

COVER CROP INFLUENCE ON POTASSIUM UPTAKE IN THE SOUTHEASTERN COTTON BELT

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Field experiments were established at three Mississippi locations to evaluate soil K₂O uptake and influence on cotton yield and fiber quality. Four winter cover crop treatments including no cover crop, cereal rye, crimson clover, and cereal rye plus crimson clover. Cover crop treatments were seeded into 38" rows to determine K₂O content in accumulated biomass. Phytogen 400 W3FE was planted at 42,000 seeds acre⁻¹ to determine K₂O leaf content at mid-bloom for all treatments. Soil samples were taken at cover crop initiation, cover crop termination, and harvest to track soil K₂O levels throughout the growing season. Cover crop termination soil samples were analyzed to determine cover crop influence on K₂O availability at planting. Harvest soil samples were analyzed to determine influence of fertilizer K₂O on soil K₂O levels. Fertilizer treatments included no K₂O, 150 lbs K₂O acre⁻¹ at planting, 150 lbs K₂O acre⁻¹ at pinhead square, and split application at planting and pinhead square. Harvest data collection included total node, first fruiting branch, and node above cracked boll. Mid-season height and node data were taken at pin head square, mid-bloom, and cutout. No differences were observed in lint yield when pooled across fertilizer application timing or cover crop treatment. However, there was a trend with greater numerical yield associated with cover treatments vs no cover crop. Also, a trend was observed with fertilizer application timing. A trend in greater numerical yields was observed in fertilizer applications vs no fertilizer applied. Soil samples in treatments containing cereal rye had reduced K₂O greater than other treatments; however, K₂O contained in dried biomass was similar across cover crop treatments. Considering the amount of biomass produced and temporarily immobilized K₂O contained in the aboveground biomass, we hypothesize as K₂O mineralization from the cover crop biomass it is readily available to the cash crop, signaling a niche for cover crop nutrient cycling in Mississippi cotton production systems.