DIALLEL ANALYSIS OF SEED-SET EFFICIENCY IN UPLAND COTTON Paul Irwin Ragsdale and C. Wayne Smith Department of Soil and Crop Sciences Texas A&M University College Station, TX

<u>Abstract</u>

Seed-set efficiency (SSE) is one of the most fundamental within-boll yield components in upland cotton (*Gossypium hirsutum* L.). Increased SSE should lead to increased seed number and ultimately to greater fiber yield. Diallel analysis was conducted to determine the potential to breed for improved SSE in upland cotton. Eight parents and their F_1 progeny (without reciprocals) were evaluated near College Station, TX, in 2000 and 2001. The parents included: 1) Four converted race stock (CRS) accessions representing extreme values of SSE; 2) Three commercial cultivars--representing Texas, Delta, and Eastern types; and 3) an elite Texas A&M strain with low SSE. Preliminary analysis of variance for the diallel dataset showed a significant genotype × year interaction. Analyses of variance for the individual years showed highly significant genotypic effects, allowing GCA and SCA effects to be calculated. GCA and SCA effects were each found to be highly significant in 2000 whereas only SCA effects were significant in 2001. Additive and dominance genetic variation appear to influence SSE in this population. A separate, although not independent, analysis of variance for the eight parental lines for mean SSE *per se* showed no genotype × year interaction and a highly significant main effect for genotypes. The parental genotype with the highest mean value for SSE over both years (TX 0162) also had the highest value for GCA effects in each year. The parental genotype with the lowest mean value for SSE over both years (TX 0244) also had one of the lowest GCA effects in each year. It appears that breeders should be able to select for higher seed numbers by using CRS TX 0162.