

## Use of Chlorophyll Meters to Assess In-Season Wheat Nitrogen Fertilizer Requirements in the Southern San Joaquin Valley

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**Abstract :** Nitrogen fertilizer is the most used and often the most mismanaged nutrient input. Nitrogen management has tremendous implications on crop productivity, quality and environmental stewardship. Sufficient nitrogen is needed to optimum yield and quality. Soil and in-season plant tissue testing for nitrogen status are a time consuming and expensive process. Real time sensing of plant nitrogen status can be a useful tool in managing nitrogen inputs. The objectives of this project were to assess the reliability of remotely sensed non-destructive plant nitrogen measurements compared to wet chemistry data from sampled plant tissue, develop in-season nitrogen recommendations based on remotely sensed data for improved nitrogen use efficiency and assess the potential for determining yield and quality from remotely sensed data. Very good correlations were observed between early-season remotely sensed crop nitrogen status and plant nitrogen concentrations and subsequent in-season fertilizer recommendations. The transmittance/absorbance type meters gave the most accurate readings. Early in-season fertilizer recommendation would be to apply 40 kg nitrogen per hectare plus 16 kg nitrogen per hectare for each unit difference measured with the SPAD meter between the crop and reference area or 25 kg plus 13 kg per hectare for each unit difference measured with the CCM 200. Once the crop was sufficiently fertilized meter readings became inconclusive and were of no benefit for determining nitrogen status, silage yield and quality and grain yield and protein.

**Keywords :** wheat, nitrogen fertilization, chlorophyll meter

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