In-Furrow Placement of Enhanced Urea Products with Wheat

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- Traditionally pre-plant N was applied with tillage
- Large percentage of acres seeded with air-carts
- Producers continually asking about in-furrow urea
Rationale

• Current KSU recommendations allow for 20 - 30 lbs ac\(^{-1}\) nitrogen with the seed when in 7.5 – 10” spacing
• However we recommend no seed placed urea
• Research in the Northern Great Plains and Prairie Provinces indicates the use of urea and urea products may be possible

A moment for clarification...

• This study was not designed to evaluate wheat response to N timing, source or placement
• Our objective was to evaluate potential stand reduction and its effect on yield
• A full nitrogen program was performed in-addition to our use of in-furrow urea
In-Furrow Urea Materials and Methods

- Western Sites: No-till into chem-fallow, Certified CSU-Byrd, target 1.05 million seeds/ac
- Hunter 2017: No-till into wheat stubble, Certified KSU-Larry
- Treatments were in addition to grower practice Factorial (4 rates x 3 products, plus two controls)
  - 10, 20, 30, 60 lbs/ac N as ESN, NBPT+NPPT (Limus), or Urea
  - MAP to get 10 lbs/ac N (91 lbs/ac of MAP)
  - Control (no in-furrow product)
- Row spacing was 7.5” in 2016 and 2017, 10” in 2018
In-Furrow Urea Materials and Methods

• Measurements
  Fall stand count  Spring Stand Count
  Head Counts  Grain Yield and Protein

• Across-years analysis conducted with Proc GLIMMIX
  Treatment: one-way fixed effect
  Replication(Site-Year): random effect
  LSD means separation with PDMIX800

Visual – Mitchell Co. 2/9/17
60 lb/ac Urea  60 lb/ac ESN
Effect of In-Furrow Urea Product and Rate on Winter Wheat Stand at Green-up

Site-Years = 3
Error bars represent LSD(0.05) of a one-way treatment analysis, P=0.0004

Effect of In-Furrow Placed Urea Product and Rate on Heading Date
(Tribune 2016 and Herndon 2018)
Effect of In-Furrow Placed Urea Product and Rate on Kernel Weight
Average Across 9 Site-Years

Nitrogen Applied, lb ac⁻¹

Effect of In-Furrow Placed Urea Product and Rate on Winter Wheat Grain Yields
Average Across 9 Site-Years

Lbs of N / acre applied
Summary

• In general our data would suggest we could place up to 10 lb ac\(^{-1}\) of urea in-furrow
  – However, at 2 of 9 site-years (Tribune 16, Colby 16) yields were reduced by 7 bu ac\(^{-1}\)
• Across site-years NBPT+NPPT did not reduce yields up to rates of 30 lb ac\(^{-1}\)
  – some individual site-years did see reductions
• Across site-years ESN at 60 lb ac\(^{-1}\) did not reduce yield relative to the control
• ESN was never detrimental at the 30 lb ac\(^{-1}\) rate
Conclusions

• ESN and NBPT+NPPT coated urea provides some safety over untreated urea when used in-furrow in western Kansas
• Not enough site-years yet to truly evaluate the risk of various levels
• Rates of 10, 20, and 30 lb ac\(^{-1}\) for urea, NBPT+NPPT, and ESN appear to be safe in most instances

Questions and Discussion

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