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FORAGE AND BEEF CATTLE RESEARCH

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Abstract: This report describes the results of a study conducted at the Texas A&M University Agricultural Experiment Station and does not imply approval or disapproval of the product or process described. The product or process described may be patented.

## EVALUATION OF ANNUAL CLOVERS FOR EAST TEXAS

E. R. Shipe and F. M. Rouquette, Jr.

### SUMMARY

Four hundred and twenty-three genetically diverse annual clover Plant Introductions were evaluated for adaptation and agronomic potential at Overton during 1976-77. Seed was harvested from 52 different types for further evaluation. These lines were rated against each other in 1978-79. Plant Introductions within the following three species appear to have some potential for future testing and development: Trifolium dasyurum, T. diffusum, and T. hirtum.

### OBJECTIVE

The objective of this research was to evaluate various annual clover species for adaptation to East Texas environmental conditions and identify types having potential for future development through a breeding program.

### PROCEDURES

Fifty-two different Trifolium genotypes were seeded November 7, 1978, in 4 x 10 ft. plots on a deep, fine sandy loam soil. There were 10 Tri-folium species and numerous types in each species (Table 1). Fertilizer was applied pre-plant at the rate of 24-96-96 of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, respectively. Seeding rate varied depending on species and seed size. All species and several different types within some species were rated for the following characteristics: stand, winter hardiness, pest resistance, and available forage. Available forage was used as an estimate of yield potential under grazing. The clovers were rated for these characteristics on January 22, March 5, April 12, and May 8, 1979. All characteristics except available forage were ranked on a scale of 1 to 5 with 1 being best and 5 being poorest. Available forage was ranked on a scale of 1 to 10. Ratings were made by two observers and the final score for each characteristic was an average of the two observations. An overall composite score was determined by averaging stand and available forage ratings and converting to a 1-5 scale. The mean and standard deviation were calculated for the composite rating.

## RESULTS

Dry weather resulting in low available soil moisture during October delayed planting until early November. The clovers made little growth before the onset of low temperatures late in the month. The most rapid growth was observed from February to late May. None of the T. resupinatum entries (Table 1) performed well, especially with regard to stand establishment. A comparison of entries was made based on their composite scores (low scores are best). Clovers having composite scores  $<1$  S.D. below the mean are shown in Table 2. Based on the 1978-79 evaluation, entries of T. dasyurum, T. diffusum, and T. hirtum (Table 2) appear to have some agronomic potential.

In the past, neither T. dasyurum nor T. diffusum has been used or developed as a commercial forage legume variety. T. hirtum, commonly called rose clover, has been utilized under adverse environmental conditions in California and Australia. It was originally introduced into the U. S. from Turkey. Some of its favorable attributes include: 1) adaptability to a wide range of soil types and soil pH; 2) ability to grow on infertile soils; and 3) natural reseeding ability.

Seed from each line listed in Table 2 was harvested. Sufficient seed was produced on seven of the lines to allow for seeding in replicated yield trials in the fall of 1979.

Table 1. Annual clover species evaluated at Overton - 1978-79.

<u>Species</u>	<u>No. of types within species</u>
<u>Trifolium alexandrinum</u>	1
" <u>balansae</u>	2
" <u>dasyurum</u>	1
" <u>diffusum</u>	8
" <u>hirtum</u>	8
" <u>lappaceum</u>	1
" <u>maritimum</u>	1
" <u>nigrescens</u>	3
" <u>pallidum</u>	5
" <u>resupinatum</u>	22

Table 2. Annual clover types rated highest for stand establishment, available forage, and overall agronomic fitness - Overton, Texas, 1978-79.

<u>Species</u>	<u>P.I. No.</u>	<u>Stand establishment</u>	<u>Available forage</u>	<u>Composite score</u>
<u>Trifolium dasyurum</u>	263248	1.6	5.3	2.3
" <u>diffusum</u>	120144	1.1	4.0	1.7
" "	120219	1.1	4.3	1.8
" "	369032	1.2	5.0	2.1
" "	BN-9539-62	1.8	4.5	2.1
" <u>hirtum</u>	287973	1.0	4.3	1.8
" "	287975	1.1	4.2	1.8
" "	311483	1.2	4.5	1.9
" "	120248	1.2	4.8	2.0
" "	311485	1.2	5.0	2.1
" "	234050	1.9	4.8	2.2

Overall mean = 2.9

Stan. Dev. = .6