HIGH THROUGHPUT CANOPY MAPPING OF COTTON WITH LIDAR

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Abstract

Implementation of portable light detection and ranging (LIDAR) as part of a high-throughput phenotyping system can provide cotton breeders and geneticists the ability to rapidly and objectively measure geometrical cotton canopy characteristics associated with drought and heat tolerance. Currently characteristics such as leaf index, leaf angle distribution, plant area density profiles are difficult and time consuming to acquire. LIDAR has the capability to make these acquisitions quick and frequent for tens to hundreds of test plots. When integrated with multispectral and thermal infrared observations, LIDAR scanning adds a new dimension, plant geometry, to the high throughput system. To test and evaluate these capabilities, a tractor-mounted LIDAR system was deployed in 2012 and 2013 over cotton Pima and Upland cotton trial studies at Maricopa, Arizona. Results from the surveys and implementation of a data processing, management and visualization system will be discussed.