

USE OF NORMALIZED DIFFERENCE VEGETATION INDEX TO ASSESS NITROGEN STATUS IN MAIZE PLANTS AND GRAIN YIELD PREDICTION

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Sustainable Nitrogen (N) management during the initial growing stages in maize (*Zea mays*) is crucial to the efficient absorption of this nutriment increasing dry-matter accumulation and high grain yield. Technologies are available to obtain in-field N status assessment, in a quick and non-destructive manner. In maize, canopy reflectance data could be recorded using hand-held devices during the initial growth stages, for timely N management. The objective of this study was to determine the N status of maize plants using NDVI during the vegetative stage and the prediction of grain yield. 10 maize single-hybrids were evaluated at three N-restriction levels (25, 50, 75%) relative to the control, imposed at sowing according to the recommended dose. Treatments were laid out in a randomized complete block design with the split-plot arrangement and three replications, where N-doses were the main plots. A GreenSeeker hand-held crop sensor was used for NDVI measurement. This device measure reflectance at the wavelength in the red (670 nm) and near infra-red (780 nm) region of the electromagnetic spectrum. Grain yield (kg.ha⁻¹) was estimated from an 8.32 m² plot, at 12% grain humidity. In our results, NDVI values tended to increase with lower N- restriction, ranging from 0.37 to 0.79 ($p < 0.05$), and varied considerably among hybrids. As expected, lower grain yield was found at the 75% N-restriction trial, with mean values of 2330 kg.ha⁻¹. However, a higher yield (9209 kg.ha⁻¹) was observed in the 25% N-restriction trial. The grain yield of some hybrids were superior at 25-50% N-restriction, indicating a high performance under moderate stress, useful to soils with moderate fertility or lower agronomic practices. A strong correlation was observed between NDVI and grain yield, and N-restriction, with values of r^2 of 0.67 and 0.77, respectively.

Keywords: NDVI; N-status; spectral reflectance; *Zea mays*

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