Pre-Season Nitrogen-Rich Strips and Response Index as a New Strategy for Fertilizer Management. (A04-johnson095640-Oral)

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Abstract:

Results of long-term (15 to 30-yr) field research show average nitrogen use efficiency (NUE) decreases with each increment of N fertilizer added and is only 35 percent for dryland winter wheat and 25 percent for irrigated corn at the average N rates for maximum yield. Poor NUE is associated with the practice of N applied preplant and the inability to predict yield potential and available non-fertilizer N. Annual differences in crop use of non-fertilizer N were greater than differences in yield potential for both cropping systems. Farmers traditionally apply N based on the assumption yield potential is unchanged over time and non-fertilizer N contributions are constant and minimal. Use of a spreader-width strip of N applied preplant, at a rate to be non-limiting in fields that receive minimal preplant N, allows in season adjustments that account for seasonal variability. In-season measures of NDVI using a hand-held sensor were used to calculate expected N response (RI). Results from 10 field scale treatments show an advantage of 4 to 9 dollars per acre, in a year of drought and delayed topdressing. The strategy has application for all non-legume crops.

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