PRESCRIPTION MANAGEMENT OF COTTON FIBER QUALITY

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Abstract

Although genotype is the major determining factor for some cotton fiber properties, variations in the growth environment are significant determinants of fiber color, and uniformity of shape and maturity. Post-harvest plant maps of fiber properties are incomplete descriptors of the effects of field temporal and spatial variations upon intrinsic fiber quality. However, site-specific fiber-quality maps of spatial variability in soil properties and yield allow the formulation of zoned *prescriptions* for cultural inputs and other production management practices. In a two-year study in South Carolina, correlations among spatial variations fiber properties, soil pH, levels of phosphorus, sodium, calcium, magnesium, cation exchange capacity, or percent organic matter, were examined for the *Gossypium hirsutum* Upland cotton genotype, 'LA 887'. In both years, higher levels of phosphorus and percent organic matter were associated with increased fiber maturity and higher micronaire. Increased levels of phosphorus were also linked to decreased fiber yellowness, increased fiber whiteness and, thus, to higher color grades. Higher levels of potassium and percent organic matter were also correlated with improved fiber whiteness. The field sites highest in pH or calcium + magnesium content produced immature fiber with micronaire in the price-penalty range below 3.5, an effect that was intensified in the drier year in the study. In addition to identifying zones that might be improved by differential, site-specific applications of fertilizer, the correlated maps of fiber and soil properties illustrated zonal harvest strategies that would segregate fiber into a few bales of penalty-grade cotton.

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