COTTON POTASSIUM DEFICIENCY – COSMETIC OR REAL? John S. Kruse Brenda Tubana LSU AgCenter Alexandria, LA Gaylon Morgan Texas AgriLife Extension Service College Station, Texas

<u>Abstract</u>

Visual potassium deficiencies in cotton have recently been observed with increasing frequency and over a wide range of circumstances in Louisiana, on soils historically understood to contain adequate levels of potassium for cotton production. It is unclear to what extent these symptoms are linked to variety selection, and to what extent the apparent deficiencies are a factor in limiting yields. The objective of this study was to determine yield response to applications of potassium fertilizer in a field pre-determined by soil test to have medium to high levels of soil potassium. Three cotton varieties (DP 0912, ST 5288, and PHY 499) were selected and planted on a Commerce silt loam in the Louisiana Delta. Treatments included no potassium fertilizer, 44.5 kg K ha-1, or 89 kg K ha-1 applied as granular muriate of potash, pre-plant surface broadcast. Additional treatments included either no foliar potassium, or 8.9 kg KNO3 ha-1 applied at first bloom, first bloom plus 2 weeks, and first bloom plus 4 weeks (total 26.7 kg KNO3 ha-1) as potassium nitrate dissolved in solution. All treatments were replicated 4 times in a Randomized Complete Block design. Soil samples were extracted prior to fertilizer application. Leaf tissue samples were collected at first bloom plus one week, first bloom plus 3 weeks, and first bloom plus 5 weeks and analyzed for potassium content. Visual potassium deficiency symptoms were recorded as observed. Plant mapping for presence of first, second and third position bolls was conducted prior to harvest. Yield, turnout and quality parameters were collected. There were no significant two or three way interactions (variety, granular K rate, foliar K rate). Yield was significant (P=0.05) for variety, but not for granular of foliar potassium application rates. Plant mapping by granular and foliar application rates displayed few differences in total bolls per node. Leaf tissue potassium content was significantly different for granular potassium rates, but was inconsistent at the first sampling date, with the highest rate of granular potassium producing between 8850 and 9750 ppm K. The trial will be repeated in the following year to provide multiple year data.

In a similar manner, visible potassium deficiencies have been noted in Texas in both very wet years and very dry years, particularly throughout the Blacklands. A trial was established in the Northern Blacklands in which applications of a foliar fertilizer containing potassium (5-0-20-13S-1B) were made on a single cotton variety at early bloom and peak bloom at rates of 0, 9.4, 18.8, and 28.2 L ha-1 per application. There were no significant differences by treatment (P=0.05) for yield, turnout or quality parameters such as length, strength, and micronaire.