Does Size Matter? Agronomic Management of New Short-Stature Corn Hybrids

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So Why Short-Stature Hybrids?

- Lodging Resistance
- Higher Population Tolerance
- Higher Narrow Row Tolerance
- Easier In-Season Access
  - Nitrogen
  - Fungicide

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How do these hybrids compare?

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How do these hybrids compare?

Hybrid Type	Plant Height	Ear Height	Stover Dry Matter
	---- in ----	---- in ----	---- lbs/ac ----
Short	**67.7 b**	**22.5 b**	**7350 a**
Tall	**86.2 a**	**37.5 a**	**7220 a**

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What questions do we have?

- How do short-stature hybrids yield in comparison to full-stature hybrids?
- Do optimum seeding and nitrogen rates differ with short-stature hybrids in comparison to full-stature hybrids?
- How do short-stature hybrids perform in narrow (20-in) rows?
- How do short-stature hybrids respond to foliar fungicide?

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Short-stature and Full-stature Corn Hybrid Response to Nitrogen Rate and Plant Population

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Full-Stature vs. Short-Stature (All Treatments)

Hybrid (Type)	Grain Yield	Plant Stand
	---- bu/ac ----	---- plants/ac ----
RT6203TVX2 (Short)	288.3 d*	35982 bc
RV6205TVX4 (Short)	280.1 c	35585 c
DKC61-41RIB (Tall)	301.6 b	36246 b
DKC62-70RIB (Tall)	308.3 a	37387 a

* Average corn grain yield and stand values that contain the same corresponding letter and are within the same column are not statistically different from each other ($P > 0.1$).

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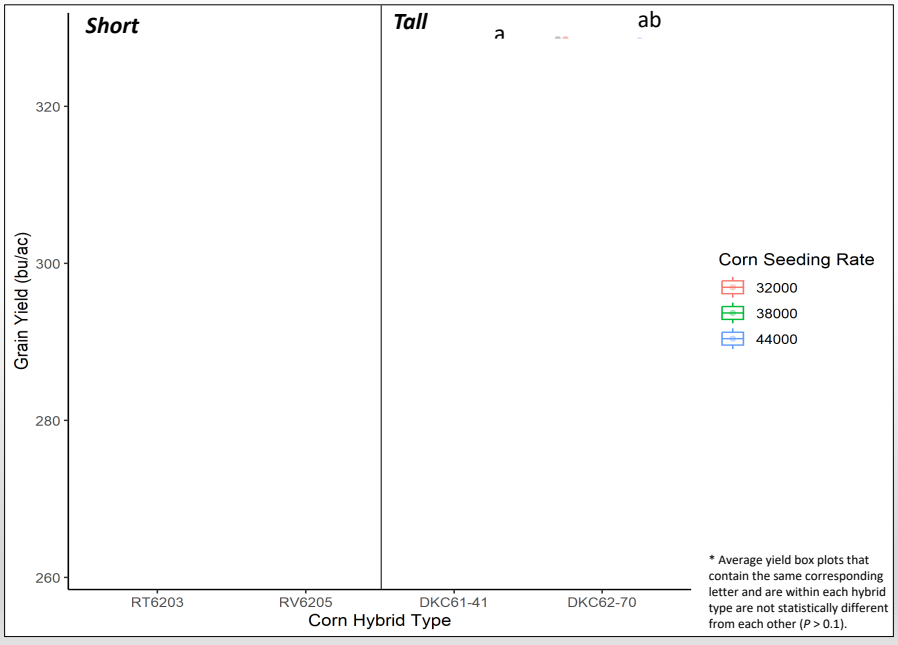
Interaction between hybrid type and seed rate



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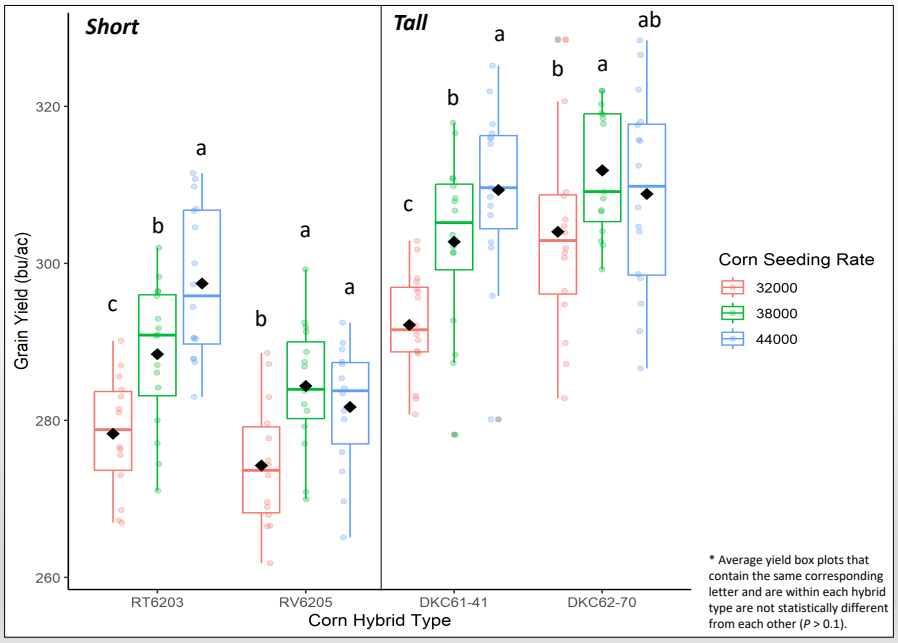

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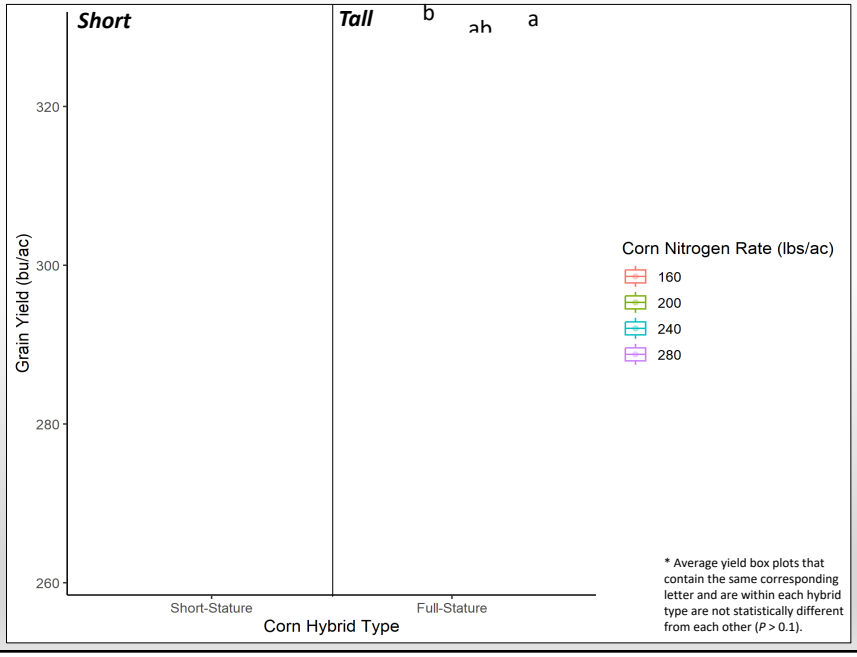
Interaction between hybrid and N rate



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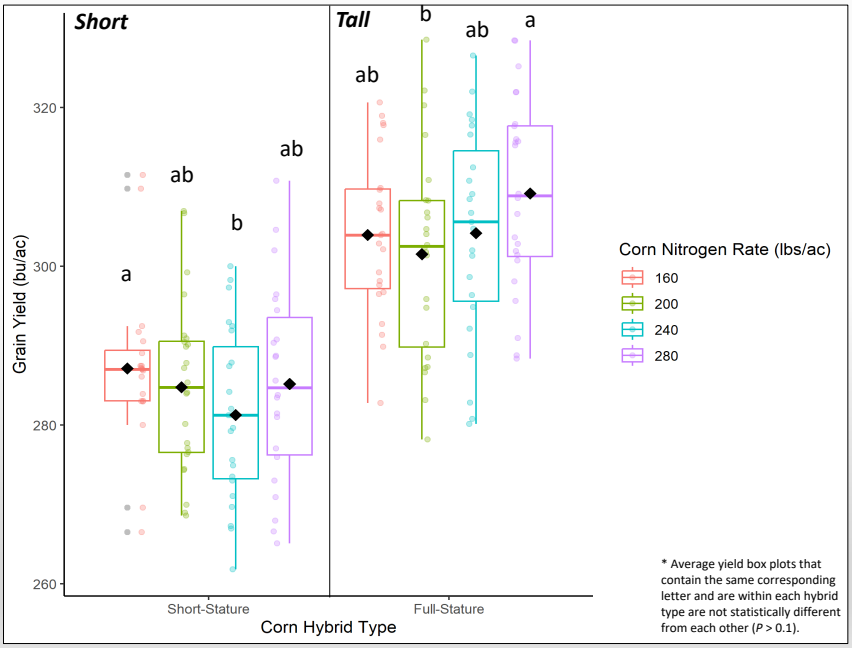
Interaction between hybrid and N rate



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Preliminary Conclusions (Hybrid x Nitrogen x Seed Rate)

- Across all examined treatments (populations and N rates), full-stature hybrids yielded higher than short-stature hybrids by ***10 - 20 bushels/ac***
  - Poorer final stands, lower ear heights = harvest challenges
  - ***Can we manage our way to comparable yields?***
- Preliminary research results observed interactions between hybrid type and optimum seeding rate, but not nitrogen rate
  - Hybrid specific seeding rates may be needed
  - On-average, short-stature corn requires higher optimum seeding rate as compared to full-stature hybrids
- Research trials will be repeated in 2024

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Short-stature Corn Response to Row Spacing and Plant Population

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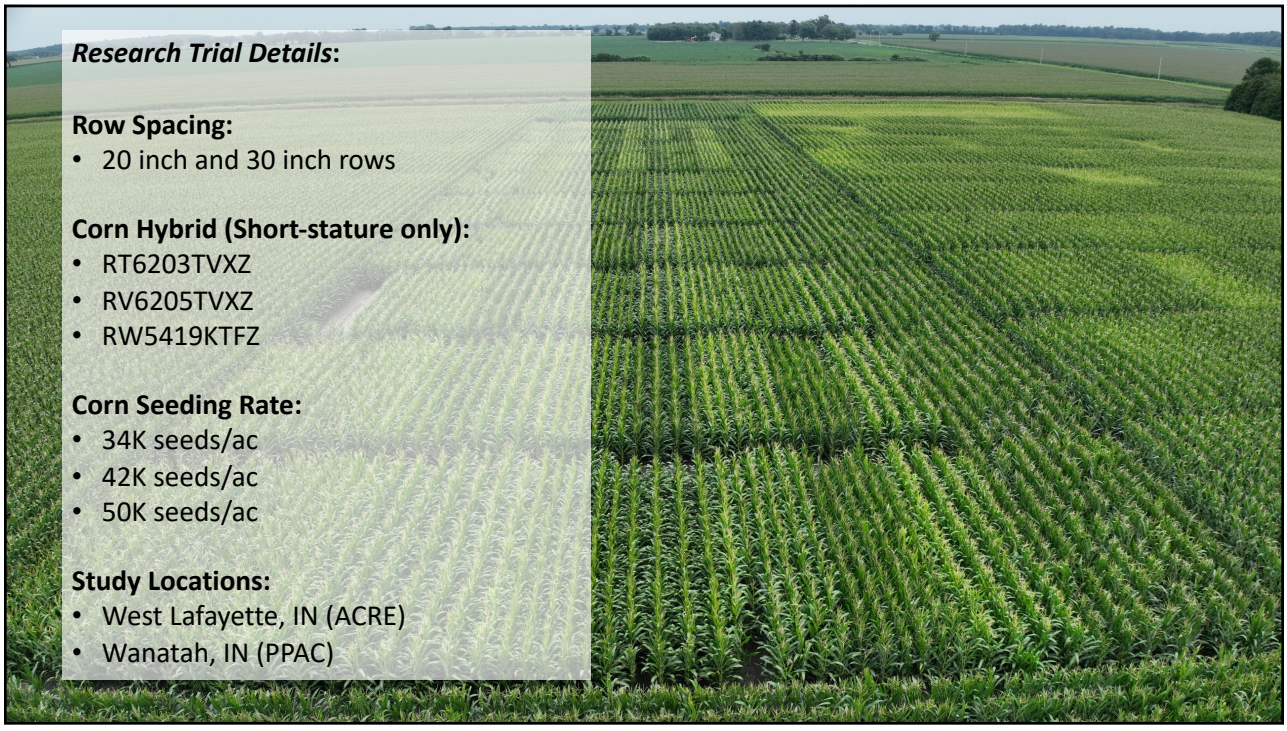

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20 inch rows at V10

30 inch rows at V10

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Short-Stature Corn Yield Response to Row Spacing

Location	Row Spacing	Yield
	---- in ----	---- bu/ac ----
West Lafayette, IN	20	273.2 a*
	30	276.5 a
Wanatah, IN	20	258.6 a
	30	249.0 a

* Average corn grain yield values that contain the same corresponding letter and are within the same location are not statistically different from each other ($P > 0.1$).

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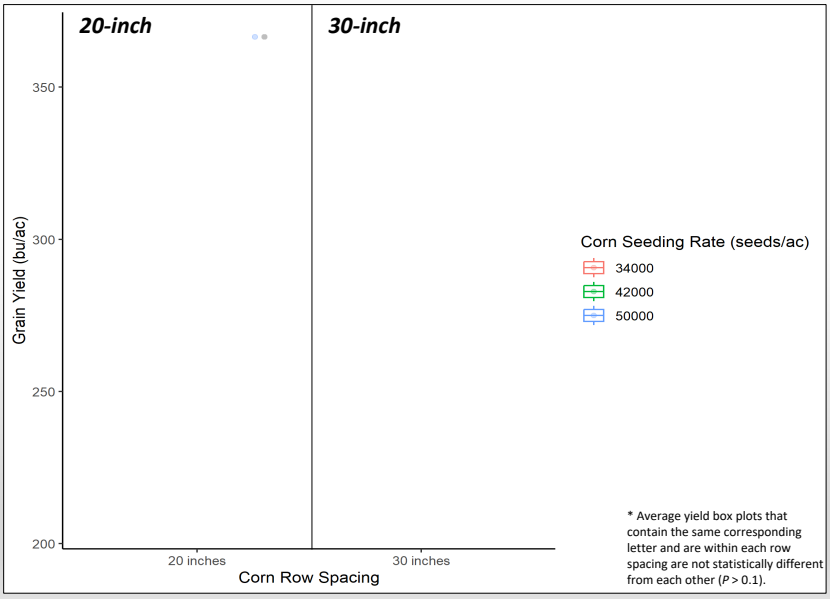
Interaction between corn seeding rate and row spacing (West Lafayette, IN)



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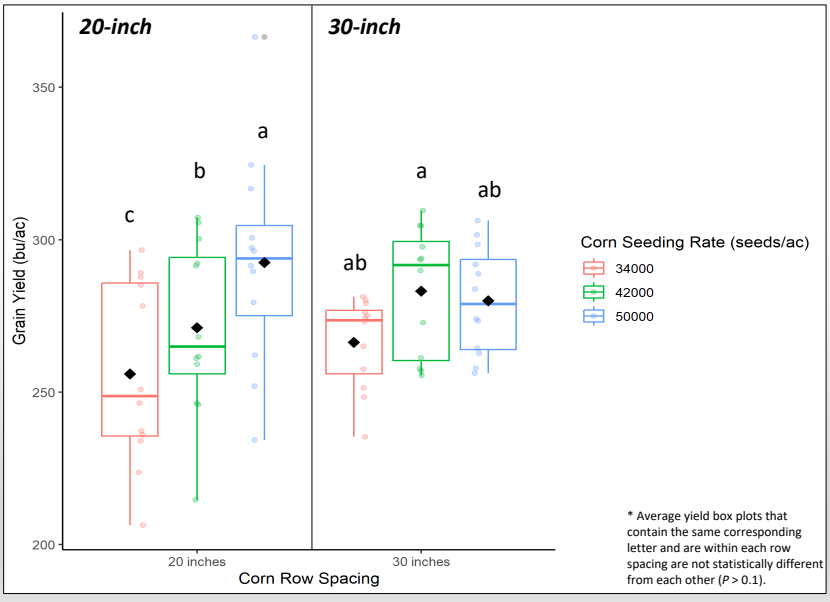

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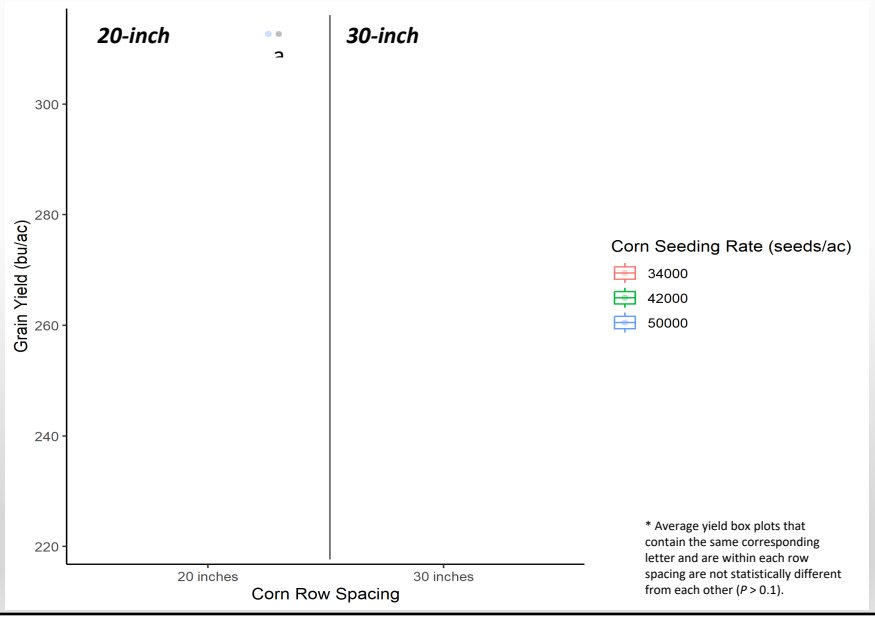
Interaction between corn seeding rate and row spacing (Wanatah, IN)



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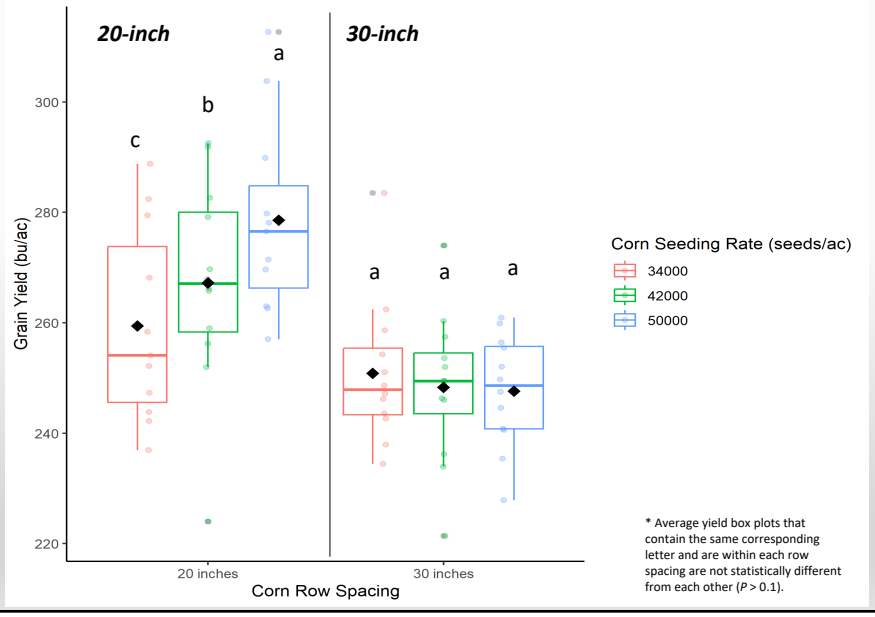

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Short-stature corn yield, ear height, and plant height response to hybrid type. West Lafayette, IN 2023

Hybrid	Yield	Ear Height (measured from shank attachment)	Plant Height (R3 growth stage)
	-- bu/ac --	-- inches --	-- inches --
RT6203TVXZ	294.1 a*	22.4 a	67.3 a
RV6205TVXZ	280.7 b	21.1 b	65.1 b
RW5419KTFZ	249.8 c	18.7 c	65.0 b

* Average corn grain yield and height values that contain the same corresponding letter and are within the same column are not statistically different from each other ($P > 0.1$).

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Short-stature corn yield, ear height, and plant height response to hybrid type. Wanatah, IN 2023

Hybrid	Yield	Ear Height (measured from shank attachment)	Plant Height (R3 growth stage)
	-- bu/ac --	-- inches --	-- inches --
RT6203TVXZ	243.7 b*	29.4 ab	66.7 c
RV6205TVXZ	251.5 b	31.4 a	80.1 a
RW5419KTFZ	266.1 a	27.3 b	72.5 b

* Average corn grain yield and height values that contain the same corresponding letter and are within the same column are not statistically different from each other ($P > 0.1$).

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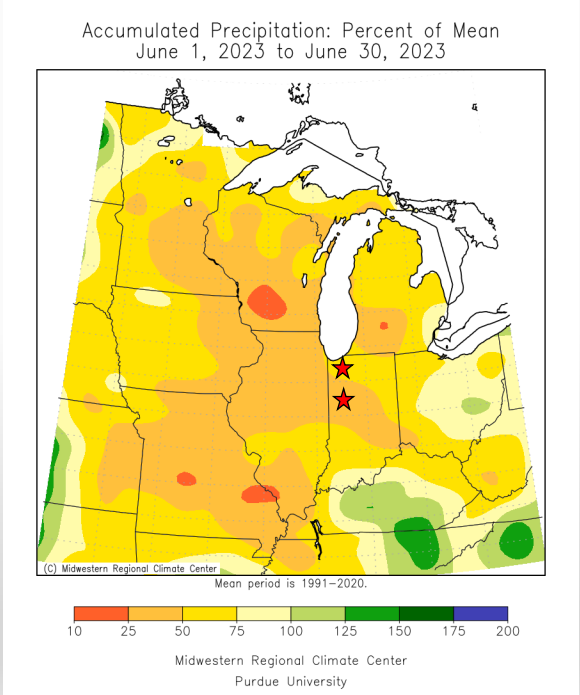
2023 Rainfall

- June Precip Totals
  - West Lafayette, IN – **0.96”**
  - Wanatah, IN – **3.39”**



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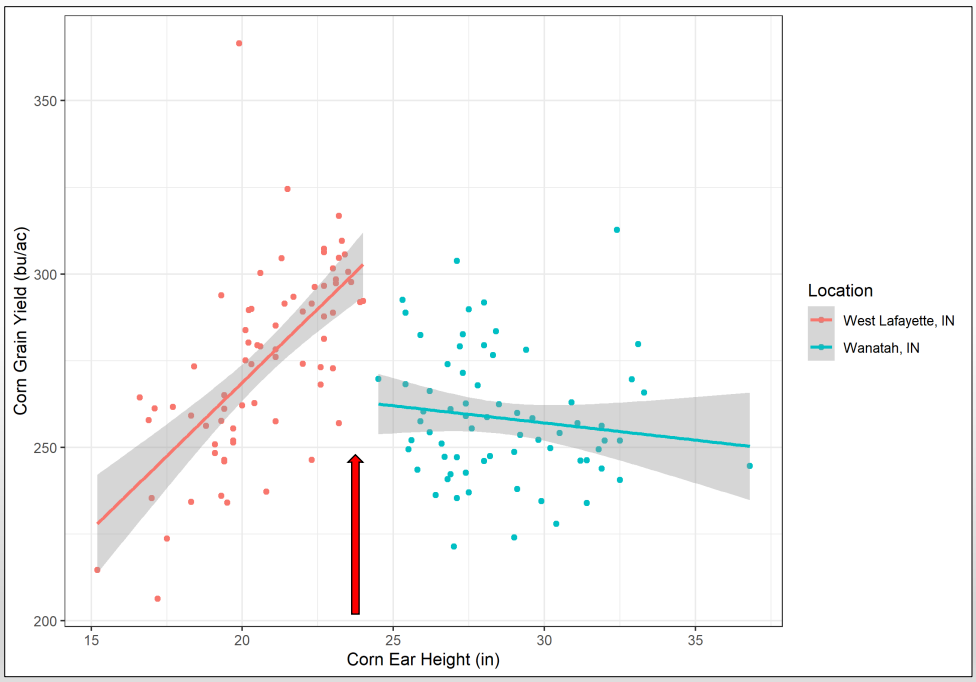

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Preliminary Conclusions (Hybrid x Row Spacing x Seed Rate)

- Short-stature hybrids have higher optimum seeding rates and yield potential in 20 inch rows
- Ear Height is KEY
  - Hybrid selection
  - Environment
  - Management Practice Influence

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Short-stature Corn Response to Fungicide Timing

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Easier Access

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Short-stature corn response to fungicide timing (3 hybrids)

Fungicide Timing	Yield	Tar Spot Severity (R5)	Gray Leaf Spot Severity (R5)
	---- bu/ac ----	---- % ----	---- % ----
None	257.8 b*	12.1 a	8.1 a
R1	266.7 ab	1.2 b	3.9 b
R1 + R3	273.7 a	0.1 b	1.9 b

* Average corn grain yield and disease severity values that contain the same corresponding letter and are within the same column are not statistically different from each other ($P > 0.1$).

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2023 Preliminary Conclusions

- Full-stature hybrids out-yielded short-stature hybrids in 2023
  - One location, not always the case with other research trials
  - The potential for managing to comparable yields is there
- Corn optimum seeding rate differs with hybrid type and row spacing
- Ear height is KEY for short-stature hybrids
  - Hybrid selection
  - Environment
  - Management practice

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Questions?

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