

Comparing Fine-Stem Sweetclover Maturities In Texas

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Annual white sweetclover (*Melilotus alba* Desr.) was the major forage legume species in Texas before the advent of cheap nitrogen fertilizer because of its excellent drought tolerance. A thick main stem and high coumarin levels were undesirable characteristics. Because of increasing nitrogen fertilizer prices, a sweetclover breeding project was initiated in Texas to combine a multi-stem morphology similar to alfalfa from Emerald sweetclover with a low coumarin level from Denta sweetclover. Emerald sweetclover has a wide range in flower initiation ranging from mid-March to mid-May under greenhouse conditions. A cross section of Emerald maturities and Hubam sweetclover were planted at three latitudes in Central Texas to document flowering time and growth under field conditions.

Seedlings of Emerald maturity groups 2, 4, 7, and 10/11 and Hubam sweetclover were transplanted in November 2002 on alkaline clay soils at Beeville (28.45°N), Thrall (30.59°N), and Bristol (32.46°N), Texas. A replication consisted of single row plots (1 m apart) of each entry with 15 plants per entry spaced 30 cm apart within the row. Beginning in January 2003, plant height and growth stage (vegetative, bud, flower, or seed) were recorded monthly. In February, March, and April, 3 plants from each row were cut at a 5-cm height to record stems/plant.

Plant elongation first began at the southern Beeville location because of the milder winter temperatures followed by the Thrall location with the latest plant elongation at the northern Bristol location. In March, average plant heights of all entries were 65.1 cm at Beeville, 31.9 cm at Thrall, and 25.1 cm at Bristol. Plant development followed the same trend with the earliest flowering at the southern Beeville location and latest flowering at the northern Bristol location. In January, the percentage of plants at the reproductive stage (bud, flower, and seed) averaged across locations were Emerald maturity 2 (81%), maturity 4(40%), maturity 7 (29%), maturity 10/11 (0%), and Hubam (23%). By April, the averages were Emerald maturity 2(85%), maturity 4 (76%), maturity 7 (90%), maturity 10/11 (9%), and Hubam (73%). Some variability for flowering still occurred within maturity groups. By May the percent of late Emerald maturity 10/11 plants reaching the bud or flowering stage was influenced by day length with 23%, at Beeville, 64% at Thrall, and 97% at Bristol. Stems/plant of Emerald maturities 2, 4, and 7 averaged about 30 in February increasing to about 45 by April. The delayed elongation of the late maturity Emerald 10/11 resulted in only 15 to 30 stems per plant. In contrast to the multi-stem morphology of Emerald, stems/plant of Hubam ranged from 5 in February to 13 in April. Emerald maturity 7 is best the maturity for forage production and the earlier maturity 2 could be used as a green manure crop in rotation with a summer annual crop.