



Forage Research in Texas

1983

Evaluation of Subterranean Clover Plant Introductions

G. R. Smith¹

SUMMARY

One hundred seventy-four plant introductions (PI) of subterranean (sub) clover (Trifolium subterraneum L.) were evaluated in 12-ft rows in 1981-82 at Overton. Two grams per row of inoculated seed were planted in a Bowie fine sandy loam soil. The lines were evaluated in December and February after an October planting. Vigor and stand ratings were taken by two individuals and averaged. Fifteen PI's were identified with excellent forage production potential and were scheduled for further evaluation in replicated yield trials.

Introduction

Sub clover is a prostrate growing winter annual forage crop with potential for increased use in pasture systems across the south. This species is self-fertile with small inconspicuous flowers. After fertilization the stem (peduncle) supporting the flowers elongates toward the ground, burying the seed, enveloped in a calyx bur, in the soil. This characteristic of 'pegging' the seed toward the soil surface allows a seed crop to be produced under normal grazing. For reseeding of other widely used winter annual clovers such as crimson (Trifolium incarnatum L.) and arrowleaf (Trifolium vesiculosum Savi.) grazing animals must be removed to allow flowering and seed production in late spring.

Sub clover is Mediterranean in origin and is now widely used in Australia and New Zealand. Twenty or more commercial varieties are now available from Australia ranging widely in maturity, cold tolerance and general adaptation in East Texas. An annual clover breeding program was initiated at Overton in 1979 and sub clover identified as one of several Trifolium species targeted for improvement. Objectives in the sub clover breeding program include improved reseeding under humid summer conditions, pest resistance and improved winter production. We have started the collection of sub clover germplasm for use in breeding and report here the initial evaluation and seed increase of 174 plant introductions from 4 countries.

Procedure

Twelve foot rows of 174 sub clover plant introductions and five check varieties were planted October 15, 1981 in a Bowie fine sandy loam soil. Soil test ratings of phosphorus and potassium were very low and soil pH (0-6 inches) was 6.0. One-half ton of agricultural lime and 450 lbs per acre of 0-20-20 fertilizer was

¹ Assistant professor, Texas A&M University Agricultural Research and Extension Center at Overton, Overton, TX 75684.

applied and incorporated prior to planting. Two grams of seed were planted per row after inoculation with peat inoculant (Type WR) supplied by the Nitragin Company. Pelgel solution was used as a sticker and 0.15 grams of inoculant was applied per gram of seed.

Seed of 41 PI's from Australia, New Zealand, Tunisia and several other regions were in sufficient quantity to plant two replicated rows. Eight of these 41 PI's were supplied by W. L. Graves, University of California, San Diego, California. The remaining thirty-three PI's were obtained from the Southern Regional Plant Introduction Station, Experiment, Georgia and had been increased at Overton in 1979. Seed of 133 accessions from Spain (obtained from W. E. Knight, USDA-ARS, Mississippi State, MS) were limited in quantity and only one row of each was planted.

Stand percentage was estimated December 21. Vigor notes were taken the same day and again on February 24. Maturity was noted throughout the growing season and seed harvested in June.

Results

A wide range of vigor estimates and maturities were noted among the PI's evaluated. Eleven lines were flowering when the February notes were taken. These very early sub clovers produce little forage and are unacceptable for use in east Texas. Seed were harvested from most all PI's and many lines will be re-evaluated for hard seed production and performance on different soil types.

Fifteen sub clover PI's were identified as having forage production potential equal to or better than the check varieties (Table 1 and 2). These lines were all mid-season or late in maturity with acceptable winter vigor. Although January temperatures dipped to 6°F no cold damage was noted. These 15 lines will be incorporated into replicated yield trials to estimate seasonal forage production.

Procedures

Twelve foot rows of the sub clover plant introductions and five check varieties were planted October 15, 1981 in a Bowie line sandy loam soil. Soil test readings of phosphorus and potassium were very low and soil pH (0-6 inches) was 8.0. One-half ton of agricultural lime and 450 lbs per acre of 0-20-20 fertilizer was

Table 1. Vigor notes and stand percentage of sub clover plant introduction lines and check varieties in replicated rows.

Variety/line	Stand % 12-21	Vigor ¹		Maturity ³
		12-21	2-24	
Checks				
Mt. Barker	85.0	1.6	1.6	M
Woogenellup	83.7	1.3	1.5	M
M. Ecotype	65.0	1.5	3.2	M
Tallarook	91.2	1.5	1.8	L
Nangeela	67.5	1.5	1.4	M
Plant Introductions (PI) ²				
209924	92.5	2.0	2.1	M
239907	88.7	1.2	1.4	M
401568	78.7	1.3	2.0	M
401567	85.0	1.1	2.1	M
401573	85.0	1.2	2.1	L
291917	78.5	2.6	2.3	M
223868	76.5	2.3	2.9	M
209927	72.0	2.7	2.9	L
Range for all PI's	92.5-32.5	1.1-4.5	1.4-4.3	VE-L

¹ 1 = best, 5 = poor. All ratings the average of two reps and two individuals.

² A total of 41 PI's were evaluated. Ratings of only the best are shown here.

³ Approximate maturity. VE = very early, E = early, M = midseason, L = late.

Table 2. Vigor notes and stand percentage of sub clover plant introductions and check varieties in single rows.

Variety/line	Stand %	Vigor ¹		Maturity ³
	12-21	12-21	2-24	
Checks				
Mt. Barker	90.0	1.7	1.9	M
Woogenellup	95.0	1.7	1.5	M
M. Ecotype	70.0	3.0	3.3	L
Tallarook	95.0	2.2	1.9	L
Nangeela	75.0	2.7	2.0	M
Plant Introductions ²				
LO 593	95.0	1.7	2.1	L
LO 589	95.0	1.2	1.8	L
LO 596	95.0	1.5	1.9	L
LO 712	57.5	3.7	3.7	L
LO 993	70.0	3.0	3.3	M
LO 32	65.0	2.5	2.6	L
LO 1598	52.5	3.0	3.2	M
Range for all PI's	95.0-12.5	1.2-4.7	1.8-4.5	VE-L

¹ 1 = best vigor, 5 = poor vigor. All ratings the average of two individuals.

² A total of 133 PI's were evaluated. Ratings of only the best are shown here.

³ Approximate maturity. VE = very early, E = early, M = midseason, L = late.