years ago and has become naturalized. A commercial variety of burr medic was released in Texas in the 1950s (Anonymous, 1956), but seed is no longer available. Attempts to use burr medics developed and produced commercially in Australia show little promise; however, we have had some success with Australian varieties of barrel medics.

Jemalong barrel medic was identified several years ago as a reseeding winter legume for South Texas. Jemalong was planted in the fall of 1983 and had the least cold damage of all Australian medics evaluated when temperatures fell to 9°F in December. When compared to true clovers, Jemalong produces more forage in January and February than any clover, except 'Bigbee' burseem (*T. alexandrinum*) which does not reseed and is very sensitive to drought. Jemalong is still being used, but lacks the attributes required for long-term persistence. Jemalong is an old Australian variety and several new barrel medic varieties have been released. Further, in the spring of 1994, we collected several naturalized burr medics in Texas for evaluation as potential variety releases. In the fall of 1994, we established a number of experiments in South Texas to evaluate total yield, yield distribution, natural reseeding (stand), natural regrowth (production), and winter freeze damage of barrel and burr medics.

### Procedures

Barrel medics evaluated included Jemalong, 'Parabinga', 'Caliph', 'Mogul', 'Paraggio', and 'Borong'. We had sufficient seed of three naturalized burr medics—"TAES-Beeville (Pasture 18)", "Goliad County", and "College Station"—for direct evaluation. 'Overton R18' rose clover was included as a comparison. Yield, reseeding, and freeze damage data were taken from replicated plots at TAES-Beeville and TAES-Yoakum. Hardseededness data was from spaced plants at Beeville and College Station, and from potted plants in the greenhouse at Beeville. The soils were sandy clay loam at Beeville, clay loam at Yoakum, and silt loam at College Station. The pH at all sites was above 7.8, and 40 to 50 lbs/acre of P<sub>2</sub>O<sub>5</sub> was applied before planting in the fall of 1994. Data were summarized and will be presented in comparison to Jemalong barrel medic.

## Results and Discussion

**First Year Yield.** Jemalong has been planted in numerous tests at TAES-Beeville over the years since 1983, and dry matter yields have generally been in the 4000 to 5000 lbs/acre range. Jemalong produced comparable yields in 1994-95. Most of the barrel medic varieties produced total dry matter yields comparable to that of Jemalong. The early maturing varieties, Parabinga and Caliph, were more productive in early February and less productive in April than Jemalong. Paraggio, a late maturing variety, produced slightly more dry matter in April, but was similar to Jemalong in the early harvests. The naturalized burr medic collections produced 70% to 85% of the yield of Jemalong in February, but produced about the same total yield as Jemalong. Overton R18 rose clover produced only 6% to 21% of the yield of Jemalong in February and early March, but total yield was similar to Jemalong.

**Evaluation of Reseeding Stands.** Reseeding stands of all medics were good except for Borung barrel medic. Reseeding stands of Overton R-18 rose clover were poor due to our clipping management, but are usually excellent (Ocumpaugh and Rahmes, 1995). Numerous observations of pasture plantings over the years indicate Jemalong and Parabinga are good natural reseeder, but none spread far from their original planted area. Rose clover (Ocumpaugh and Rahmes, 1995) and naturalized burr medics tend to spread and dominate adjacent areas.

Fall growth of naturally reseeding stands of medics were good to excellent for all but Borung barrel medic, with the burr medic collection from TAES-Beeville and Mogul barrel medic having the highest amount of growth. If rainfall had not been limiting in the fall of 1995, the medics would have provided grazable forage by mid-December.

Freeze damage ratings were assigned on 12 January 1996, following a 22°F freeze on 8 January 1996. Using a scale of 0 to 9; with 0 = no damage and 9 = very severe top damage, Jemalong scored 2 to 3. All other barrel medics scored 5 to 8 with little difference among varieties. The burr medics scored 0 to 2 with no difference among collections. As expected, Overton R18 rose clover sustained no freeze damage.

Hand-harvested and hand-cleaned seed produced in the field at Beeville and College Station and in the greenhouse at Beeville were evaluated for hard seed content. Barrel medics produce less hard seed (35% to 50% hard) than the burr medics (85% to 99% hard). Jemalong tended to have higher hard seed than the other barrel medics evaluated. The hard seed content

in Overton R18 rose clover is in the 80% to 90% range. High levels of hard seed are essential for long-term persistence in pastures.

Based on the data summarized above and other supporting studies, we have selected the burr medic from pasture 18 at TAES-Beeville as the "best of the collection" for further evaluation. This population has shown long-term persistence in the pastures at TAES-Beeville, has excellent hard seed content, shows superior tissue tolerance to freezing temperatures, and is nearly as productive as any winter legume we can consistently grow.

The technology to produce, harvest, and clean burr clover seed has been developed in Australia. To economically harvest and clean the seed will require specialized equipment. Seed burrs can be harvested with a flail harvester, but this process also collects all the straw which must be removed from the burrs. Alternately, burrs and straw can be distributed onto pasture shortly after harvest as a crude method of distributing seed from one field to another.

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