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SEEDLING DEVELOPMENT OF ALFALFA, SWEETCLOVER, AND ANNUAL MEDIC

G. W. Evers and M. J. Parsons

Background. Livestock producer interest in using forage legumes has increased because of rising nitrogen fertilizer prices. In the southeastern US, cool-season forage legumes are primarily grown with cool-season grasses and used for grazing. Good seedling vigor and rapid leaf production enhance establishment and competitiveness when grown with grasses. Three relatively new forage legume species for Texas are grazing-tolerant alfalfa, multi-stem annual sweetclover, and Armadillo annual medic. Since most alfalfa varieties have been developed for hay production they will not persist under grazing. Although annual sweetclover is a well adapted forage legume for Central Texas, very little is planted because of high coumarin levels that can cause animal health problems and a large central stem that reduces digestibility. New sweetclover varieties are in the development stage that have low coumarin and a multi-stem morphology like alfalfa. Annual medics are close relatives to alfalfa and have good seedling vigor and excellent reseeding ability.

Twelve pots (6 in. high x 6 in. diameter) were planted to Alfagraze and Amerigraze 702 alfalfa, Hubam and Emerald sweetclover, and Armadillo medic on February 12, 2004. Two seed were planted in the center of the pot and 7 to 8 seed planted around the outer edge of the pot to simulate plant growth in the field. The center plants were thinned to one plant on which measurements were taken. Each day seedlings were checked for new fully expanded leaves, beginning with the unifoliate leaf, and secondary branching.

Research Findings. The rate of leaf appearance is important because leaf area influences the amount of photosynthesis which provides carbohydrates for growth. Leaf appearance of the alfalfas and Armadillo medic was more rapid than sweetclover (Fig. 1). A new leaf appeared every 3.2 days on alfalfa and Armadillo medic and every 4.8 days on sweetclover. Appearance of new branches on the main stem was slow for all entries up to 24 days after planting (DAP) (Fig. 2). Armadillo medic and Emerald sweetclover seedlings produced the most secondary branching followed by Alfagraze alfalfa. Both

alfalfas were similar up to 24 DAP. From that point Alfagraze had slightly more secondary branching indicating better grazing tolerance. The main stem morphology of Hubam sweetclover resulted in the poorest secondary branching.

Application. Alfalfa and Armadillo medic had a faster rate of leaf appearance indicating better seedling vigor than sweetclover. Secondary branching of multi-stem Emerald sweetclover was significantly greater than Hubam sweetclover and slightly better than alfalfa indicating better grazing tolerance.

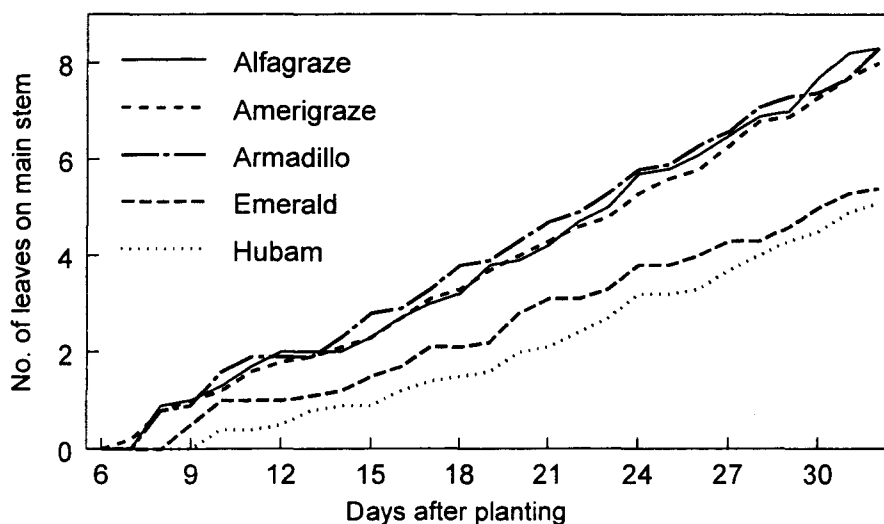


Fig. 1. Leaf development on the main stem of five forage legumes.

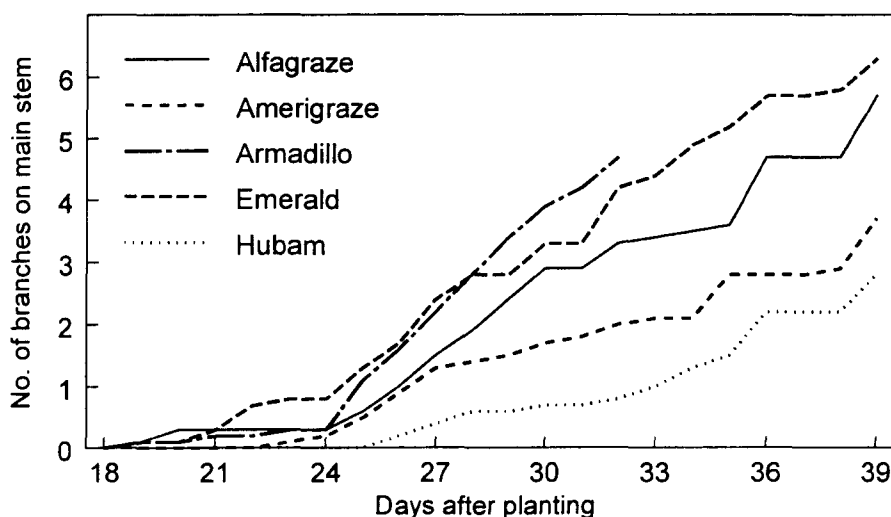


Fig. 2. Branch production on the main stem of five forage legumes.