Supplemental Late-vegetative N Applications for High-yield Corn: Agronomic, Economic, and Environmental Implications with Modern versus Older Hybrids

Performance comparison of old versus new corn hybrids

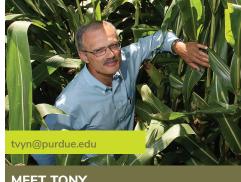
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Collaborators: Alicia West, field and laboratory technician, Purdue University. Dr. Rex Omonode, research scientist, Purdue University. Sarah Mueller, Ph.D. graduate student, Purdue University. Undergraduate students from Purdue University





MEET TONY

Tony has always been interested in testing and identifying cropping systems that increase nutrient efficiency and challenge to simultaneously improve farmer profitability unit of crop production.

He also enjoys training graduate students and the next generation of crop and plant nutrition scientists.

"My parents immigrated to Canada from the Netherlands and bought a farm after working for other Canadian farmers for 10 years. Most of my youth was children, and one of them farms in Texas. I am grateful to my parents and mentoring professors for encouraging me to continue my education."

Tony's research portfolio includes no-till and strip-till with alternate phosphorus and potassium placements for corn, as well as trying to understand the mechanisms for corn hybrid improvements in nitrogen use efficiency over time. "Financial support from the fertilizer, seed and equipment industries over the years has helped

PUBLISHED REPORTS

PROJECT GOALS SOURCE All urea ammonium nitrate **RATE** Different rates of total N applications from 0 to 240 pounds N/acre TIME Comparing N applied at standard side dressing time and a split side dress with a pre-tassel N application PLACE All sidedress fertilizer banded with injection, late-split N banded on soil surface or injected into soil in bands between the corn rows.

PROJECT RESULTS

Modern hybrids continue to accumulate N later in the growing season.

SOURCE Same source

RATE

Experiments in progress, N recovery efficiency by corn improves at the lower total N rates that are more feasible with a late-split N approach.

TIME

Review of the literature indicates that New Era hybrids look to benefit more from later season applications of N as more of the N in the grain is taken up during the post silking growth stage; fertilizer N recovery is higher when the same total N rate was applied with both side-dress and late-split timings.

PLACE

Late-split N was available to plants whether injected or surface applied when rainfall was not limiting.

WHAT DO WE DO NEXT?

- Evaluate the results of the field studies underway and determine new fertilizer timing recommendations. Study hybrid era impacts on corn's ability to recover from mid-season N deficiency.
- If funding is available, examine how changes in timing of N application(s) may change N loss to water and air.
- Relate the nitrous oxide losses during the growing season with different N timings and rates to the whole-plant N recovery during the growing season.