

## **Optimum sugarcane growth stage for canopy reflectance sensor to predict biomass and nitrogen uptake**

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The recent technology of plant canopy reflectance sensors can provide the status of biomass and nitrogen nutrition of sugarcane spatially and in real time, but it is necessary to know the right moment to use this technology aiming the best predictions of the crop parameters by the sensor. A study involving eight commercial fields located in the state of São Paulo, Brazil, varying from 16 to 21 ha, planted with four varieties, was conducted during two growing seasons (2009/10 - 2010/11). Conditions varied from sandy to heavy soils and the previous harvesting occurred in May and October (early and late season), including first to fourth ratoon stages. Fields were scanned with the reflectance canopy sensor (N-Sensor<sup>TM</sup> ALS, Yara International ASA) three times in the first season (approximately at 0.2, 0.4, and 0.6 m of stem height) and two on the second season (0.3 and 0.5 m), followed by tissue sampling for biomass, crop height and nitrogen uptake on ten spots inside the area, guided by the different values shown by the canopy sensor. At 0.2 m of field average stem height, sugarcane biomass is low for a good sensor prediction of the parameters; at 0.6 m height starts the phenomenon of saturation, where the ability of the sensor to predict biomass and nitrogen begins to be affected. Between 0.3 and 0.5 m of stem height results show the best correlation between real and sensor predicted biomass and nitrogen uptake for sugarcane crop, indicating that this is the right period for using the sensor to guide variable rate nitrogen application.

Key words: nitrogen management, proximal sensing, N-Sensor.