EVALUATION OF REMOTE SENSING FOR PLANT GROWTH REGULATOR AND DEFOLIANT APPLICATIONS

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Abstract

Field studies were conducted at Stoneville, MS in a field approximately ten acres in size with cotton grown on 38-inch row spacing under normal production practices. Each plot was eight rows wide and 780 feet long planted in an east-west direction with soil variations ranging from silt loam (CEC 17.9) on the east end to clay (CEC 35.3) on the west end. Plots were randomized according to a randomized complete block design with three replications. Field boundary, plot boundaries and four geo-referenced data collection points per plot were mapped with a global positioning system (GPS). Data collected at each point included: plant height, number of nodes, percent vegetation ground cover, plant tissue analyses, percent boll opening, and percent defoliation. Soil analyses were from 1-acre geo-referenced grid sampling and a geo-referenced Veris device. Aerial multi-spectral imagery was collected at various times throughout the season. Variable rate plant growth regulator and defoliant applications were applied with a John Deere 6500 high-clearance sprayer equipped with a GPS controlled Spraying Systems Model 844 spray controller. All variable rate applications were based on field data collected at geo-referenced points and mapped using Agis (Delta Data Systems) geographical information system (GIS). Preliminary results indicate good correlations with multi-spectral remote imagery; bare soil imagery correlated much better with Veris data than with 1-acre grid sampling and high vegetative areas were easily distinguished from areas of sparse vegetation with remote imagery. Similar prescriptions for variable rate applications could be made using multi-spectral imagery.

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