

# Determining the Most Effective Growth Stage in Corn Production for Spectral Prediction of Grain Yield and Nitrogen Response. (5898)

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## Abstract:

With the escalation in environmental concern and cost of production, researchers have recently focused on investigating more efficient means of increasing grain yield while reducing fertilizer use. This study evaluated spectral reflectance, measuring normalized difference vegetation indexes (NDVI) with a GreenSeeker® Hand Held optical reflectance sensor as a function of corn (*Zea mays* L.) hybrid, plant population, and fertilizer N rate. Initial investigation of these variables in 2002 and 2003 concluded that higher plant populations (>49,400 plants ha<sup>-1</sup>) caused early canopy closure, resulting in NDVI peaks at V10, where as NDVI did not peak at lower plant populations (35,568 plants ha<sup>-1</sup>) until R1. In the spring of 2004 with the addition of a third site and the availability of a green NDVI sensor, the trials were reconfigured removing one hybrid and imposing two more plant populations and the utilization of both green and red NDVI. Green NDVI values peaked between V7 and V8 when compared to red NDVI (peaked at V11) and green NDVI was not affected by plant population in the vegetative stages, as was red NDVI. This study indicated that N response was accurately determined in early growth stages and the potential exists to predict grain yield.

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