

1403 Monitoring crop maturity with the normalized difference vegetation index

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Spectral reflectance from the cotton canopy may indicate progress towards crop maturity. Research was conducted in long-term no-tillage plots at Jackson, Tennessee, to determine the relationship between normalized difference vegetation index (NDVI) and crop maturity. Plots with winter cover crop (wheat or vetch) and nitrogen fertilization (0 or 100 kg N ha⁻¹) treatments were planted to cotton in 2005 and 2006. Canopy NDVI data were collected weekly after first bloom, using an active hand-held sensor suspended above the canopy and aligned with the rows. Values of NDVI were calculated as the difference between red and infrared reflectance, divided by the sum of red and infrared reflectance. Nitrogen deficiency reduced NDVI earlier than sufficient N, as >1,100 degree-days (base 15.6° C) accumulated after planting in 2005. In 2006, NDVI values remained higher with the 100 kg N + vetch cover treatment than with other treatments as >1,000 degree-days accumulated. These NDVI differences corresponded to treatment differences in degree-day accumulation to cracked boll. Results suggest that NDVI could be developed as a tool for monitoring crop maturation.