

PROJECT REPORT 2005

- Title:** Using an Equipment-Mounted Sensor to Optimize Nitrogen Rates for Wheat
- Investigators:** Shannon Norwood, Multi-County Extension Agent; Paul L. Mask, Agronomy and Soils; Joey Shaw, Agronomy and Soils; Chris Dillard, Agronomy and Soils
- Objective:** To evaluate the use of an equipment-mounted sensor to optimize nitrogen rates for wheat.

Procedure:

A replicated experiment was conducted at the Tennessee Valley Research and Extension Center to compare the Greenseeker N recommendation to two different nitrogen rates (80 lbs/ac and 120 lbs/ac). There were no significant yield differences among the treatments at TVREC.

A replicated test was conducted with a farmer who has variable rate fertilizer application equipment. In this test the Greenseeker technology was compared to the farmer's standard nitrogen application practice and to a treatment based on imagery. There were no significant differences between these treatments.

The Greenseeker tends to apply less nitrogen to lower tillering areas. The theory is that yield potential is already set at the time of the sidedress application; therefore, additional N (over what the Greenseeker recommends) would not contribute to yield. The Greenseeker requires the establishment of a N-rich strip, which is an area that receives the maximum amount of N early in the season (at planting is Oklahoma State University's recommendation). When it is time to sidedress, the Greenseeker measures how green the N-rich strip is and how green the remainder of the field is. The difference in greenness is used to determine the yield potential, which then indicates how much N should be applied at sidedress. The challenge with this approach is the establishment of the N rich strip. There should be a N rich strip within each field. If all of the N is applied at planting, there would be a high probability for lodging within the strip. If farmers wait until after the first of the year, then applying the N rich strip will require an extra trip to each field. Weather conditions during January-February also make the establishment of the N rich strip a challenge.