

Efficient Fluid Fertilizer Management for Corn Producers with Automatic Guidance Systems

Tony J. Vyn



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John Deere & Co.

In-kind Laboratory Analysis:

Waters Agricultural Laboratories, GA

Equipment:

John Deere Cropping Systems Unit

Case-DMI (Goodfield, IL)

Seed: Pioneer Hi-Bred, Int.

RTK Automatic Guidance



RTK Guided Strip Tillage and N application



Source: Norm Larson, Elburn Co-op, IL

RTK + Pre-plant UAN Application 2006-2007



RTK Planting after Pre-plant UAN

(West Lafayette, 2006)



Treatment Description for RTK Guided Row Positions Relative to Pre-plant UAN

- UAN rates (0, 50, 100, 200 N per acre)
- Positions (0", 5", and 10" from UAN band)
- Two locations in 2006-2007: 1. Wanatah (loam), and 2. West Lafayette (silty clay loam)
- Third location in 2007: Lafayette, IN (silt loam)
- Starter versus no starter split at West Lafayette and Lafayette: 10-34-0 at 220 pounds/acre.
- Starter at Wanatah: 19-17-0 at 125 pounds/acre
- All treatments received a total of 200 pounds of N as UAN (whether pre-plant and/or early sidedress)

RTK and Pre-plant UAN at Wanatah, IN



50 N at 0'' versus 200 N at 0''



100 N at 0'' versus 100 N at 10''

RTK and Pre-plant UAN at Wanatah, IN, 2006

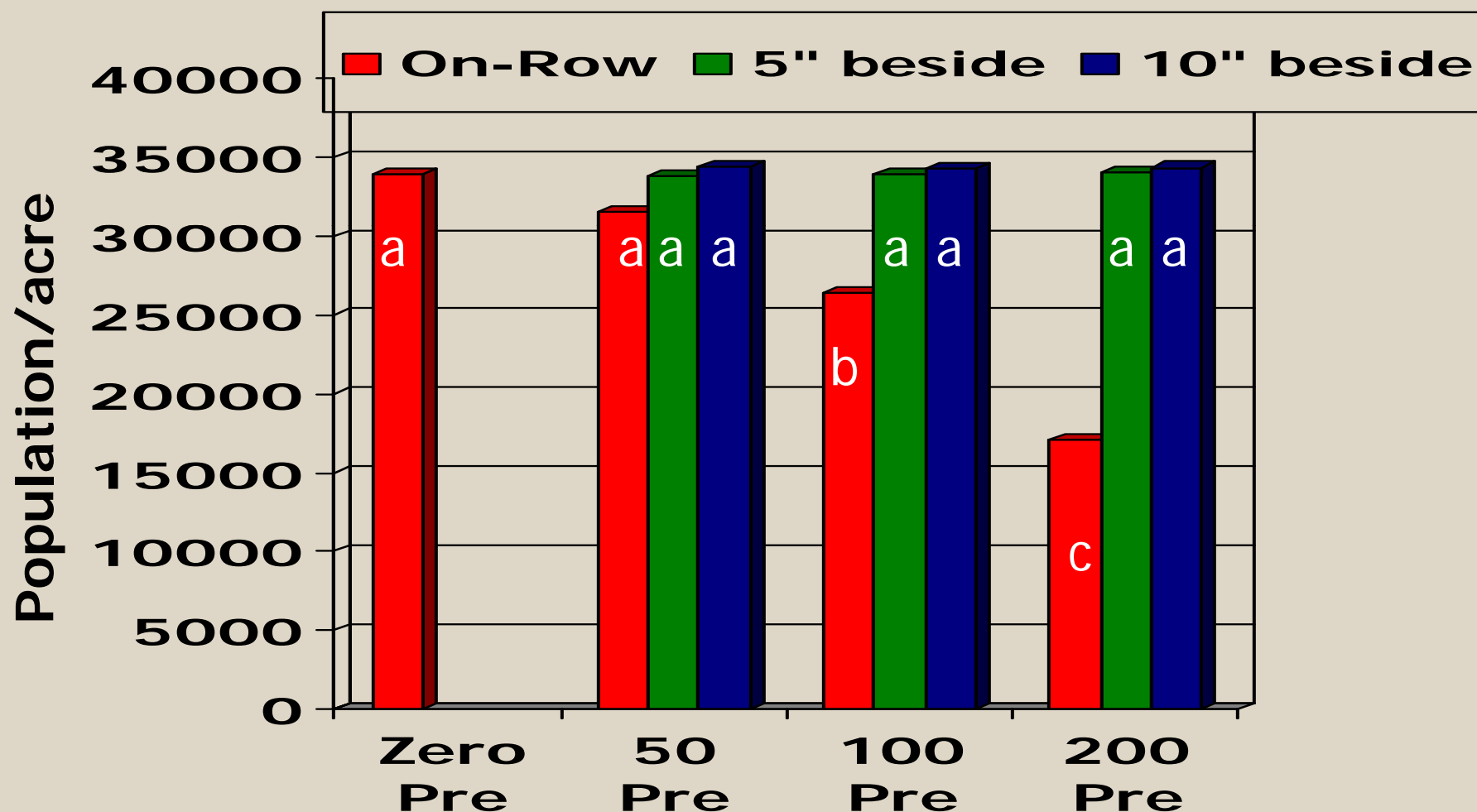


200 N at 5'' versus 200 N at 0''



**200 N at 5'' (background) vs.
200 N at 0'' (foreground)**

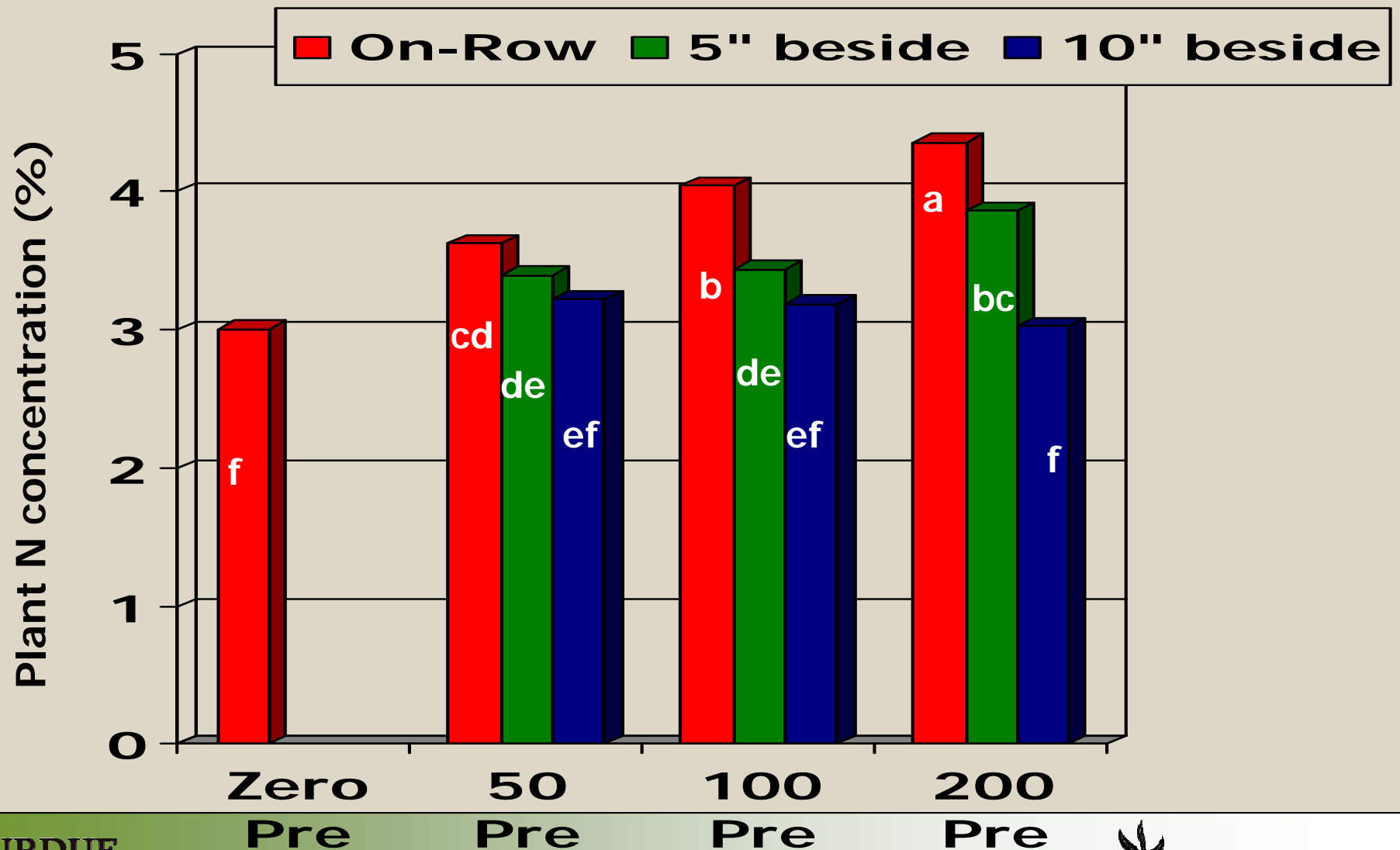
RTK Row Position Effects on Plant Population Response to Pre-Plant UAN Rates Wanatah, IN, 2006-2007



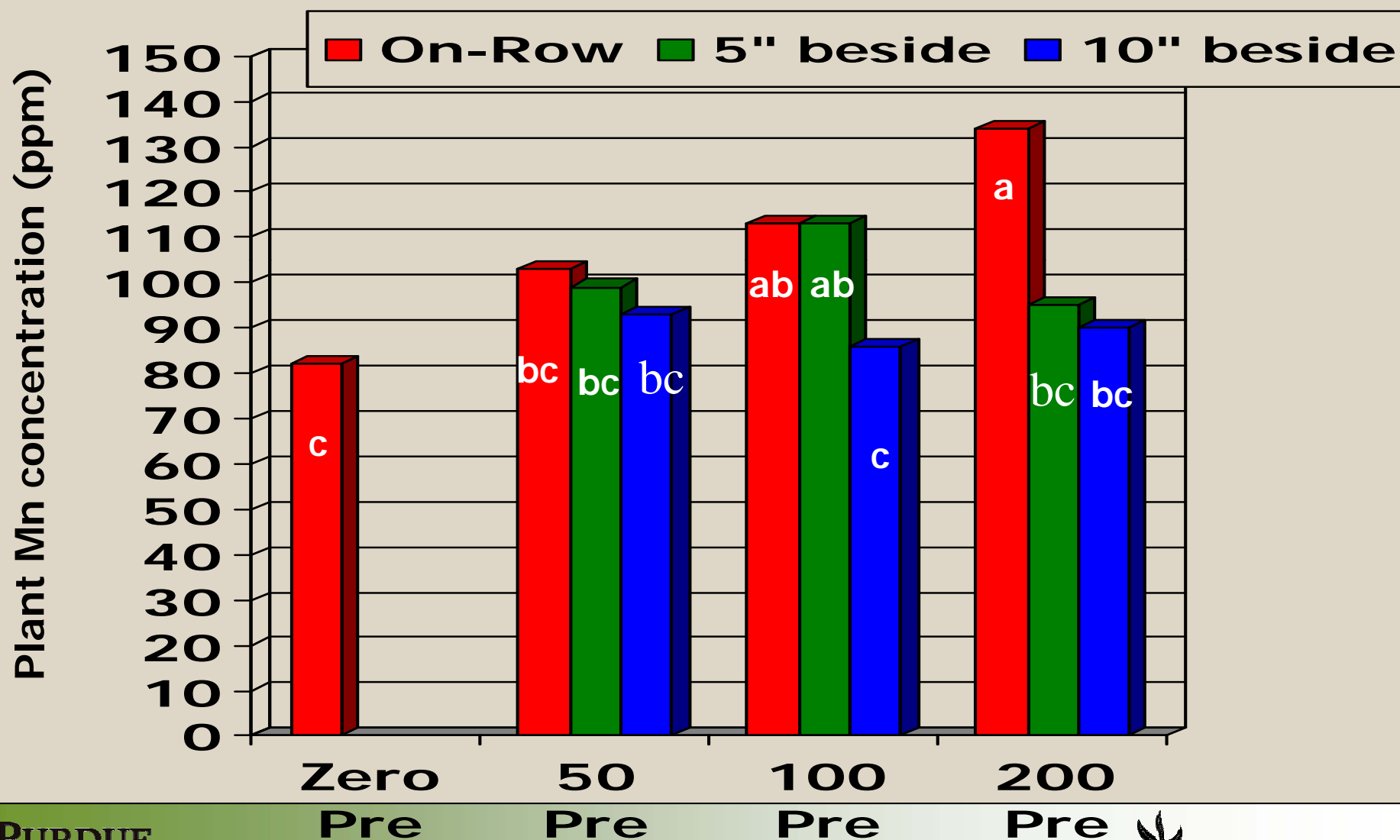
RTK Row Position & V8 Plant N Concentration (%)

Response to Pre-Plant UAN Rates

Wanatah, IN, 2006-2007

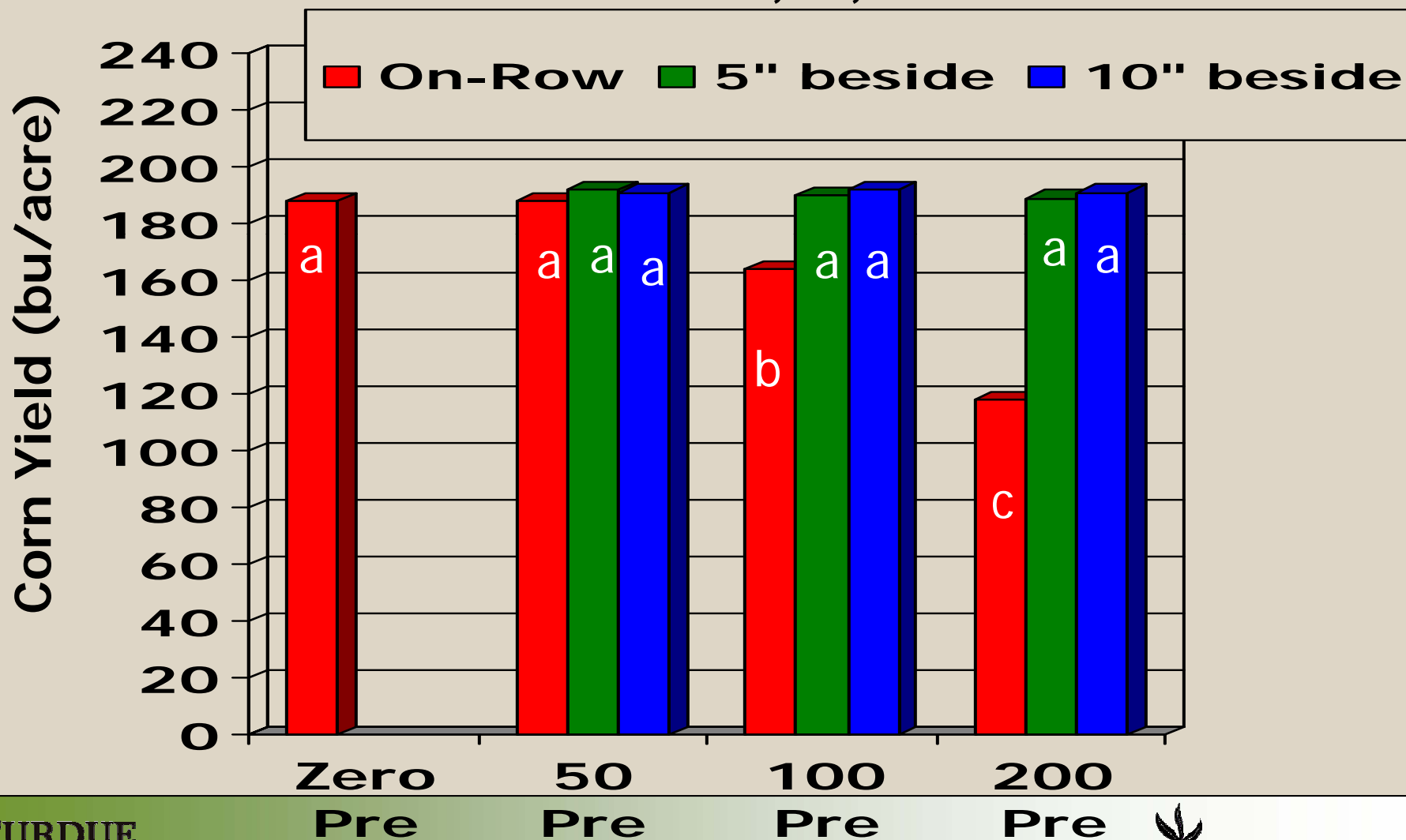


RTK Row Position & Plant Mn Concentration (ppm) Response to Pre-Plant UAN Rates Wanatah, IN, 2006-2007



RTK Row Position Effects on Corn Yield Response to Pre-Plant UAN Rates

Wanatah, IN, 2006-2007



RTK after Pre-Plant UAN at West Lafayette



200 N @ 0" w/o & w Starter



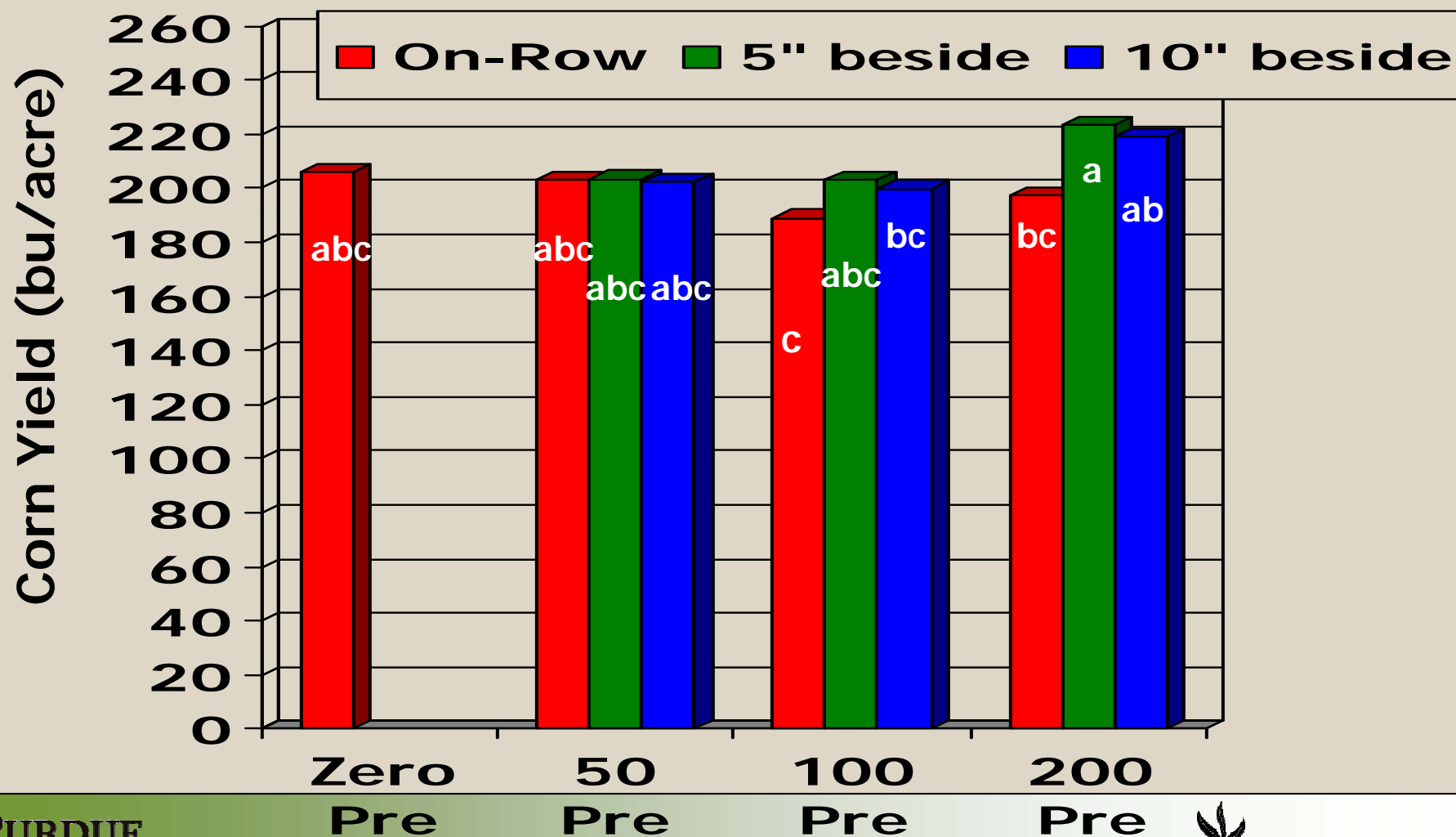
200 N @ 0"



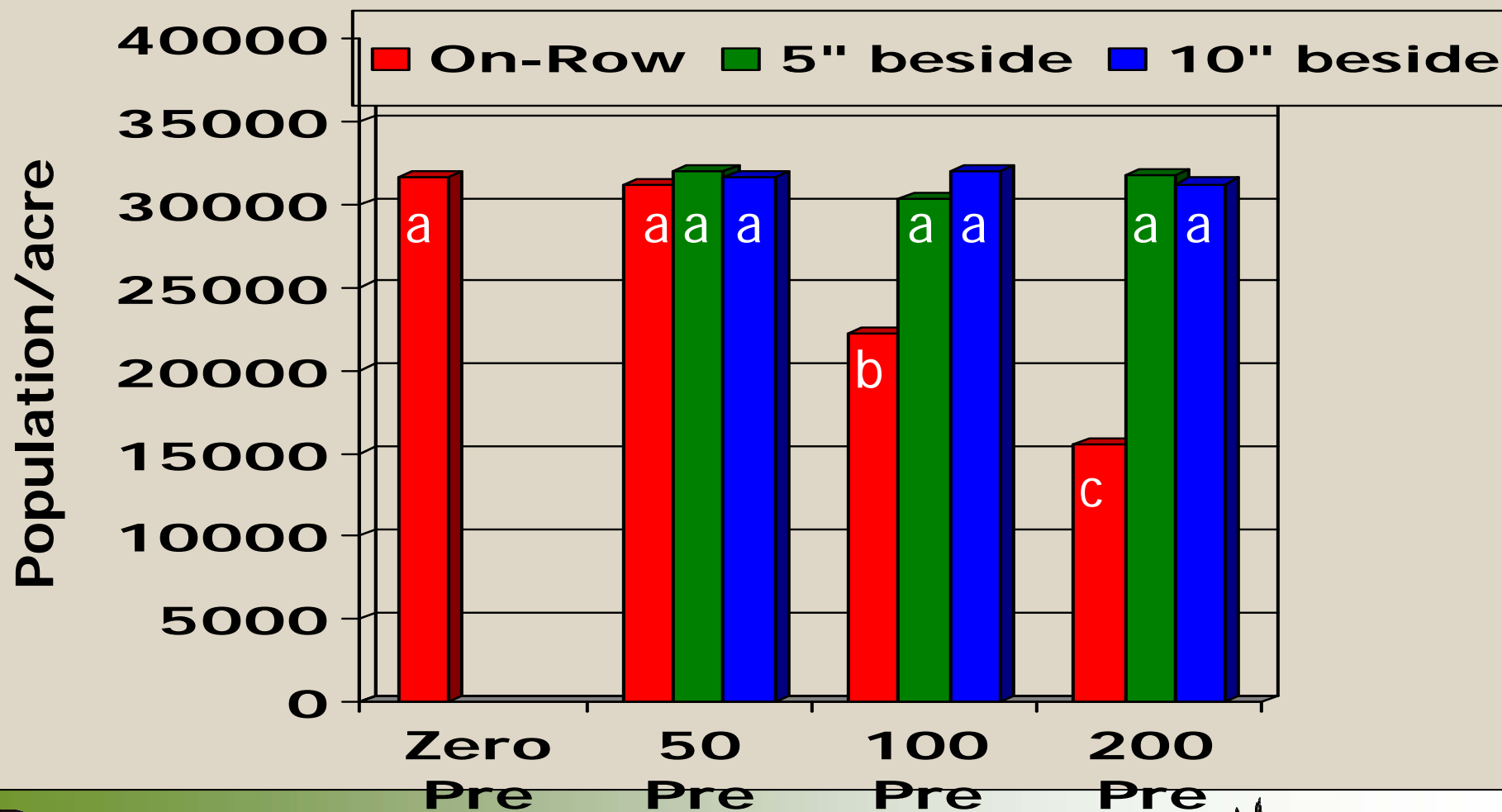
200 N @ 10"

RTK Row Position Effects on Corn Yield Response to Pre-Plant UAN Rates (With Starter)

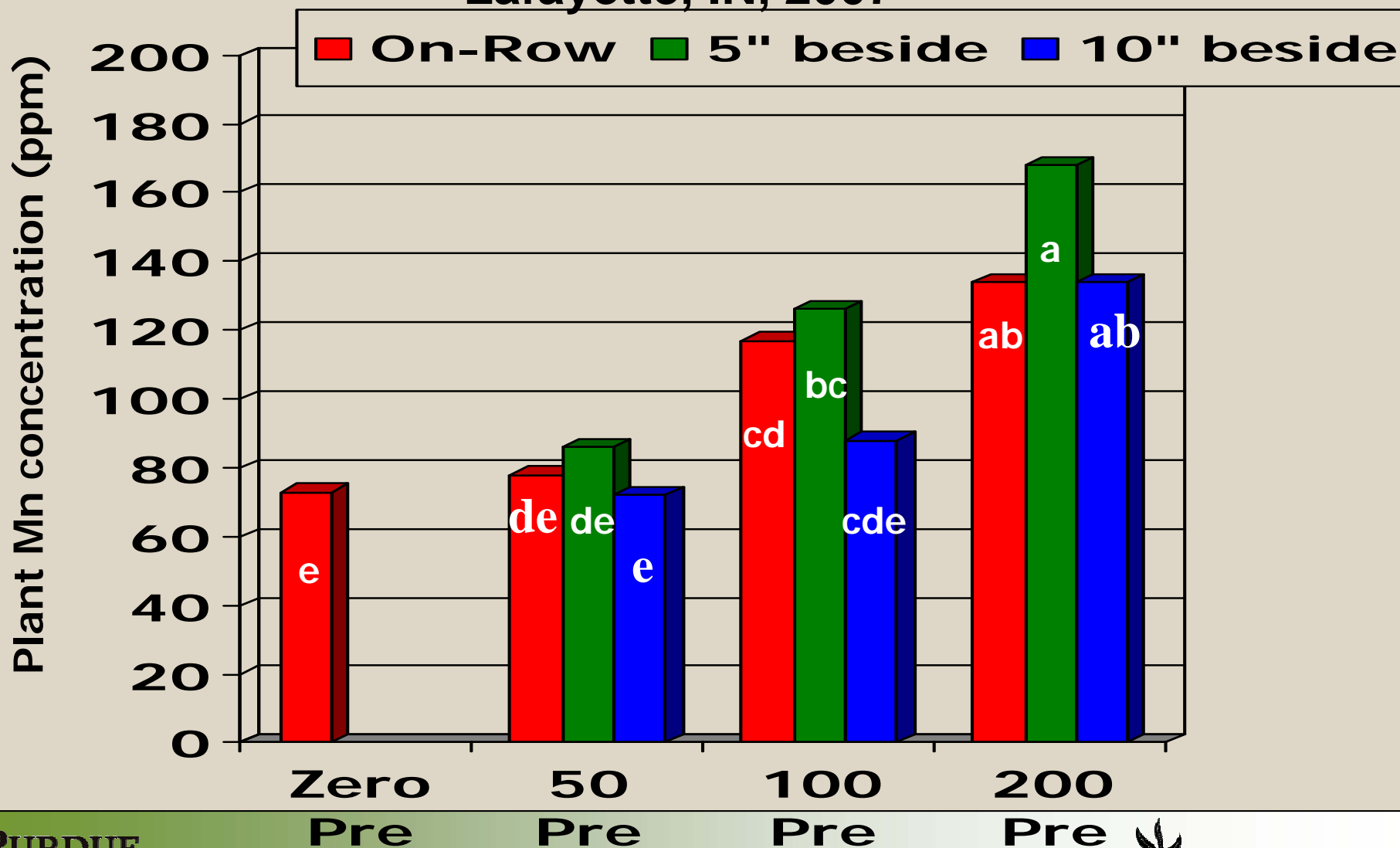
West Lafayette, IN, 2007



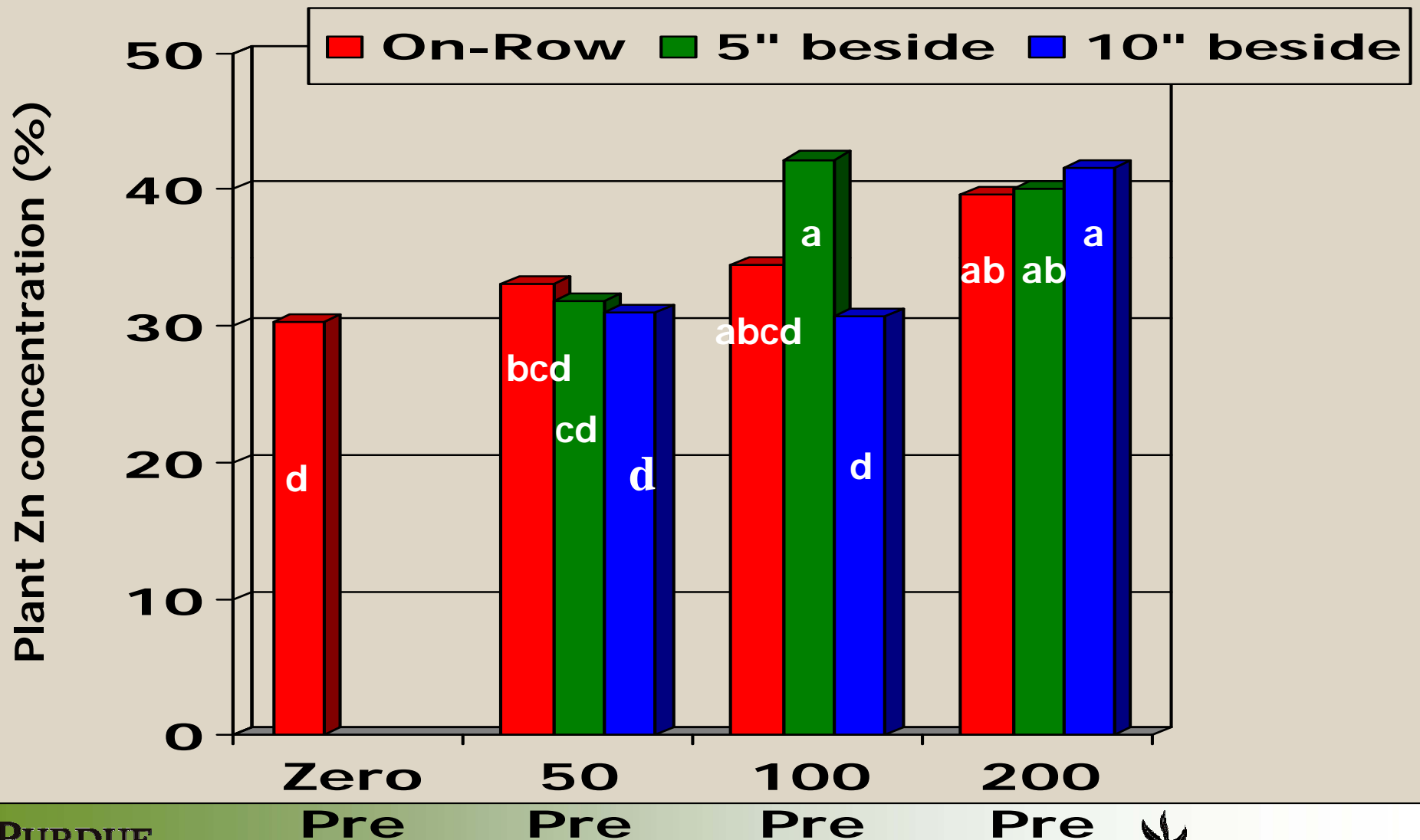
RTK Row Position Effects on Plant Population Response to Pre-Plant UAN Rates Lafayette, IN 2007



RTK Row Position & V8 Plant Mn Concentration Response to Pre-Plant UAN Rates Lafayette, IN, 2007

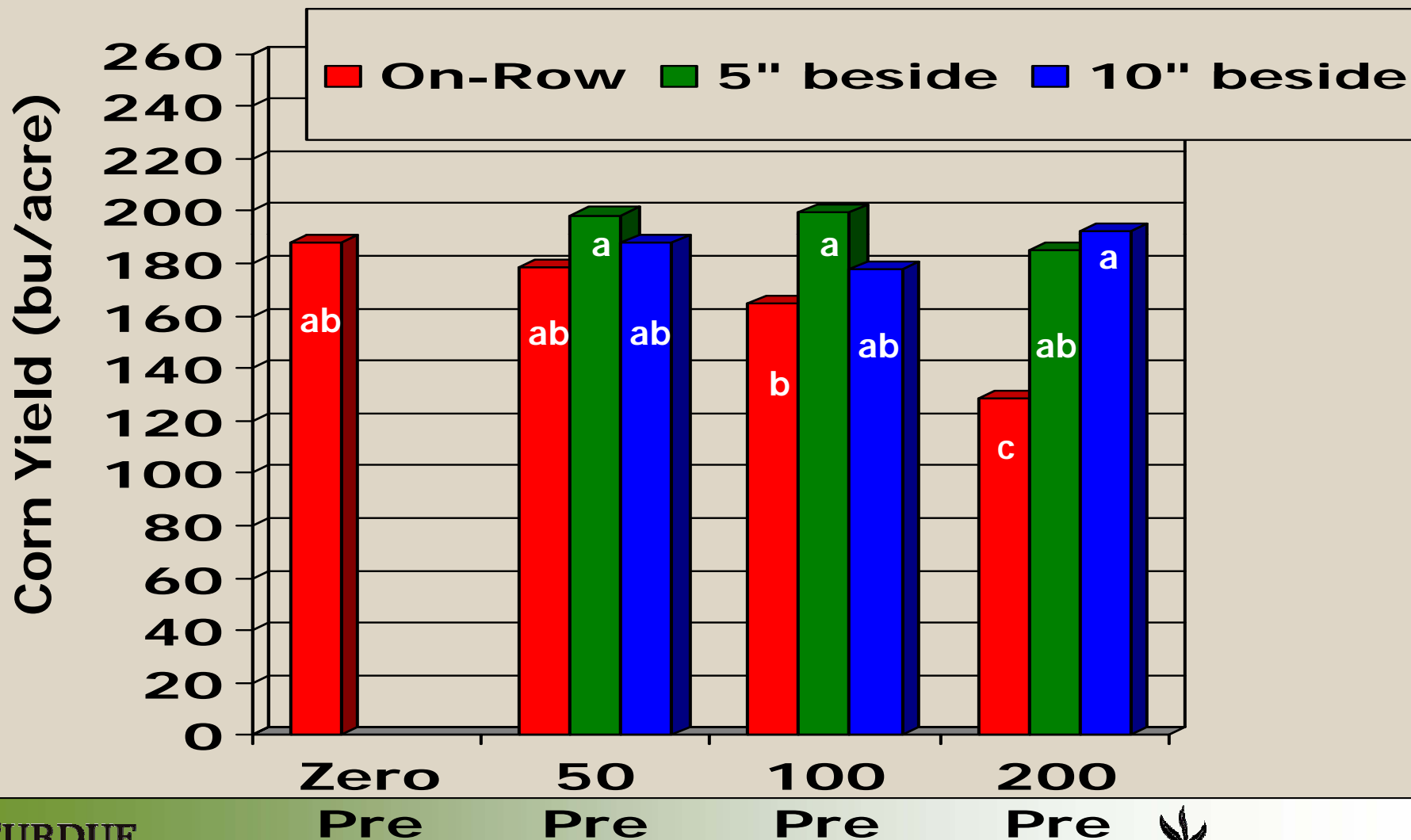


RTK Row Position & Plant Zn Concentration Response to Pre-Plant UAN Rates Lafayette, IN, 2007

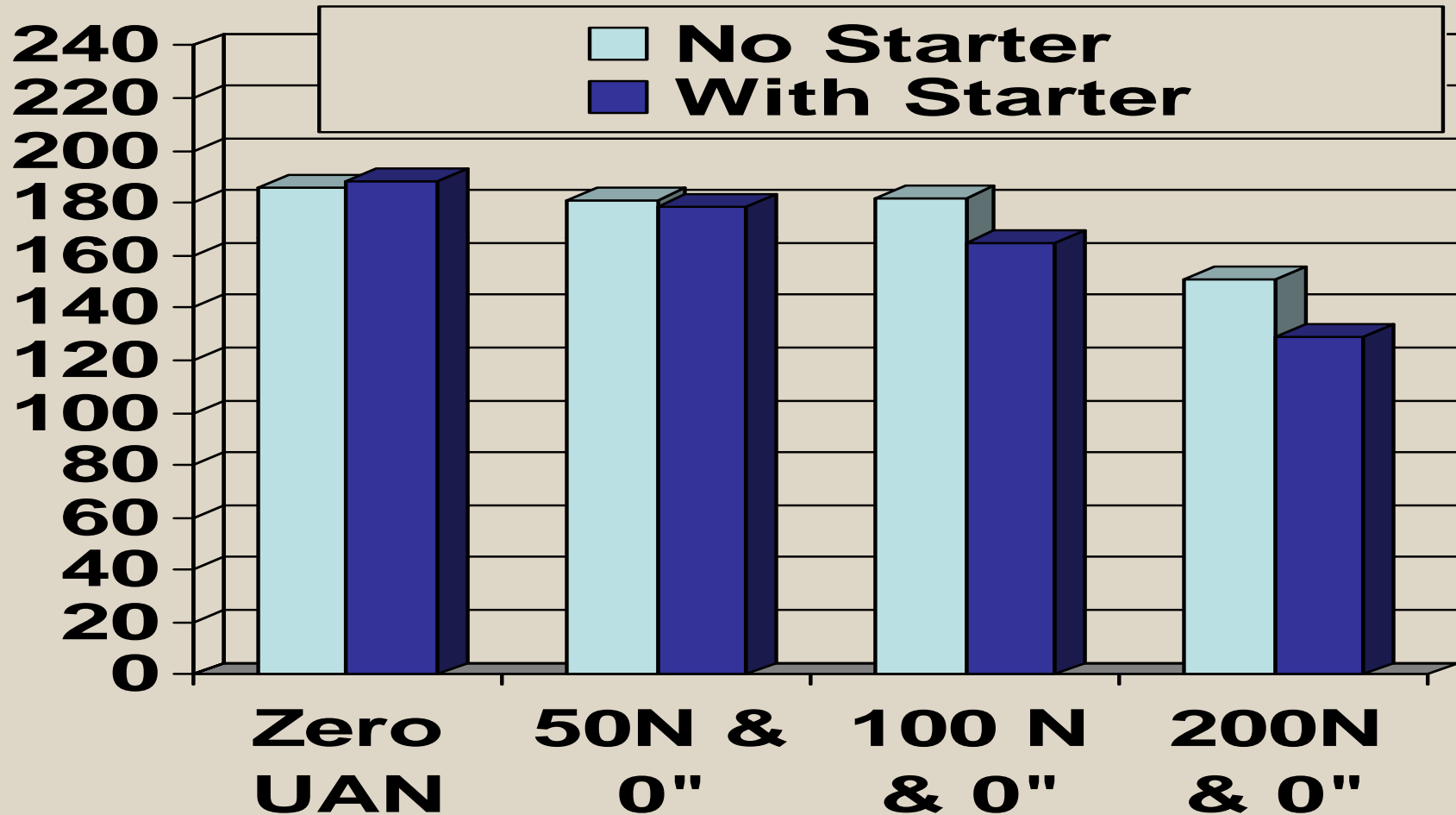


RTK Row Position Effects on Corn Yield Response to Pre-Plant UAN Rates (With Starter)

Lafayette, IN, 2007



Starter Influence on Corn Yield Response to Row Position at 3 N Rates in 2007



Conclusions

- 1. RTK precision offers advantages for corn planting after pre-plant UAN application (population, yield)**
- 2. When pre-plant N rates in the form of UAN exceed 50 pounds/acre, corn rows 5” to the side are “safer” than those directly over the UAN band.**
- 3. Corn response to row position relative to pre-plant UAN bands may also depend on starter formulation and rate.**
- 4. UAN rate and relative RTK row position also affect micronutrient concentrations in young corn plants.**

Thanks!

tvyn@purdue.edu

home page:

[//www.agry.purdue.edu/staffbio/vyn](http://www.agry.purdue.edu/staffbio/vyn)

