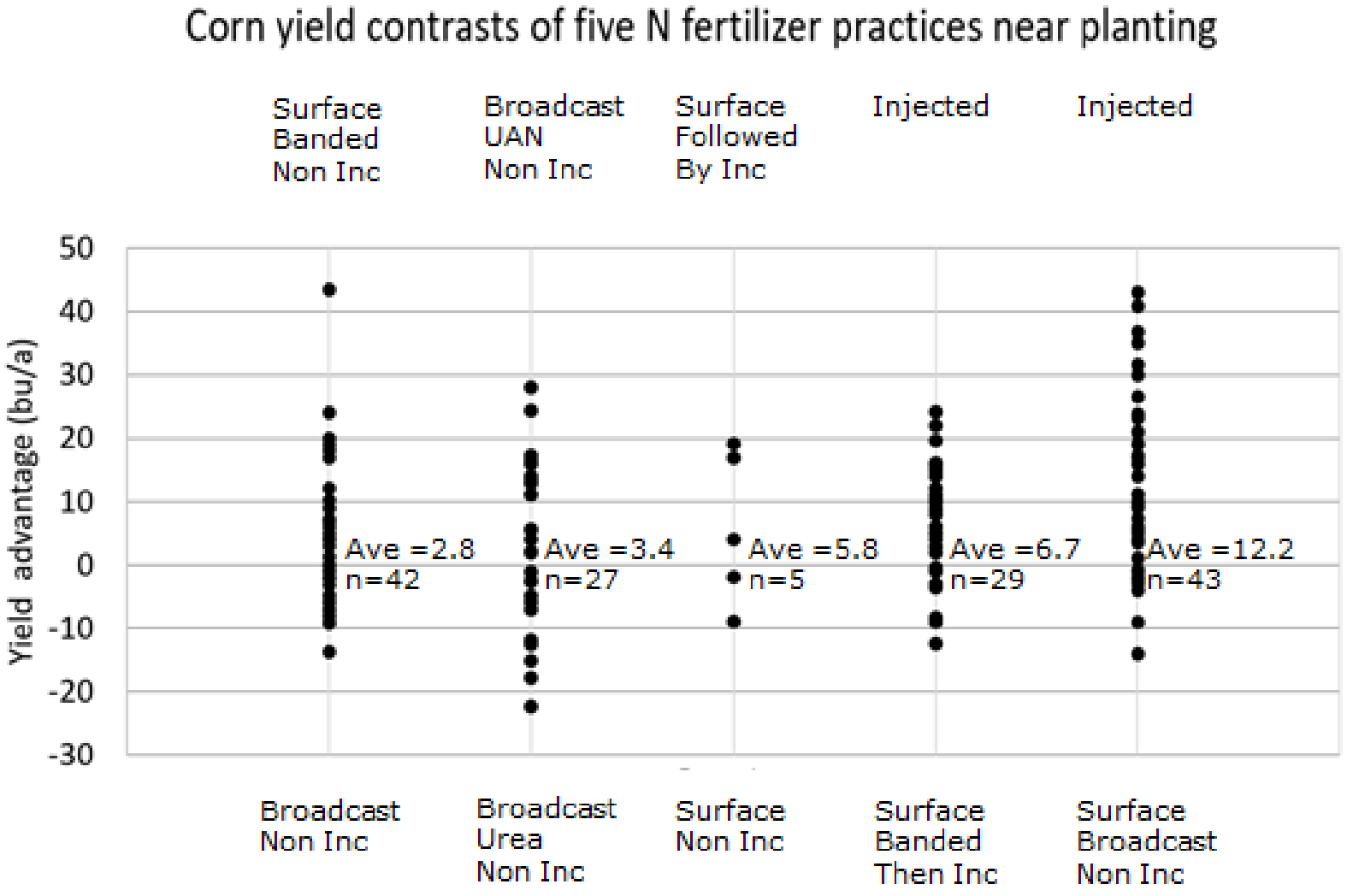
INNOVATION THAT GROWS

Planter-applied Fertilizer Systems

2022 Fluid Fertilizer Foundation Technology Workshop

Brad Van De Woestyne

Nitrogen Fertilizer Form and Placement

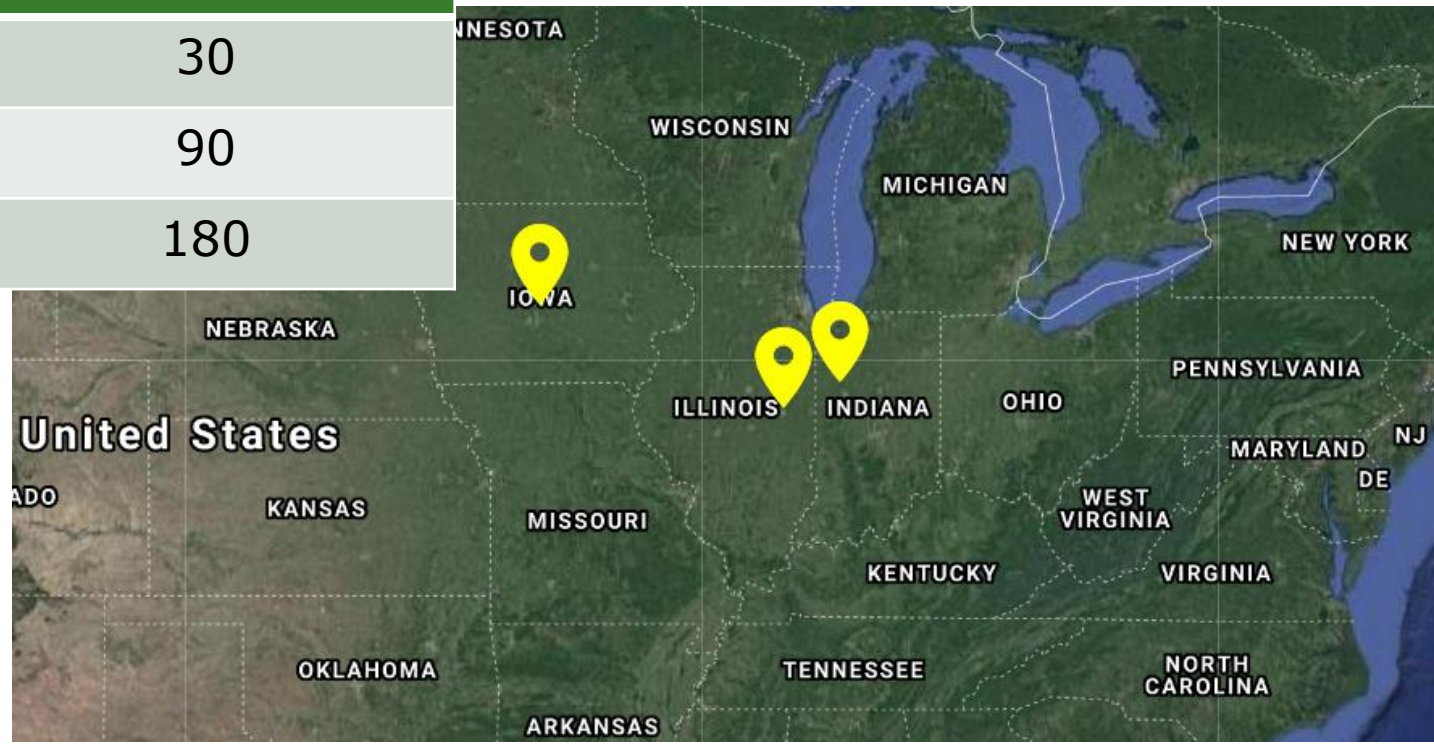


Key Takeaways:

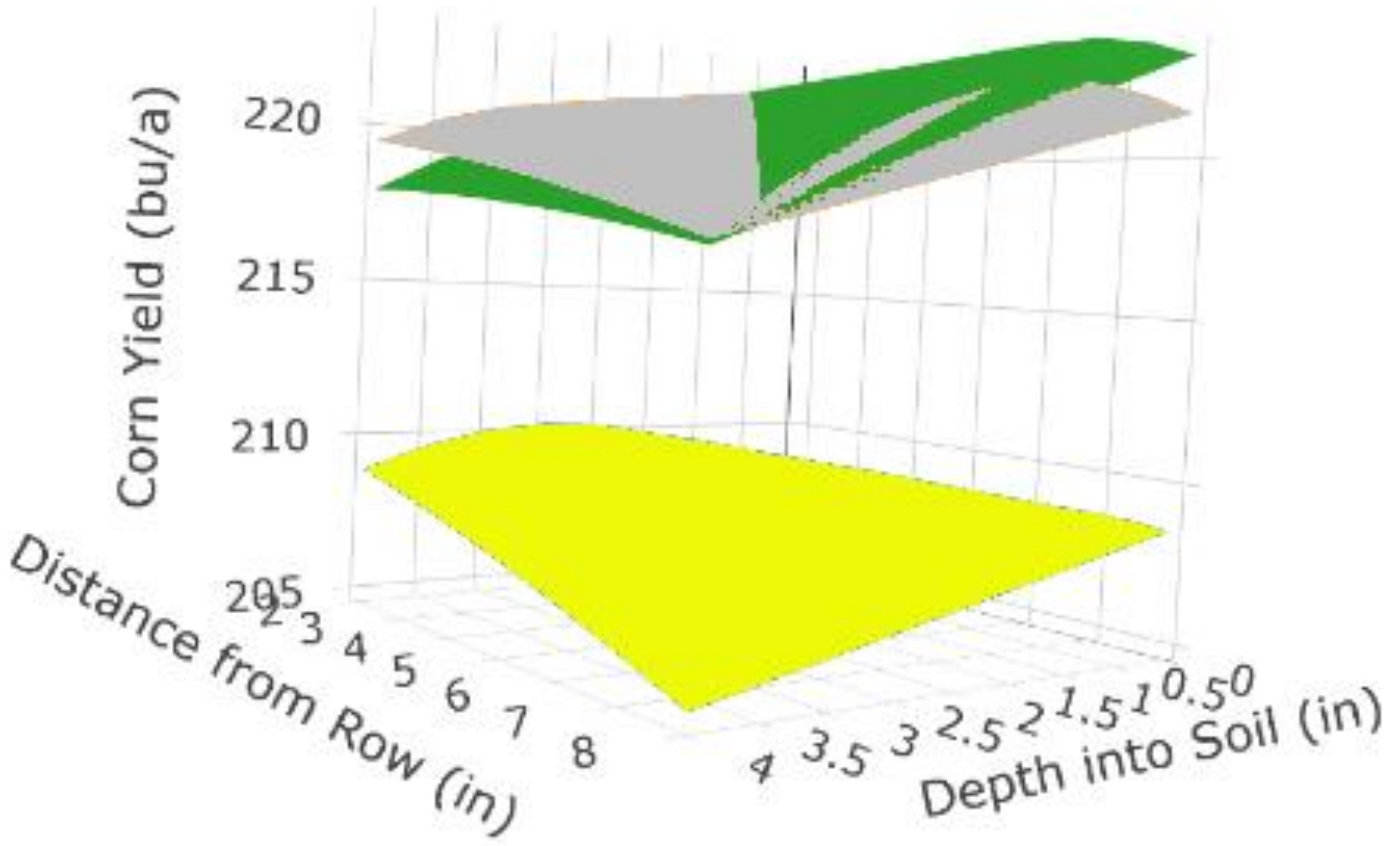
- Literature review 13 scientific articles from 12 states
- Each dot represents one site-year comparing forms and placements
- Results show injected nitrogen better than surface or surface and incorporated UAN or Urea

Field Trials

Depth from Surface (inches)	Distance from Row (inches)	Rate of N at Planting (lbs N/a)
0	2	30
2	5	90
4	8	180



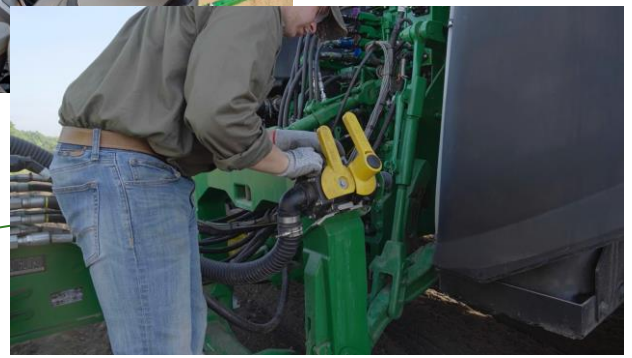
Results

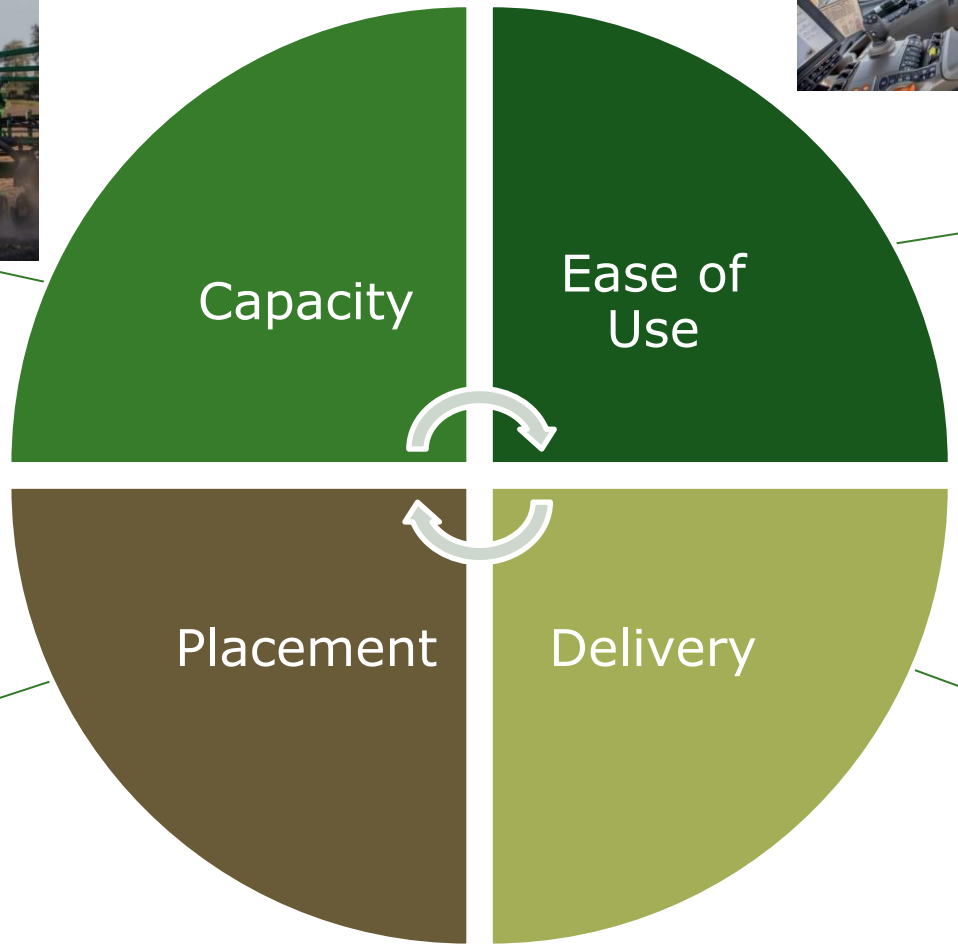


Key Takeaways:

- Fertilizer placement from the row and depth into soil minor
- Rate of fertilizer most significant response

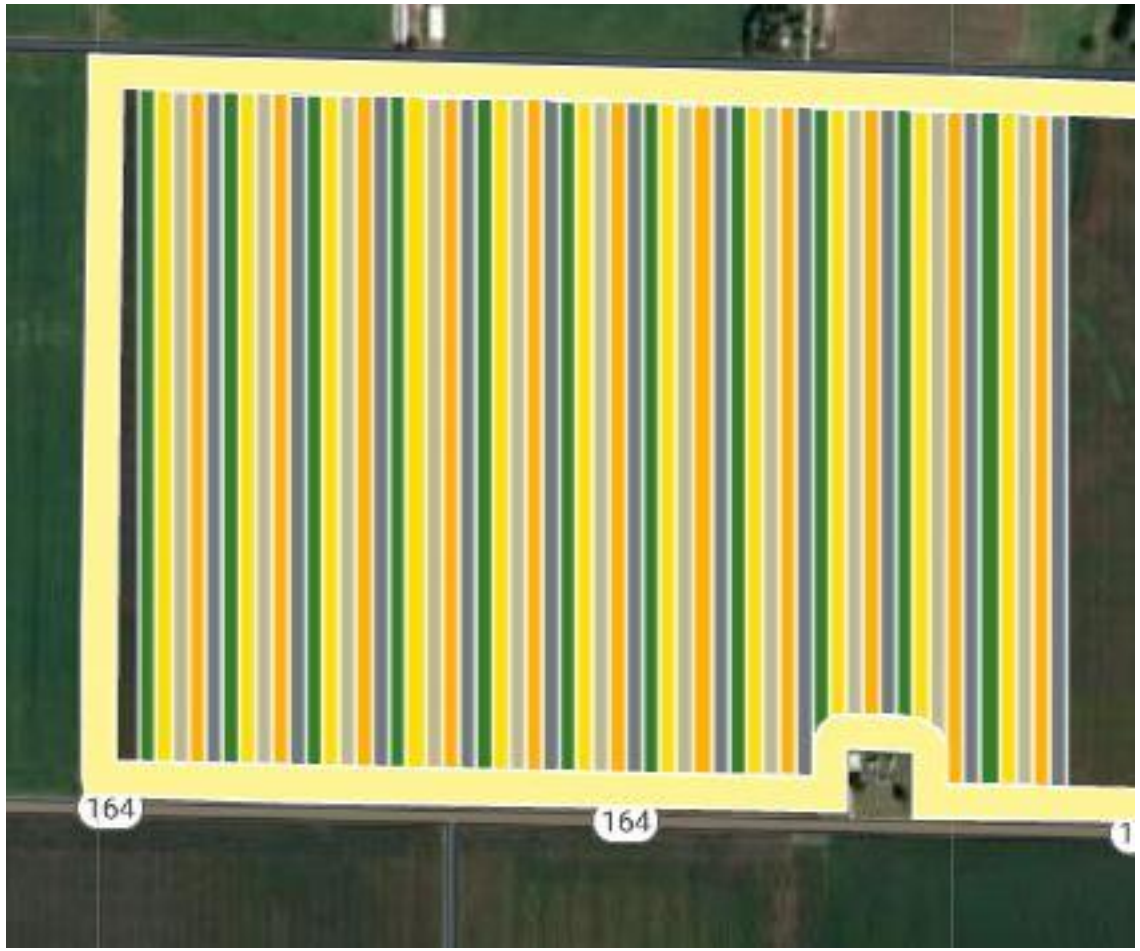
Planter-applied Fertilizer Challenges





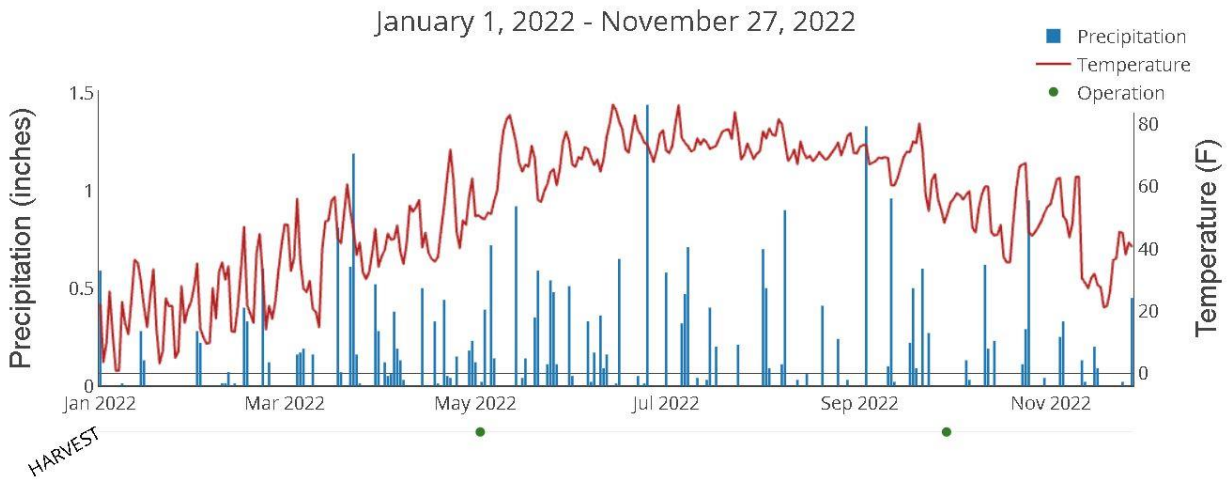
In-Furrow Fertilizer

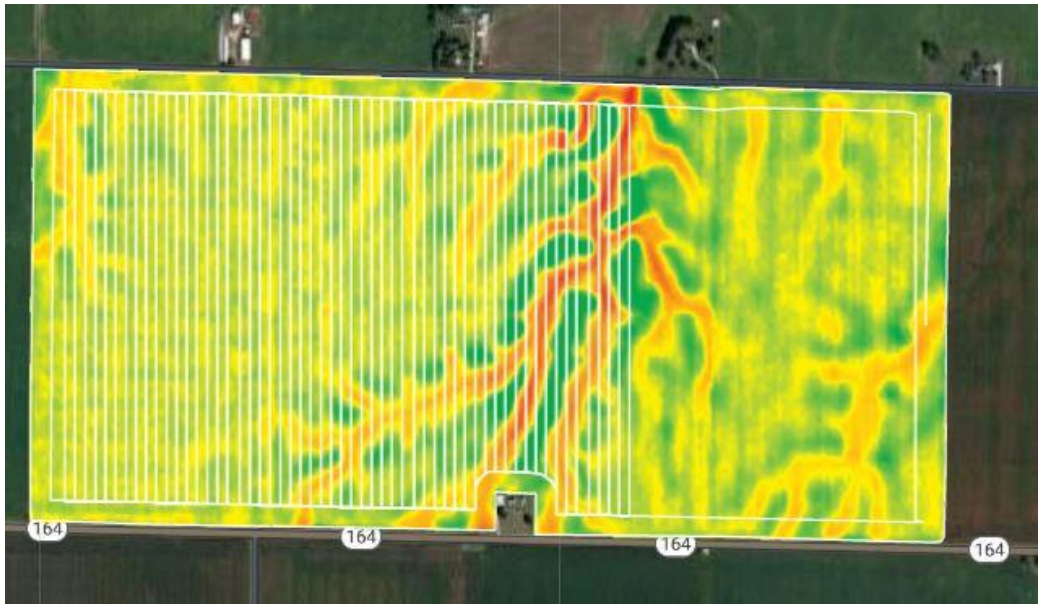
Protocol

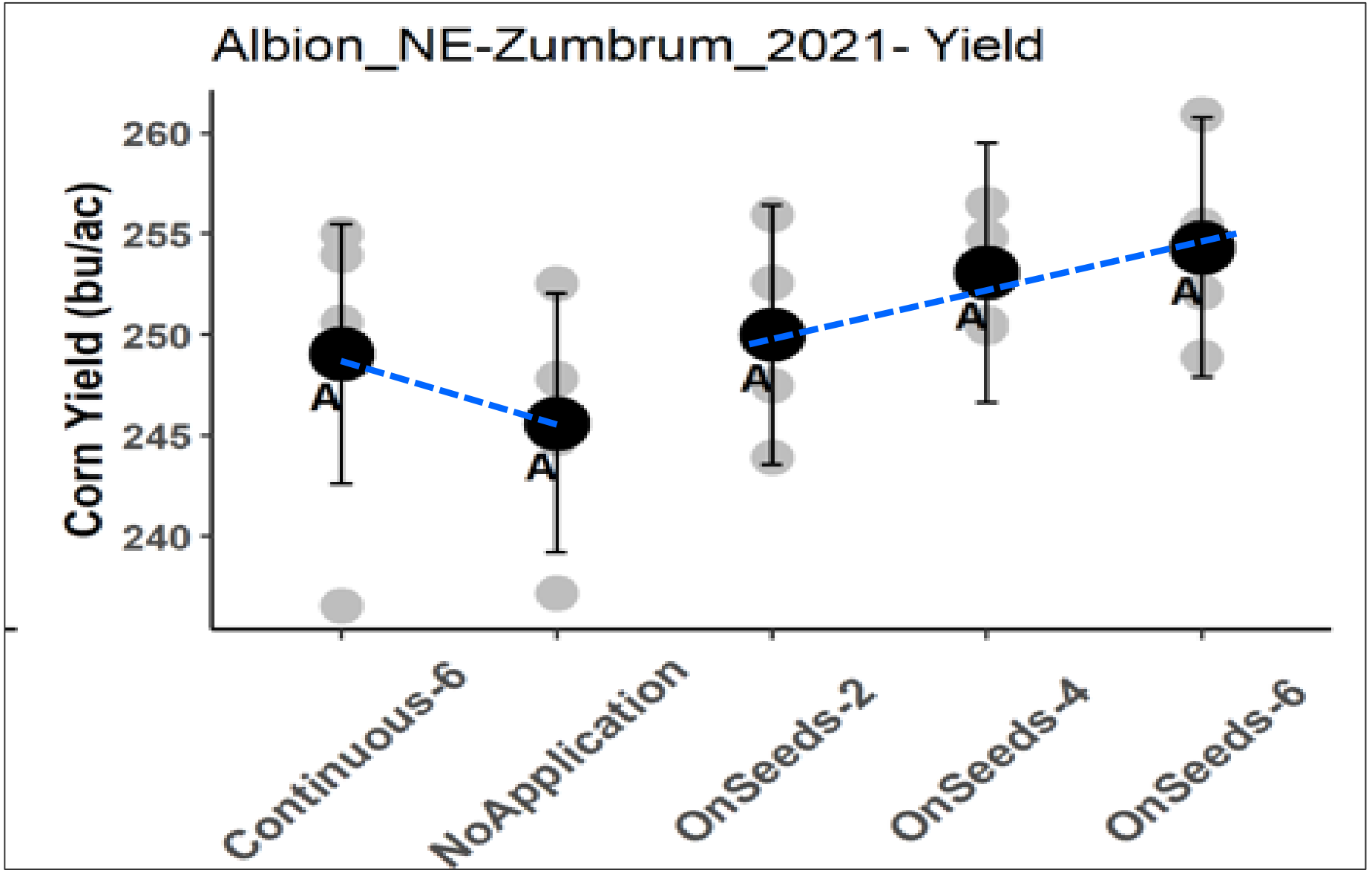


	Trt	Fertilizer placement at planting	Starter Fertilizer Rate (gal/ac)
	1	In-Furrow - Continuous	6
	2	No Application	0
	3	In-Furrow - On Seeds	2
	4	In-Furrow - On Seeds	4
	5	In-Furrow - On Seeds	6

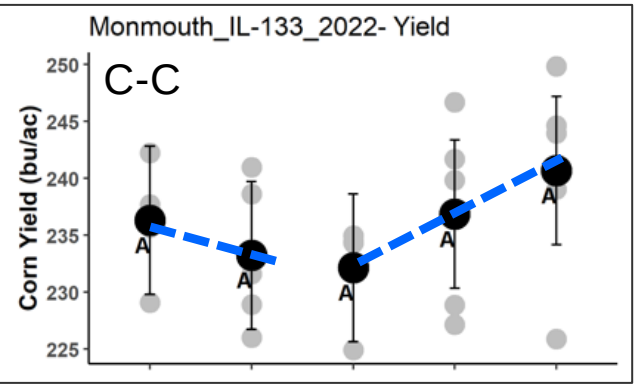
Variables to explain outcomes:

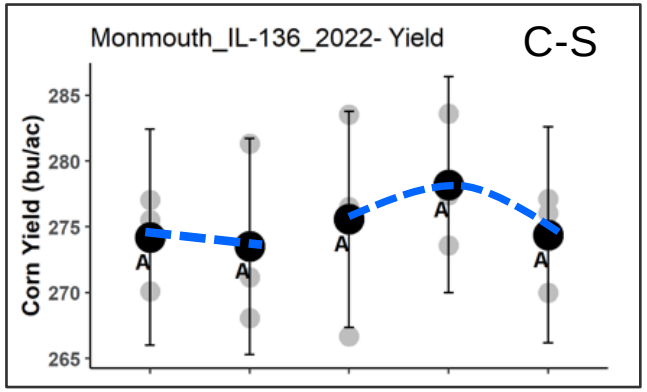


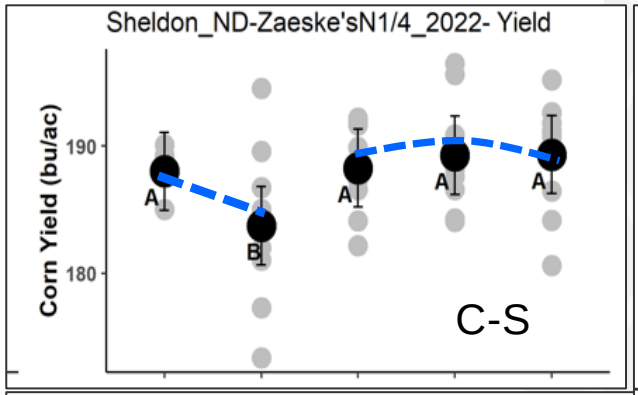


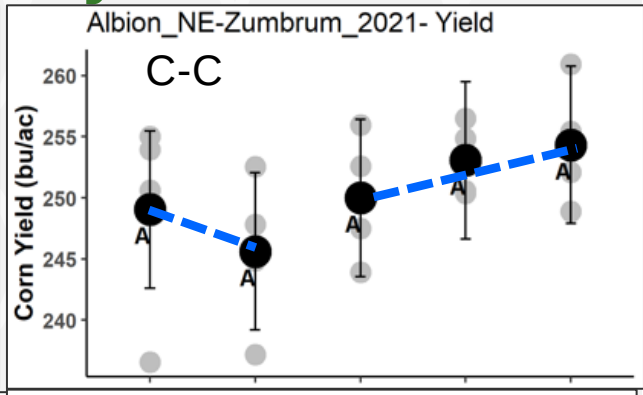

Albion_NE-Zumbrum_2021- Yield
Corn Yield (bu/ac)
260
255
250
245
240
A
A
A
A
A
Continuous-6
NoApplication
OnSeeds-2
OnSeeds-4
OnSeeds-6

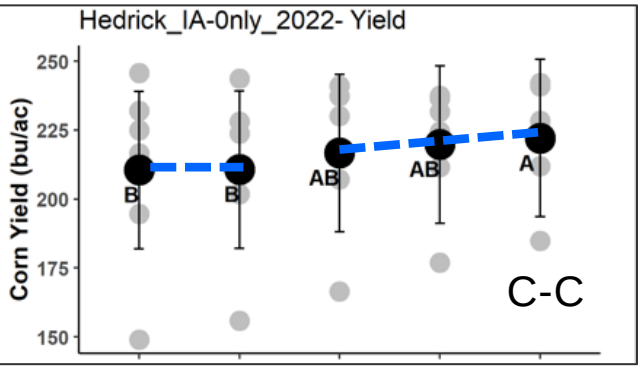
ExactShot OnSeed Fertilizer: 21 Site-Years Yield Summary

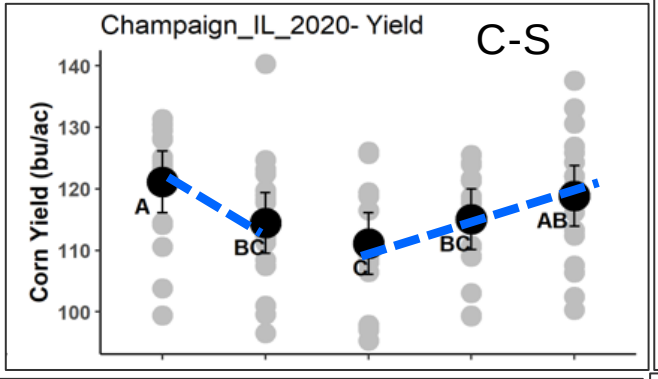


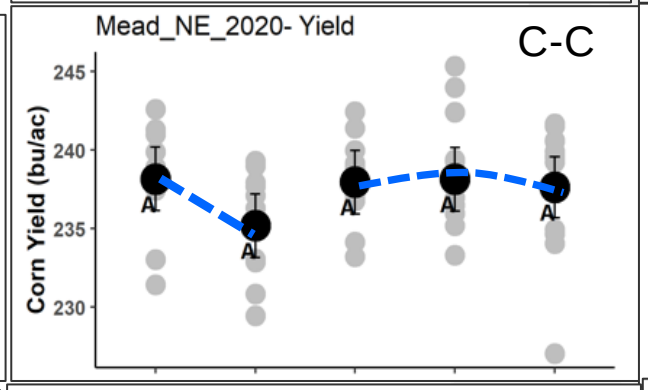


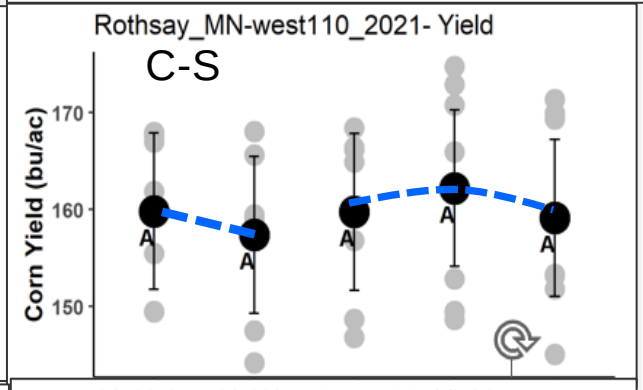


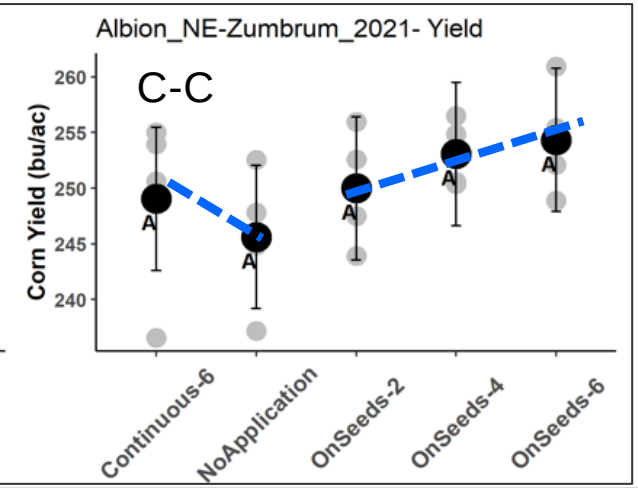


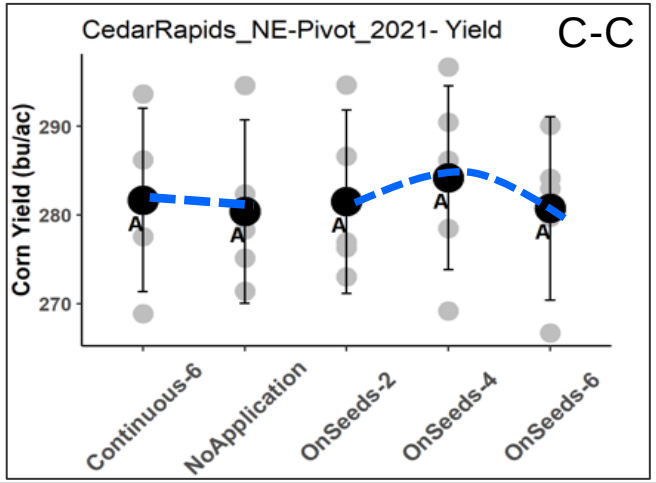


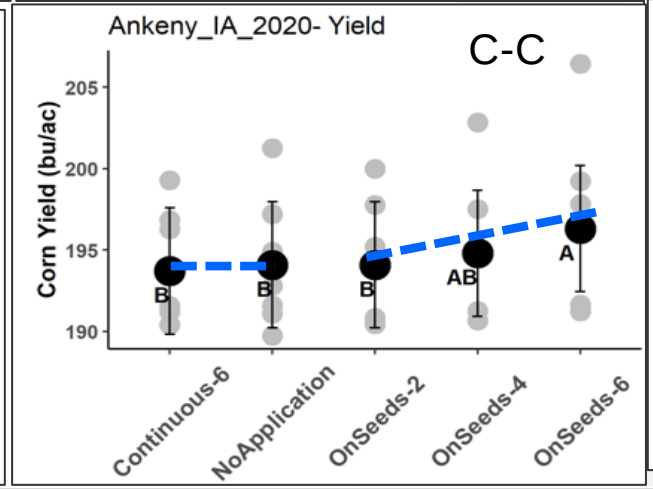


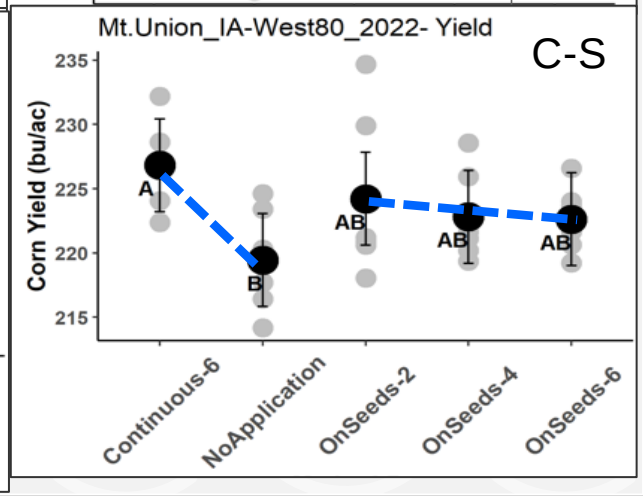




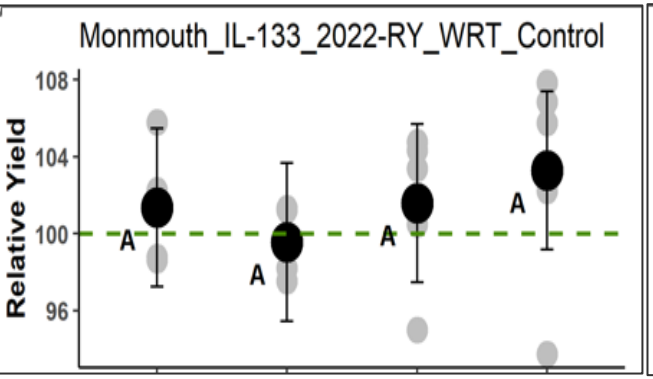


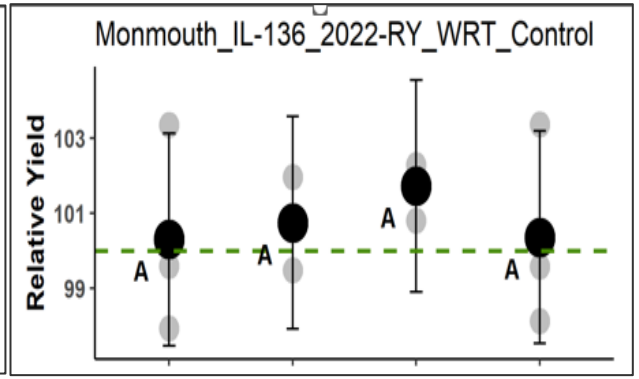


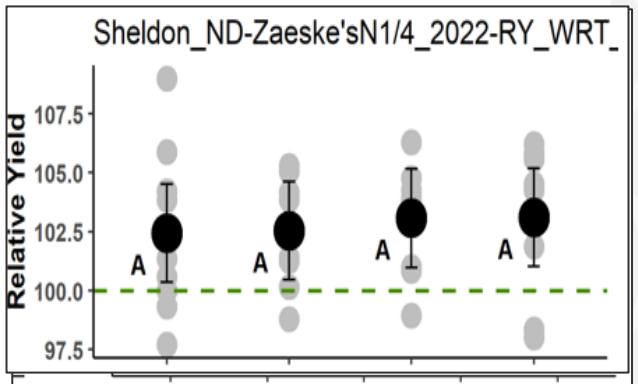


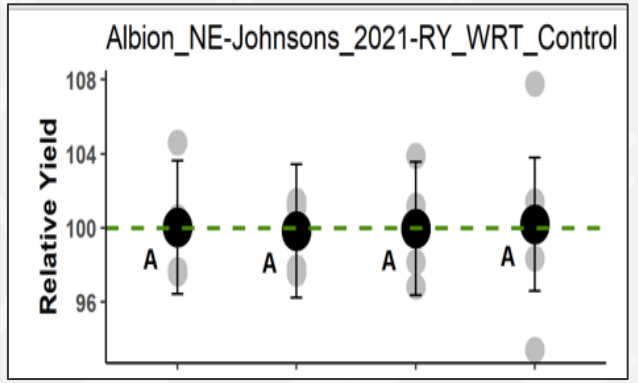


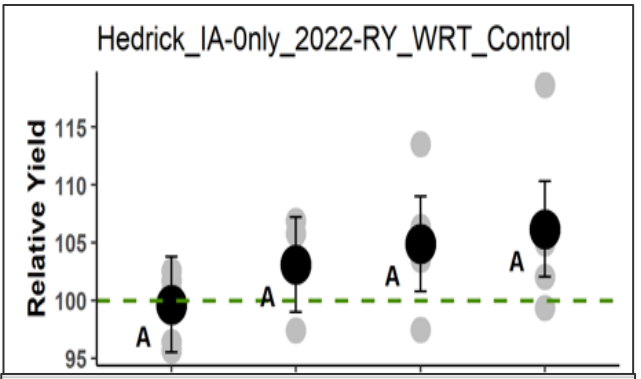
ExactShot OnSeed Fertilizer: 21 Site-Years Relative Yield vs Control

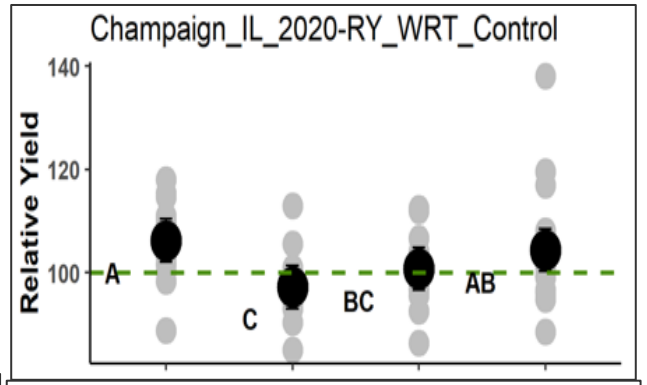


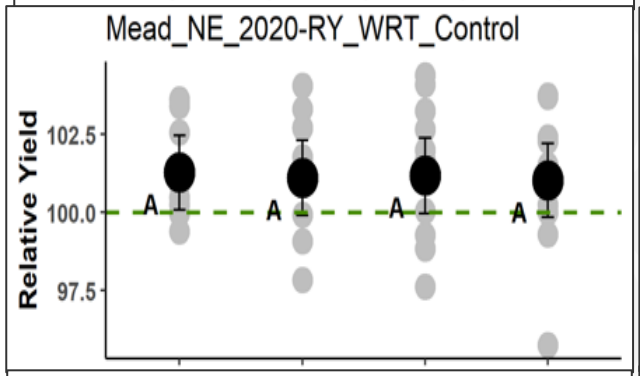


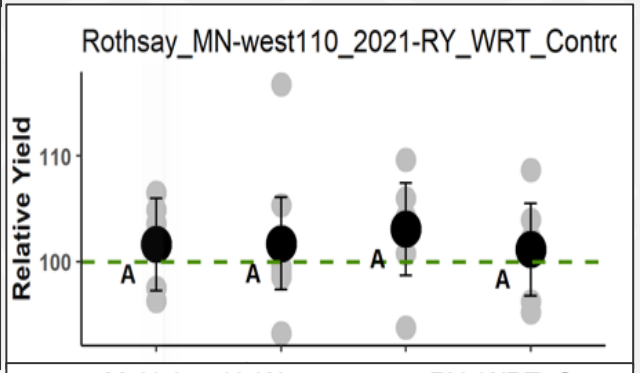


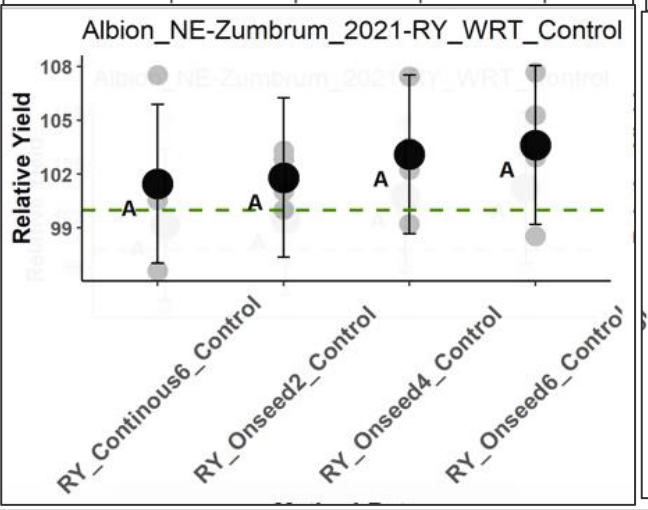


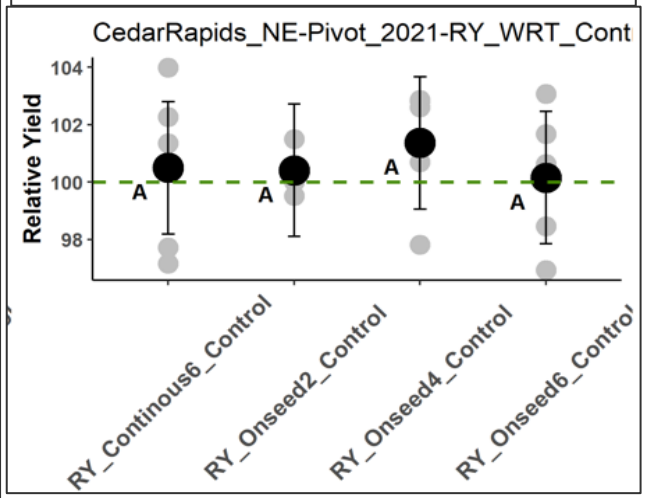


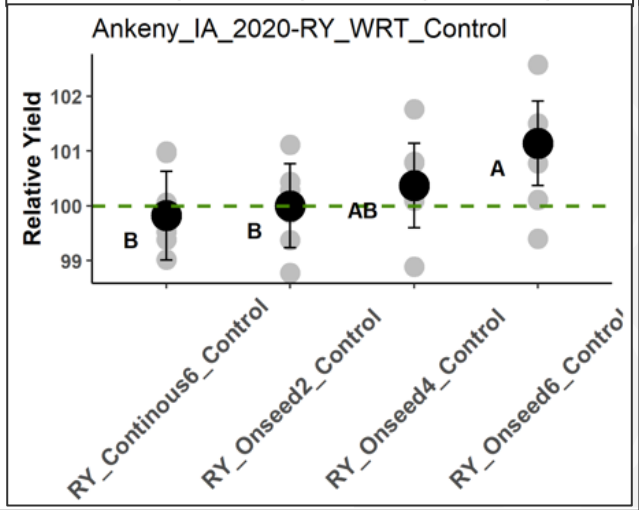


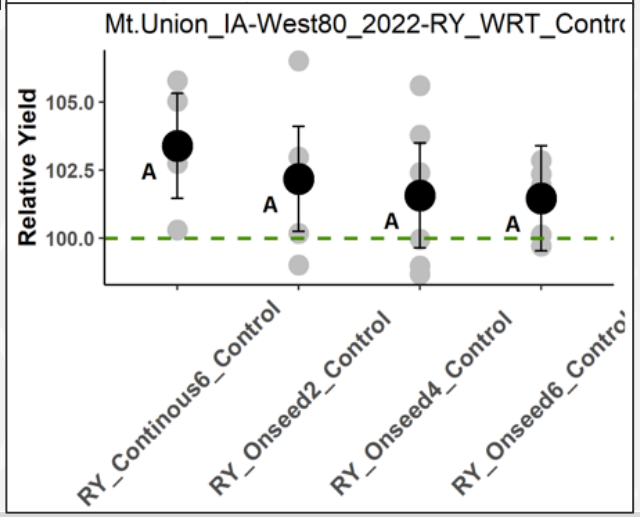










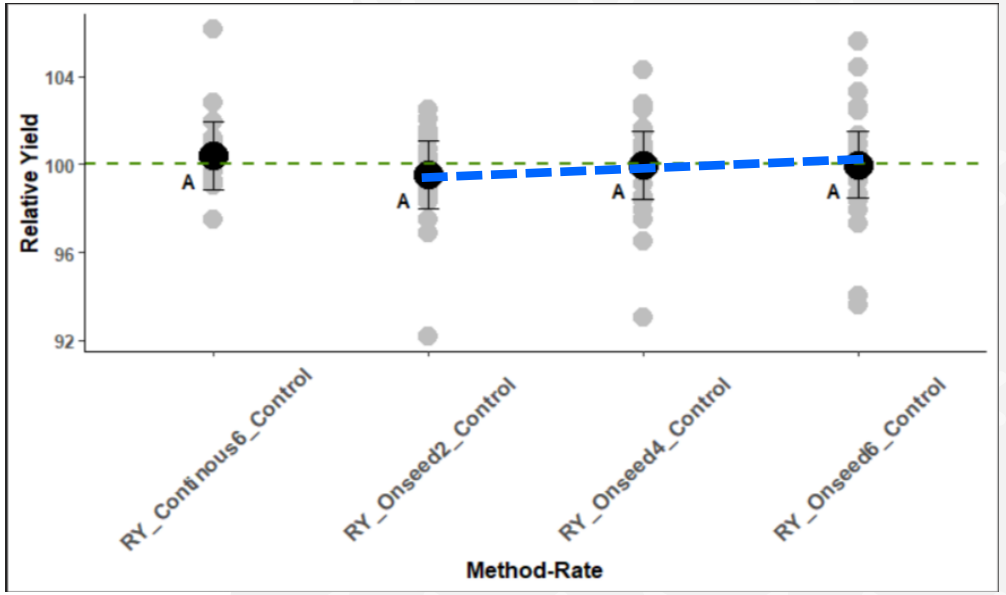


Relative Yield Aggregate Summaries

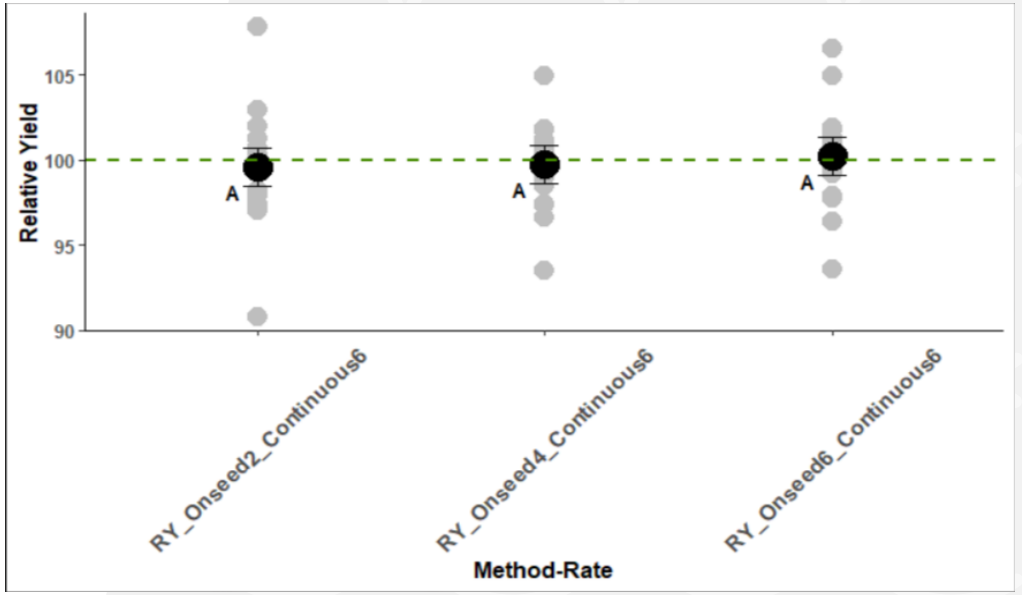
- **Relative Yield vs Control Treatment**
- All treatment comparisons were around 100%.
- A slight tendency to increase relative yield from OnSeed2 to OnSeed6.
- Two locations had significant yield increase from OnSeed treatments
- One location had a significant lower relative yield with OnSeed treatments

- **Relative Yield vs Continous6 Treatment**
- All treatment comparisons were not statistically different and were around 100%.

Relative Yield (%) vs Control



Relative Yield (%) vs Continous6



Probability of Relative Yield vs Control

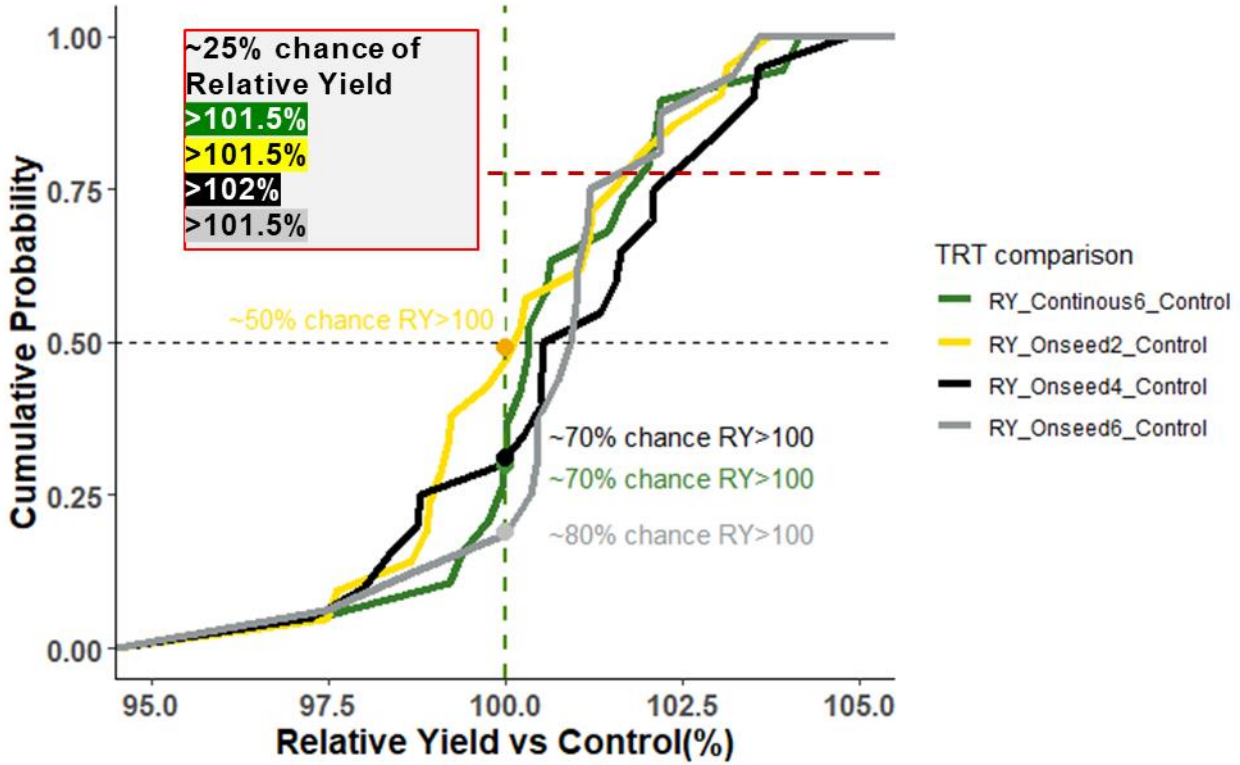
- ~50% of fields had Relative Yield > 100% for OnSeed2 vs Control
- ~70% of fields had Relative Yield > 100% for Continuous 6 and OnSeed4 vs control.
- ~80% of fields had Relative Yield > 100 % for OnSeed6 vs Control
- **~25% of fields had Relative Yield**

>101.5% for Continuous6 vs Control

>101.5% for OnSeed2 vs Control

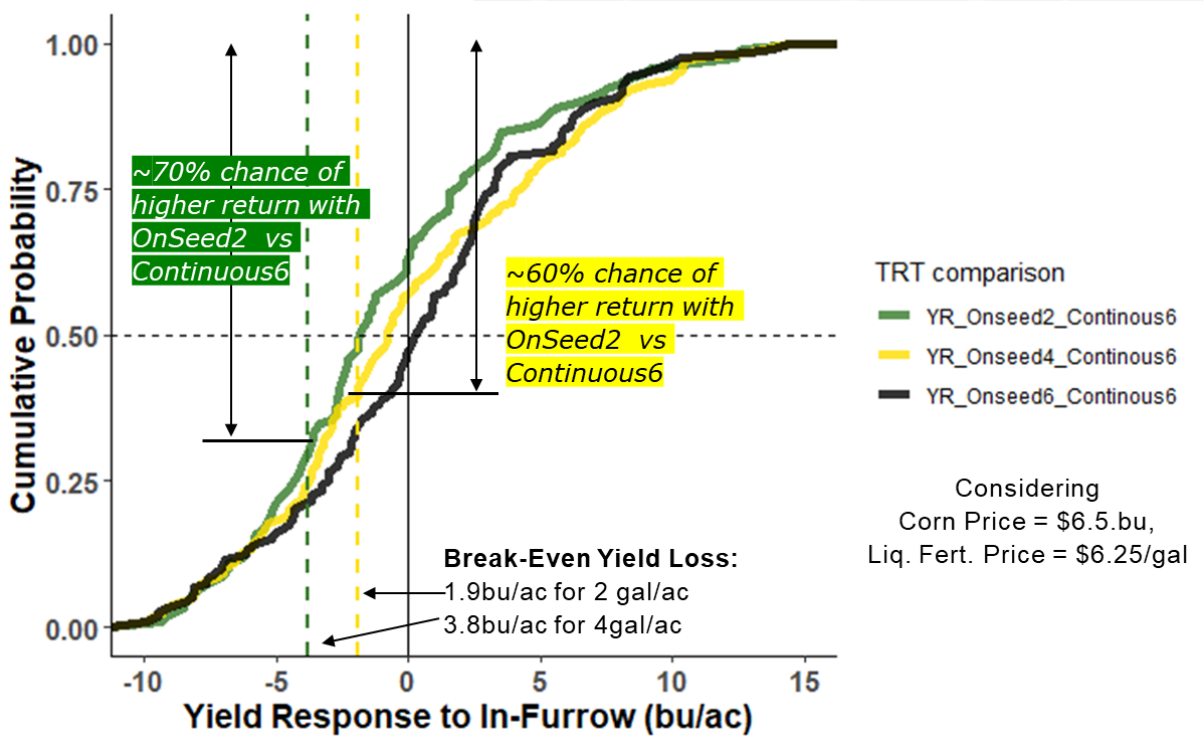
>101.5% for On-Seed6 vs Control

>102% for OnSeed4 vs Control



Economics of In-Furrow Fertilizer

- Considering corn price of $6.50/bu and liquid fertilizer cost of $6.25/gallon
- ~*70% chance of higher return with OnSeed2 vs Continuous6*
- *~ 60% chance of higher return with OnSeed4 vs Continuous6*
- The likelihood of cost saving increases with lower fertilizer price and higher corn price.
- * no fee for technology



Key Takeaways

- Agronomic research is driving innovation in the solutions Deere delivery into the marketplace
- Field trials building a database to quantify probability of response/ROI
- Next step is predict outcomes with some level of probability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