PUBLICATIONS

1981

Forage Research in Texas

Departmental Technical Report No. 81-12

Department of Soil and Crop Sciences

CY-0071

Project: H 1899

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Location: Beeville

EVALUATION OF SUBTERRANEAN CLOVER CULTIVARS AND PLANT INTRODUCTIONS

OBJECTIVE:

To determine the performance of subterranean clover in a 760 mm rainfall area.

PROCEDURE:

Eleven subterranean clover cultivars were seeded on October 6, 1978, at the rate of 20 kg/ha in plots consisting of 5 rows, 30 cm row spacing, 6 m long, 4 replications.

Twenty-six plant introductions were planted in single row plots, 6 m long, 2 replications, on October 6, 1978, at a seeding rate of 20 kg/ha. Accumulated growth was estimated at approximately 2-week intervals beginning March 14, 1979, by removing plants at the ground level from 60 cm of row until leaf senescence indicated that loss of dry weight was occurring. Observations were also made on winter damage, lateral spread and plant height.

RESULTS:

Subterranean clover cultivars differed widely in date of maturity and have previously been classified for this characteristic (Table 1). In an area with good expectation of spring rainfall, it seems likely that a mid to late maturing cultivar would have an advantage over early maturing cultivars. The performance in 1978-79 seems to confirm this conclusion. Total dry matter accumulation (Table 1) was a little lower than measured in reseeding stands at the same location in the same year.

Observations and measurements of plant introductions indicate a range in several characteristics (Table 2). Plant height near maturity varied from 25 to 58 cm. All of the accessions showed some winter damage from early January low temperatures. Accumulated production on March 14, which represents fall and winter growth, varied from 100 kg/ha to more than 900 kg/ha. The ability to accumulate growth in the winter is important whether that growth represents the ability to grow at low temperatures or to respond to short periods of favorable temperature. Most of the accessions accumulated between 400 and 700 kg/ha of dry matter by March 14, but a few were either below or above these amounts.

There does not appear to be much relationship between early production and total production (Figure 1). One might expect early production to be assoicated with early maturity and possibly with reduced total production. At least one accession with good early production was also among the top four accessions for total production and two of the top producing accessions were near the bottom for early production. There appears to be some opportunity for selecting both early and acceptable total production.

There was no relationship between date at which maximum dry matter accumulation was recorded (date of maturity) and total dry matter accumulation (Figure 2). It should be pointed out that only a 29-day space of time with only 3 sampling or harvest dates was involved and that actual peak DM accumulation could have occurred a few days before or after the date on which the peak was recorded. This could change the total DM levels in some instances but would not likely change the lack of relationship between maturity date and total production. A wider range of maturity dates exists in the species but shorter season accessions had been eliminated in the initial phase of the program on the assumption that the climate in South Texas favored later maturing types. It is possible that had earlier maturing types been included a better relationship would exist between length of time required to reach peak DM accumulation and total DM production.

The levels of production of the plant introductions (Table 2) are generally lower than the late maturing cultivars (Table 1). While the two tests were planted on the same date, the cultivars were planted in 30 cm rows and PI's in 100 cm rows, thus, the yields are not necessarily comparable. If we assume that the yields are comparable, the data indicate no yield advantage of any of the PI's over existing cultivars. A fewer number of PI's were planted in 1979 with Mt. Barker included as a check. Thus, directly comparable data will be collected.

In other studies at Beeville and Brady in which winter growth has been monitored, subterranean clover has made more early and winter growth than arrowleaf clover, Hubam sweetclover, or alfalfa. Thus, it appears to have potential for this characteristic. The data in this report indicate some potential also for further improvement in these characteristics.

Table 1. Performance of subterranean clover cultivars, Beeville, 1979.

Cultivar	Maturity[1]	Ground Cover[2]	Vigor[2]	Yield[3]
Mt. Barker	50%	4.2	4.0	3851
Geraldton	100%	2.5	1.5	
Dinninup	100%	3.0	2.3	
Tallarook	Immature	4.8	4.8	5304
Woogenellup	80%	3.5	3.8	3227
Dwalganup	90%	2.0	1.8	
Daliak	90%	3.0	1.5	
Seaton Park	100%	3.2	3.0	
Howard	Immature	4.9	4.6	3456
Miss. Ecotype	60%	3.5	2.8	4664
Yarloop	90%	2.0	3.0	

[1] Ratings made on May 9, 1979 based on leaf senescence.

[2] Relative ratings: 1 = poor to 5 = superior.

[3] Kg/ha;early maturing varities were not harvested because of loss of leaves prior to harvest date.

Table 2. The evaluation of subterranean clover accessions, Beeville, 1979.

Field Plot No.	P.I.	Height[1] (CM)	Crown[2] Spread (CM)	Winter Survival (%)	Relative Vigor (10=best)	Accumulated Dry Weight[3] G/M^2 3/14	Date	Maximum
100 207	158387	58	75	75	7.5	60	5/24	309
101 208	168638	40	86	90	8.0	92	5/9	210
102 209	184962	43	75	70	6.5	56	4/25	207
103 210	190564	44	73	65	6.5	61	5/24	284
104 211	190568	39	80	70	7.5	72	5/24	273
105 212	190577	27	88	40	4.5	51	5/9	371
106 213	209926	42	70	75	6.0	84	5/9	274
107 214	209930	41	96	70	6.5	66	5/9	178
108 215	233866	43	72	75	6.5	78	5/24	295
109 216	233867	38	82	80	7.0	86	5/9	201
110 217	233870	46	100	75	6.5	53	5/9	248
111	239901	54	122	50	7.5	62	5/9	275
112 218	239904	42	85	55	6.0	58	5/9	254
113 219	239906	39	79	60	6.5	43	5/24	286
114	239910	36	69	60	6.0	30	5/24	258
115 220	241461	38	91	60	6.0	76	5/9	357
116 221	277437	38	74	60	7.0	25	4/25	405
117 222	277439	37	74	65	6.5	68	5/9	302
118 223	279010	35	97	60	6.5	70	5/9	287
119 224	287998	55	99	60	7.0	66	5/9	272
120 225	302977	<---------- Mixed Stand ---------->						

Table 2 continued

121	311496	44	83	25	6.5	29	5/9	307
122	319141	39	87	40	6.5	16	5/24	378
123 226	319142	45	100	50	6.0	16	4/25	175
124 227	319143	36	93	35	6.0	10	4/25	229
125 228	319146	45	75	50	6.5	39	5/24	258

[1] Maximum height was attained on most accession either on April 25 or May 9.

[2] Plots were planted in 1 m wide rows.

[3] Values X 10 = kg/ha.

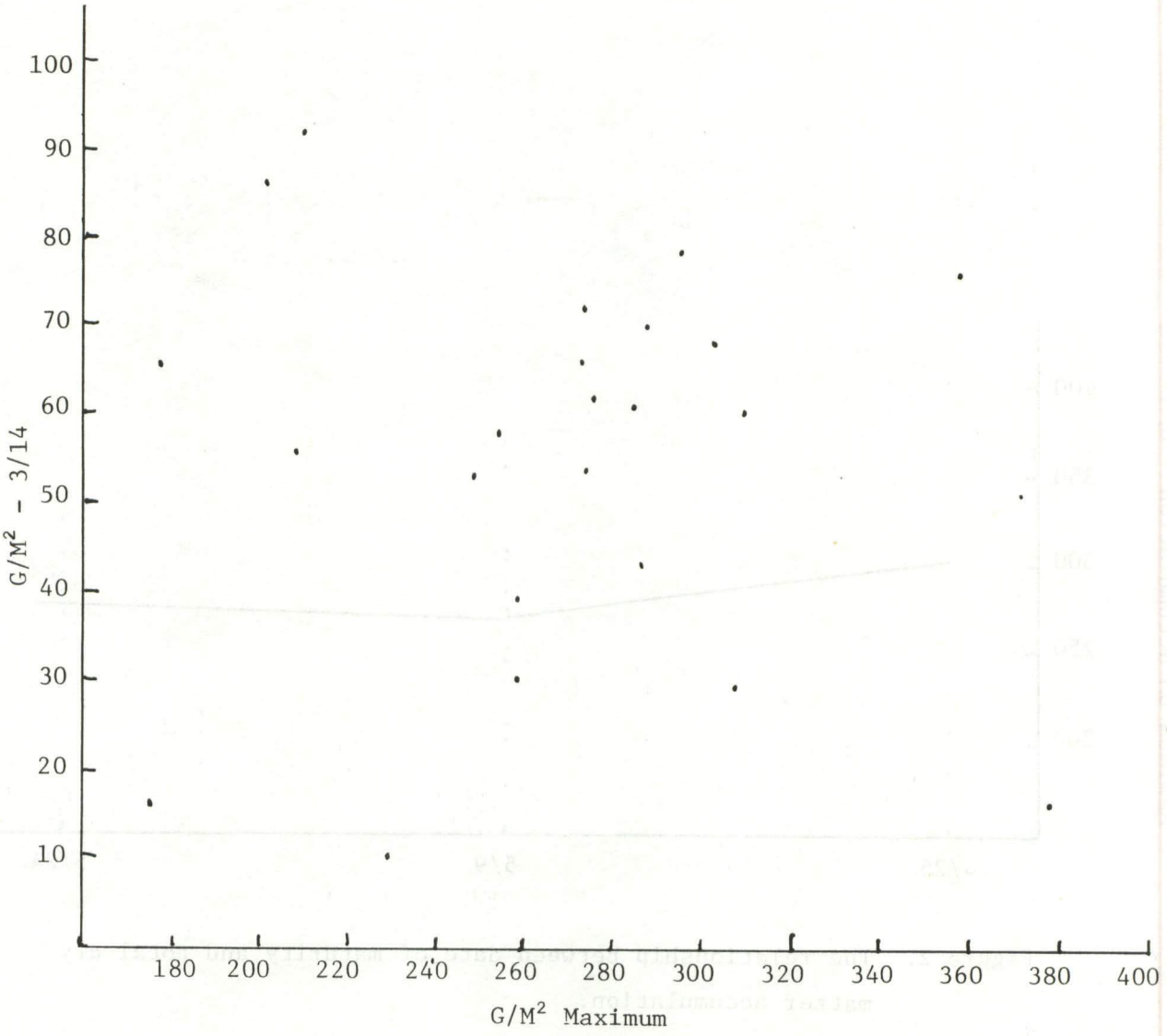

Figure 1. The relationship between early and total dry matter of 25 subterranean clover accessions. Beeville, 1979.

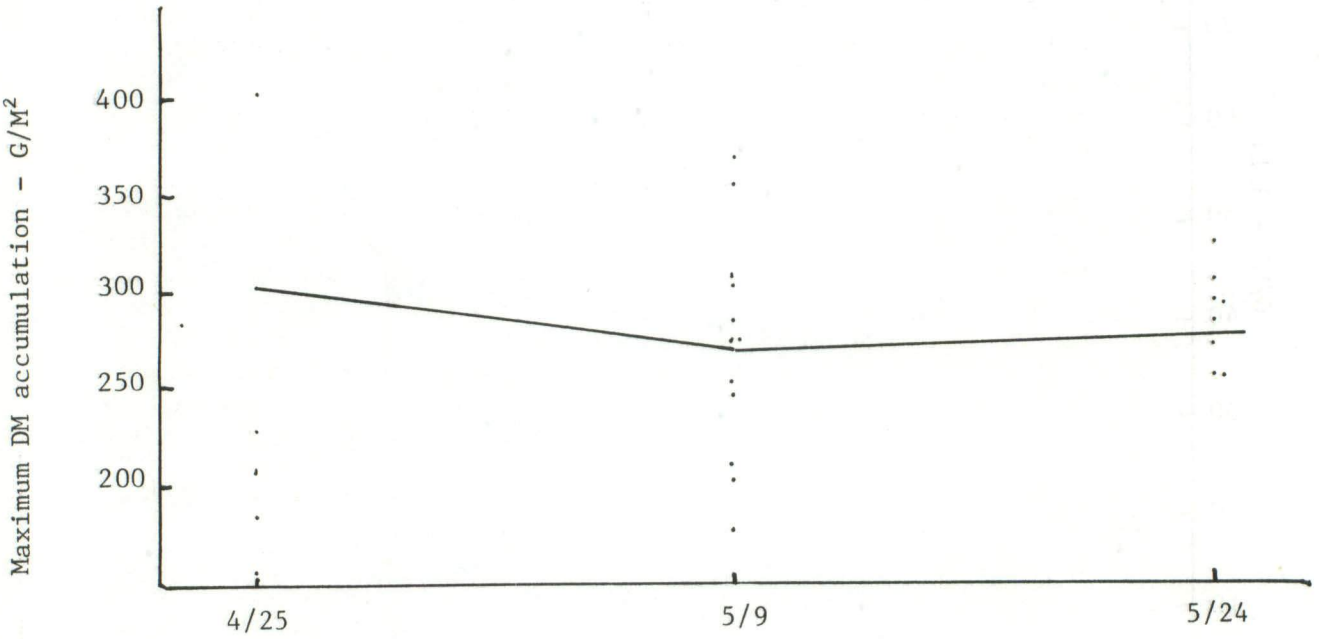

Figure 2. The relationship between date of maturity and total dry matter accumulation.