

Preliminary Evaluation of Legumes as Cover Crops for Alkaline Clay Soils

T. J. Gerik, F. W. Chichester, C. L. Neely, and J. E. Morrison, Jr

Texas Agricultural Experiment Station and USDA-AAS, Temple, TX

Six legume species were evaluated as potential winter cover crops for no-tillage cropping systems at Temple, Texas. Legumes were planted on an Austin silty-clay (Entic Hapustolls, fine-silty, carbonatic, thermic, pH 8.3) on 28 October 1984 and included crimson clover, *T. incarnatum* (var. Dixie); sub-clover, *T. subterraneum* (var. Mt. Barker and Clare); arrowleaf clover, *T. vesiculosum* (var. Yuchi); barrel medic, *Medicago truncatula* (var. Jemalong); hairy vetch, *Vicia villosa*; and rose clover, *T. hirtum* (var. Kondinin, Wilton, Hykon, and seven experimental lines).

Periodic evaluations were made to determine percent ground cover, plant height, percent winter kill, forage potential, and flowering dates. Hairy vetch, 'Wilton' rose clover, and the experimental rose clover lines RM16 and RH7 had the highest plant growth ratings. Severe winter kill from frost heaving of soil prevented accurate estimations of plant growth for barrel medic and both sub-clovers. Leaf chlorosis was not evident in the surviving plants of barrel medic, but it severely affected crimson, arrowleaf, and the subterranean clovers. Flowering dates ranged from 29 March 1985 for barrel medic to 23 April 1985 for hairy vetch. These dates are considered too late to permit natural reseeding of winter cover crops for no-tillage cropping systems with grain sorghum and corn in central Texas, but they may be suitable for cotton.

Given the favorable plant growth rating of hairy vetch, further studies will be conducted this summer to determine the total amount of nitrogen fixed, rate of plant residue decomposition, and the rate of nitrogen release from the residue for vetch under conventional tillage and no-tillage with two irrigation levels.