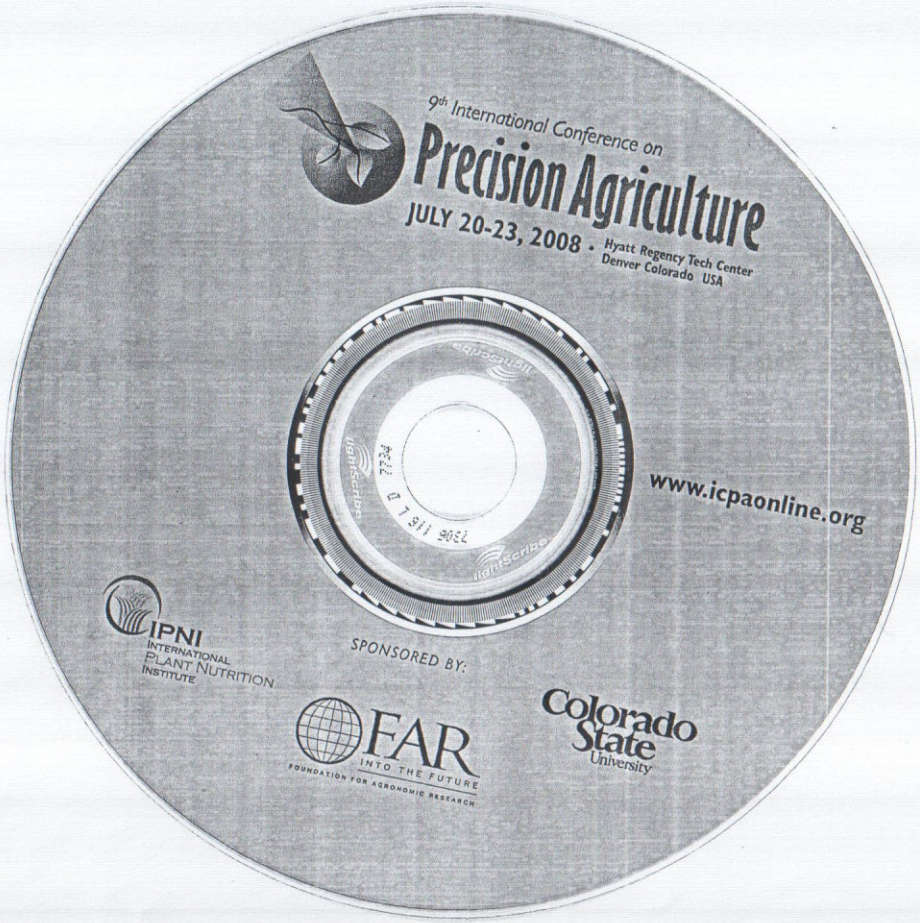
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Conference Abstracts

USING ACTIVE SENSOR AND ULTRASOUND READINGS TO ASSESS PLANT N STATUS

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Active optical sensors have been studied as a means to ascertain plant N status. The active sensor used in our work was the Crop Circle model ACS-210 of Holland Scientific (Lincoln, NE). It produces a vegetation index (NDVI) computed from sensor reflectance readings in the near infrared (880 nm +/-10 nm) and visible (590 nm +/-5.5 nm) bands, collected at the rate of ten readings per second. With the sensor mounted on a fertilizer applicator traveling at typical field operational speeds, readings from a sugarcane crop could be collected directly over plants and in between plants. Thus it may not be possible to determine if low sensor NDVI values are due to sensor reading acquired between plants or real crop N stress. Plant height is a parameter that represents plant growth status. Using an ultra-sound distance sensor, it is possible to assess relative plant size and/or presence at early crop stages. We assembled a high-clearance machine configured with both the Crop Circle and an ultra-sound sensor (50 kHz Electrostatic Transducer) to collect synchronized crop reflectance readings and ultrasonic distance measurements since at an early crop growth stage. A field experiment was conducted using15 different sugarcane varieties and 3 N fertilizer rates (zero, 60 kg/ha and 120 kg/ha). Both sensor readings showed good correlation. This work discusses the use of both active sensor determined vegetation indices along with ultrasonic determined plant height measurement to more accurately assess sugarcane N status.