

In-season N improves yield and protein in spring wheat

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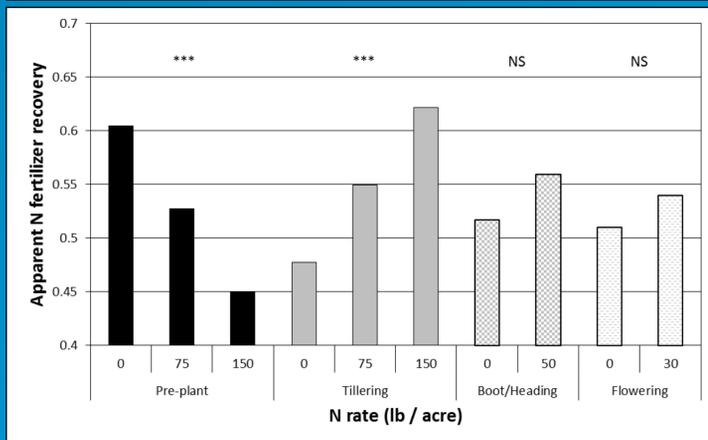
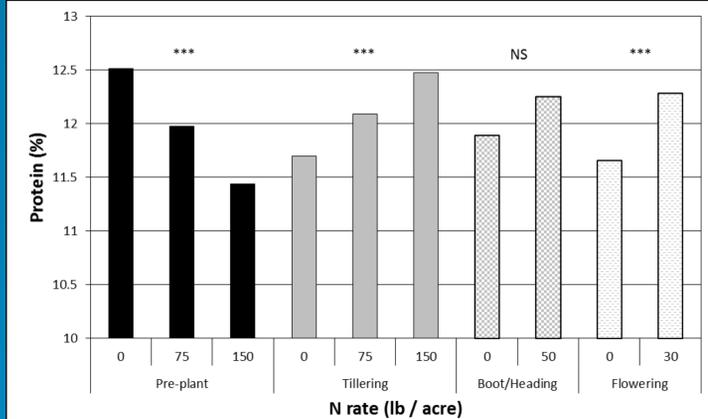
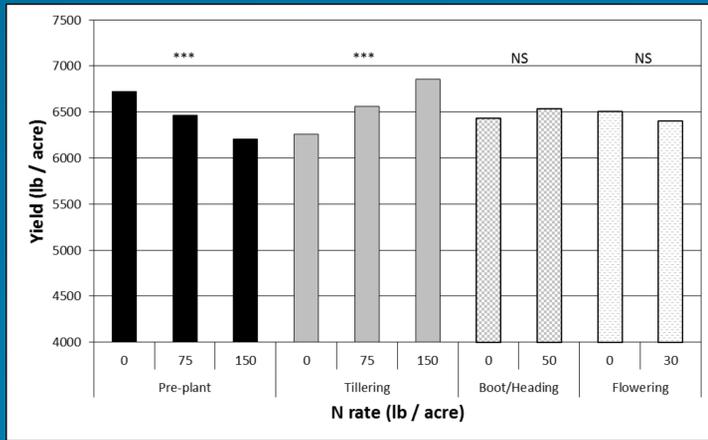


Figure 1. The effect of N fertilizer timing on YIELD (top), PROTEIN (middle), and FERTILIZER USE EFFICIENCY (bottom). Represents 4 site-years where 150 lb acre⁻¹ N was applied in different proportions PREPLANT, mid-TILLERING, at late-BOOT/early-HEADING, and at FLOWERING. For every 100 units of N applied at TILLERING instead of PREPLANT, yields increased 400lb, protein increased 0.5% and fertilizer recovery in grain increased 10%.

Proximal sensing devices can improve site-specific in-season N management



Trimble Greenseeker handheld

- NDVI (660 and 770 nm)
- Proxy for yield potential
- Retail: ≈ \$500



atLEAF chlorophyll meter

- SPAD proxy (660 and 940 nm)
- Proxy for leaf N concentration
- Retail: ≈ \$250

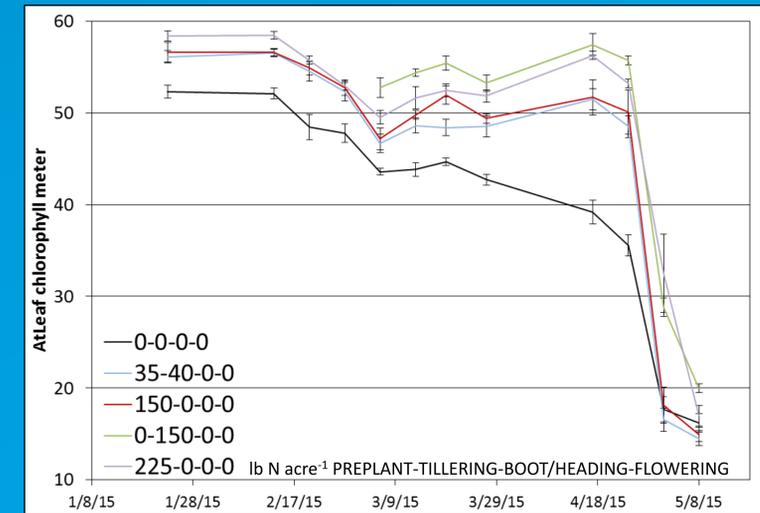
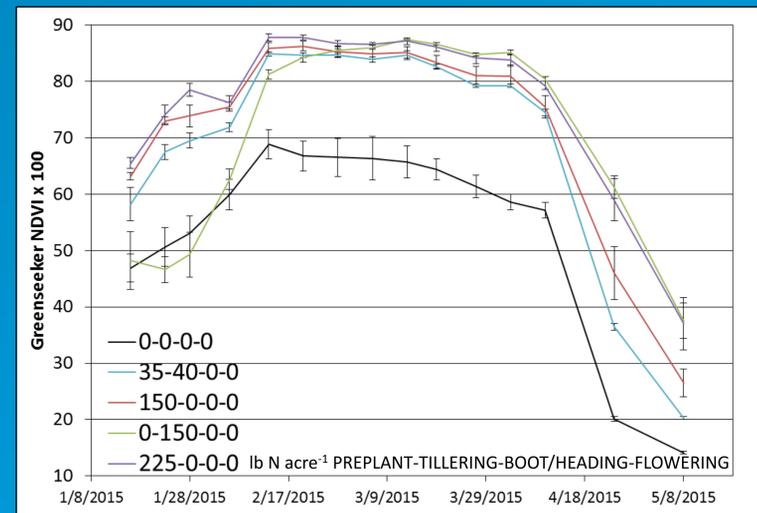


Figure 2. Changes in Greenseeker NDVI (left) and atLEAF chlorophyll meter (right) throughout the course of the 2015 season in Davis separated by variations in N fertilizer rates (lb acre⁻¹) and timing (PREPLANT-TILLERING-BOOT/HEADING-FLOWERING). Greenseeker provided more early-season information, whereas atLEAF provided more later-season information on plant N status. The tools are best used in tandem for site-specific in-season N decisions.

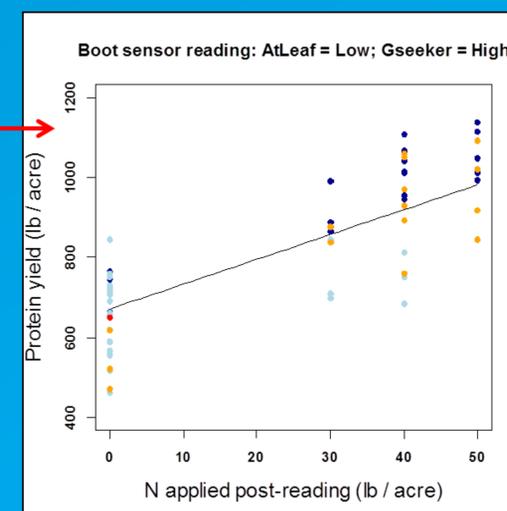
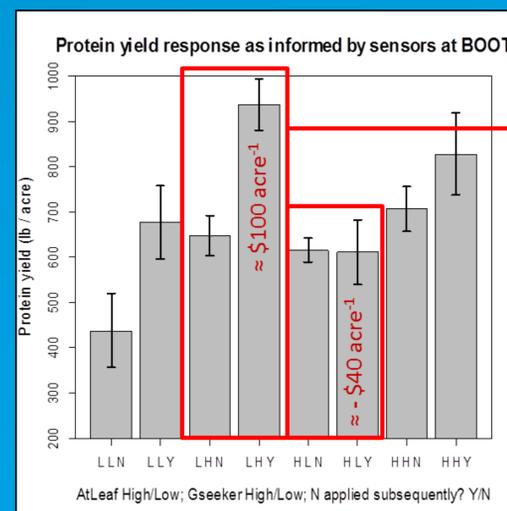


Figure 3. LEFT: Mean and standard deviation of populations separated according to whether sensor readings at boot stage were above or below (L/H) sufficiency thresholds (not shown) and whether a post-reading application of N fertilizer was applied (Y/N), for 6 site-years. RIGHT: Protein-yield response to a post-reading application of N when atLEAF reading was below (L) and Greenseeker reading was above (H) sufficiency thresholds.

ACKNOWLEDGEMENTS

Our thanks to the California Wheat Commission and the California Department of Food and Agriculture Fertilizer Research and Education Program for their partial funding this research. Thanks as well to the staffs of the Westside REC, Intermountain REC and the UC-Davis Agronomy Farm, and the following individuals who contributed to the research: Ryan Byrnes, Jason Tschlis, Phil Mayo, Gerry Hernandez, Lalo Banaelos, Israel Herrera, Emma Torbert, Rika Fields, Katy Mulligan, Eric Lin, Dan Putnam, Chris de Ben, & Israel Herrera.

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