

# Forage Research in Texas

Departmental Technical Report No. 81-12

Department of Soil and Crop Sciences

Project: H 1899

Worker: E. C. Holt  
L. D. Allison

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 reseeded 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 associated 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 <sup>1</sup> | Ground <sup>2</sup><br>Cover | Vigor <sup>2</sup> | Yield <sup>3</sup> |
|---------------|-----------------------|------------------------------|--------------------|--------------------|
| 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                |                    |

<sup>1</sup> Ratings made on May 9, 1979 based on leaf senescence.

<sup>2</sup> Relative ratings: 1 = poor to 5 = superior.

<sup>3</sup> Kg/ha; early maturing varieties 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 <sup>1</sup><br>(CM) | Crown <sup>2</sup><br>Spread<br>(CM) | Winter<br>Survival<br>(%) | Relative<br>Vigor<br>(10=best) | Accumulated Dry Weight <sup>3</sup><br>G/M <sup>2</sup> |                 |
|----------------|--------|-----------------------------|--------------------------------------|---------------------------|--------------------------------|---|-----------------|
|                |        |                             |                                      |                           |                                | 3/14  | Date<br>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 |

<sup>1</sup> Maximum height was attained on most accession either on April 25 or May 9.

<sup>2</sup> Plots were planted in 1 m wide rows.

<sup>3</sup> Values X 10 = kg/ha.

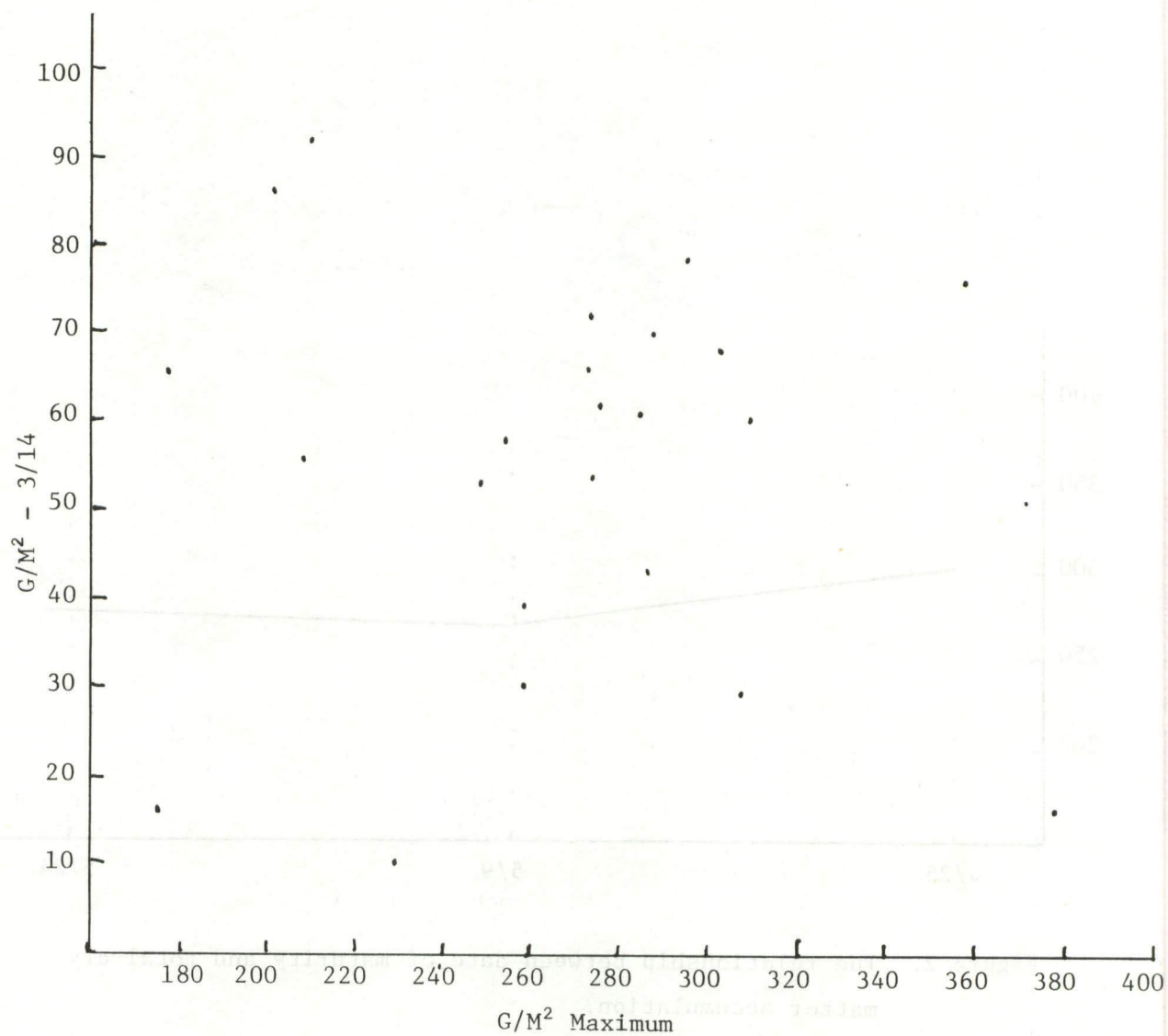


Figure 1. The relationship between early and total dry matter of 25 subterranean clover accessions. Beeville, 1979.

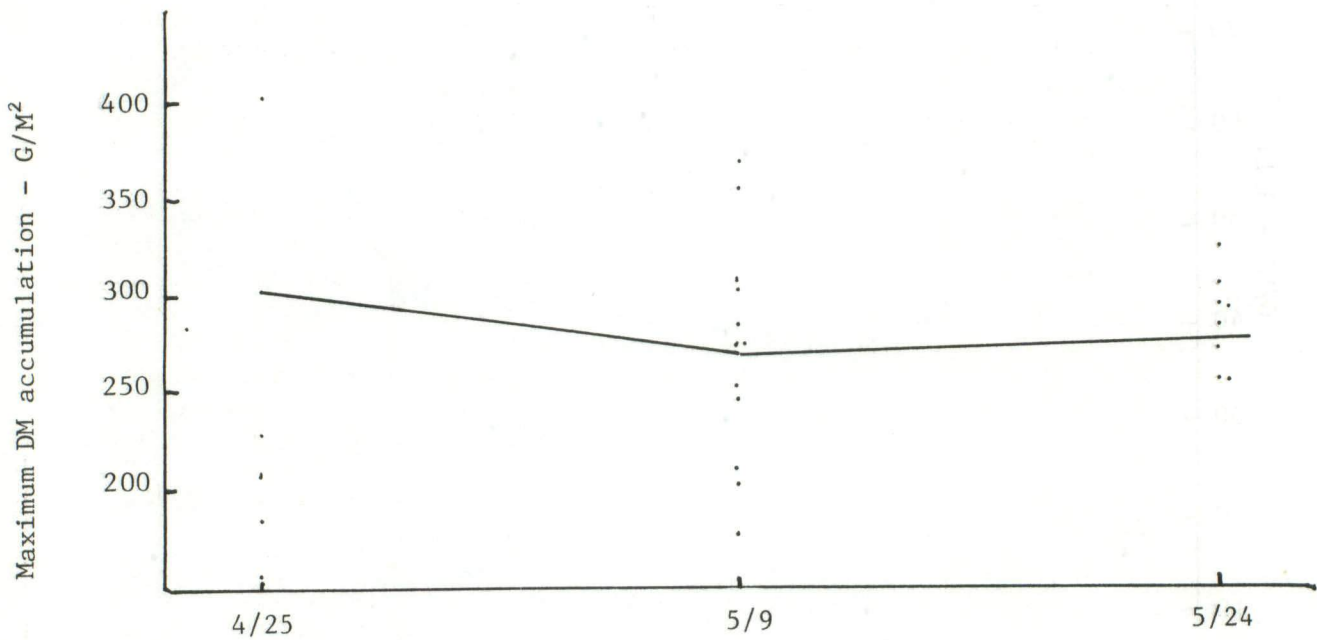


Figure 2. The relationship between date of maturity and total dry matter accumulation.