

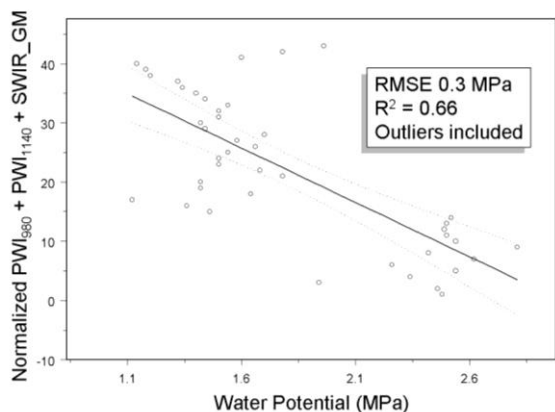
Precision Farming Field Studies for Cotton Harvest Aid Chemical Management



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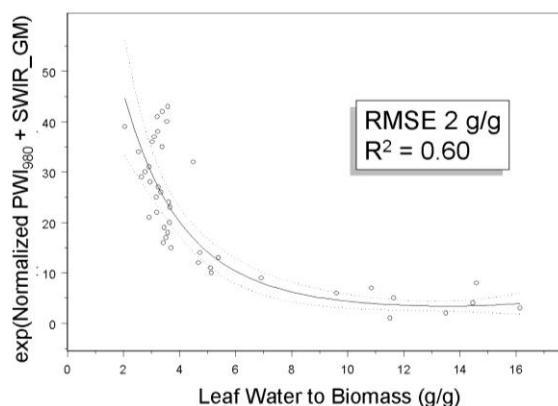
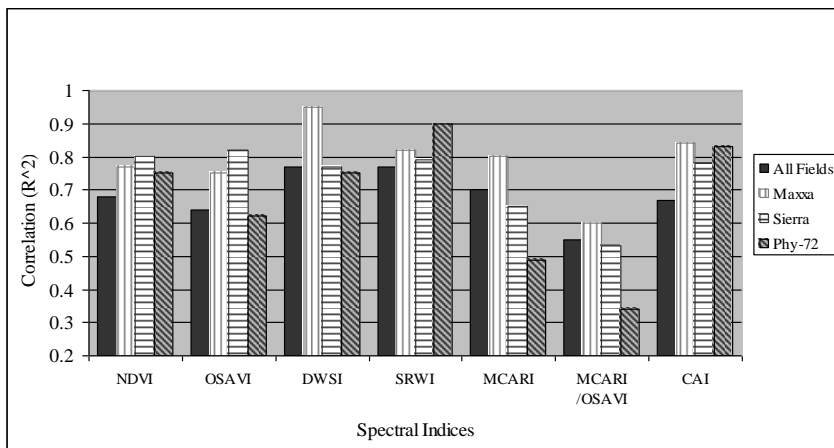
Remote sensing data improves the accuracy of spatial maps and provides timely data for early detection of field conditions that influence cotton yield and quality. To encourage the adoption of precision agriculture technologies, vegetation moisture content and efficiency of pre-harvest defoliation were selected to demonstrate their potential to impact management decisions and improve cost effectiveness.

Goal: To develop image analysis techniques for measuring spatially variable crop indicators for (1) specific defoliation management and (2) yield and lint quality.



Defoliation trials at the UC West Side Research and Extension Center (WSREC), Five Points, CA, began with pre-application, one week after each application, and ended spectral measurements just before harvest. Plant defoliation inspections and canopy spectral measurements were made in replicated 4 x 10 m experimental plots treated with two rates of three common harvest aid chemical combinations used in the San Joaquin Valley.

Combining multiple water band indexes, from the 0.98, 1.14, and 2.8 μm absorptions, increases the prediction of pressure chamber measurements of leaf water potential.



Regression coefficients (R^2) of the better vegetation and water indexes to trash among cultivars.

Whole leaf water content is a readily measurable property predictable by a second order polynomial model of the water band absorption indexes.

Hyperspectral spectral indexes and spectroscopy techniques are faster field tool and same analysis can be applied to hyperspectral imagery for determining spatially the readiness of the crop for chemical application.