USING MATHEMATICA TO ANALYZE REFLECTANCE SPECTRA FROM NITROGEN AND WATER STRESSED PLANT AND PIX TREATED PLANTS[1]

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Abstract

A set of experiments was conducted under controlled conditions involving various imposed treatments at the appearance of first floral buds in cotton plants (Gossypium hirsutuum L. var. NuCotn 33 B) planted in individual pots which were fed water and a complete Hoaglands solution to ensure optimum growth. The treatments were three levels of nitrogen, three levels of potassium, three levels of water, a PIX[3] x water interaction(three levels), and three levels of PIX. In each case, treatments were compared to a set of control plants which were not treated and grown under optimum conditions of water and nutrients supplied through a Netafim drip irrigation system with one dripper per pot. Data were collected on a weekly interval using a GER 1500 spectroradiometer which recorded canopy reflectance for the various treatments. The GER 1500 collects spectra over the range from 350 to 1050 nm in 512 equally spaced data points. The Mathematica software system with the Wavelet Explorer and the Signals and Systems packages were used to analzye the spectra from the above experiments. This paper will report on the results.

Footnotes

[1] A submission from the USDA-ARS Genetics and Precision Agriculture Research Unit in collaboration with the Mississippi Agriculture and Forestry Experiment Station, Mississippi State, MS, 39762.

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[3] Brand names are mentioned for information purposes only and do not represent a recommendation or endorsement by the USDA-ARS.

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