COTTON CROP WATER USE AND IRRIGATION SCHEDULING IN GEORGIA Craig W. Bednarz University of Georgia Tifton, GA Marshall C. Lamb National Peanut Research Laboratory Dawson, GA

<u>Abstract</u>

In 2002 and 2003 irrigation studies were conducted at the University of Georgia (UGA) Coastal Plain Experiment Station Gibbs and Lang Farms as well as the UGA Stripling Irrigation Research Park near Camilla, GA. All facilities are equipped with overhead irrigation systems. Cotton (DPL 458 or DPL 555) was planted in late April or early May in all studies. Irrigation treatments were (1) non-irrigated, (2) full irrigation until first cracked boll, (3) full irrigation until 50% open boll (4) non-irrigated from stand establishment to first square, (5) non-irrigated from stand establishment to first flower (6) non-irrigated from first flower plus three weeks, (8) non-irrigated from first flower plus three weeks to first flower plus six weeks and (9) non-irrigated from first flower plus six weeks to cracked boll. Crop water use was monitored season long and irrigations were applied when the soil water status dropped below a predefined minimum.

It is a common notion that cotton irrigations prior to first flower are unnecessary or counterproductive. In our studies, withholding water from emergence to first flower reduced seed cotton yields by an average of 320 lbs./acre. Our studies also indicate the stage of crop development most sensitive to water deficit stress is the first three weeks of flowering. Withholding water during this stage reduced seed cotton yields by an average of 350 lbs./acre. Our research also shows this stage of crop development is one in which crop water use is the greatest.

It is generally understood the stage of crop development in which irrigations should be terminated is first cracked boll. An additional treatment was included in these studies to determine if delayed termination of irrigations until 50 percent open boll would increase yield. In two of the three locations additional irrigations were applied after first cracked boll as soil water status dropped below the predefined refill point. These additional irrigations, however, actually decreased lint yields by approximately 100 lbs. seed cotton/acre.

Across locations, an average of 7.56 inches of irrigation water was applied to the full irrigation until first cracked boll treatments. Lint yields in these treatments were an average of 1142 lbs. seed cotton/acre greater than the non-irrigated, which received an average of 17.5 inches of rainfall from planting to harvest across locations. Across locations, for every inch of irrigation water applied, lint yields were increased by 151 lb. of seed cotton/acre.