



Chlorophyll Meter Readings Can Predict Corn Nitrogen Need and Yield Response

Earlier research indicated that chlorophyll meters (CM) can indicate nitrogen (N) stress in corn, but did not address whether the amount needed can be predicted. Based on 66 N rate experiments over a 4-year period in seven northcentral states, CM are highly significant predictors of economically optimum N rate (EONR). Predictions were stronger when based on relative readings, on readings made later in the growing season, and where N fertilizer had not been previously applied. Soil nitrate (NO_3^-) or soil N indices were much weaker predictors of EONR.

In irrigated corn, there are repeated opportunities to apply needed N during the growing season with irrigation water. In rainfed systems, the opportunity is more limited. The CM will only be useful in guiding N application rate if it can be the basis for a single quantitative rate recommendation.

The objective in this study was to develop calibrations to predict corn N need and yield response based on CM readings over a wide range of environments and growth stages to improve N rate recom-

mendations and inform management decisions. Minolta SPAD chlorophyll meters were used to take the readings. All readings were taken midway between the stalk and tip of the appropriate leaf. A relative CM value was calculated as: *Relative CM value* = (*CM value/reference value*). The reference CM value was specific to each experimental location and growth stage. It was calculated by averaging all readings from a group of high N treatments, instead of just the highest N rate.

The experiments included here are part of a cooperative regional research project, based on a shared experimental protocol... one of which was to evaluate the utility of CM both for predicting corn yield response to N and assessing N supply related to mineralization. The 66 N rates experiments were conducted in seven states: Illinois, Kansas, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin. **BC**

Source: Scharf, P.C., S.M. Brouder, and R.G. Hoefl. 2006. *Agron. J.* 98:655-665.

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References:

Warner, J., T.Q. Zhang, and X. Hao. 2004. Effects of nitrogen fertilization on fruit yield and quality of processing tomatoes. *Can. J. Plant Sci.* 84: 865-871.