

**DELINEATING FACTORS CONTRIBUTING TO WITHIN-FIELD
VARIABILITY IN MISSISSIPPI DELTA COTTON
PRODUCTION FIELDS**

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The alluvial flood plains of the lower Mississippi River are nutrient rich, geographically young soils deposited during the cyclical flooding and drying episodes. Efforts to put the land into production have led to drainage of the swamps, particularly during the last 100 years. These natural and man-made events have resulted in rich agricultural fields of highly variable soils. Natural levees containing the lighter, well-drained soils surround the slack-water areas of heavy clay. The soils within a given field may range from excessively drained silt loams and loamy sands of recent natural levees to the poorly drained silty clay loams and clays found chiefly in slack water areas. Very minor differences in elevation can accentuate differences in soil drainage characteristics.

This study examines factors contributing to observed differences in cotton yield and quality within these alluvial fields. Primary differences in yield result from the water holding capacity of the soil. Excessively drained areas were found to have poor nutrient levels due to extensive leaching. While the germination efficiency was excellent on these highly friable soils, the low nutrient levels were insufficient to support crop growth, and yield was markedly reduced. The slowly draining areas, while nutrient rich, held excessive moisture, resulting in reduced germination and poor stand establishment. Regions of the field of intermediate drainage had a good yield potential. Notable differences in profit margin were observed for the various regions of the field. Future research is targeted at developing management scenarios that will match the input costs with the anticipated yield potential.