It’s Not The Size Of The Corn But How It Yields

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Background: What do we know?

- Bayer
  - ~30% shorter
  - plant height <7’
  - ear height >24”
  - shortened internodes below the ear
  - # of nodes and leaves are the same
  - current short stature trait is non-transgenic

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Why Short-Stature Hybrids?

- Lodging resistance
- Easier in-season access
- Higher population tolerance
- Higher narrow row tolerance

Photo credit: Dan Quinn, Purdue University

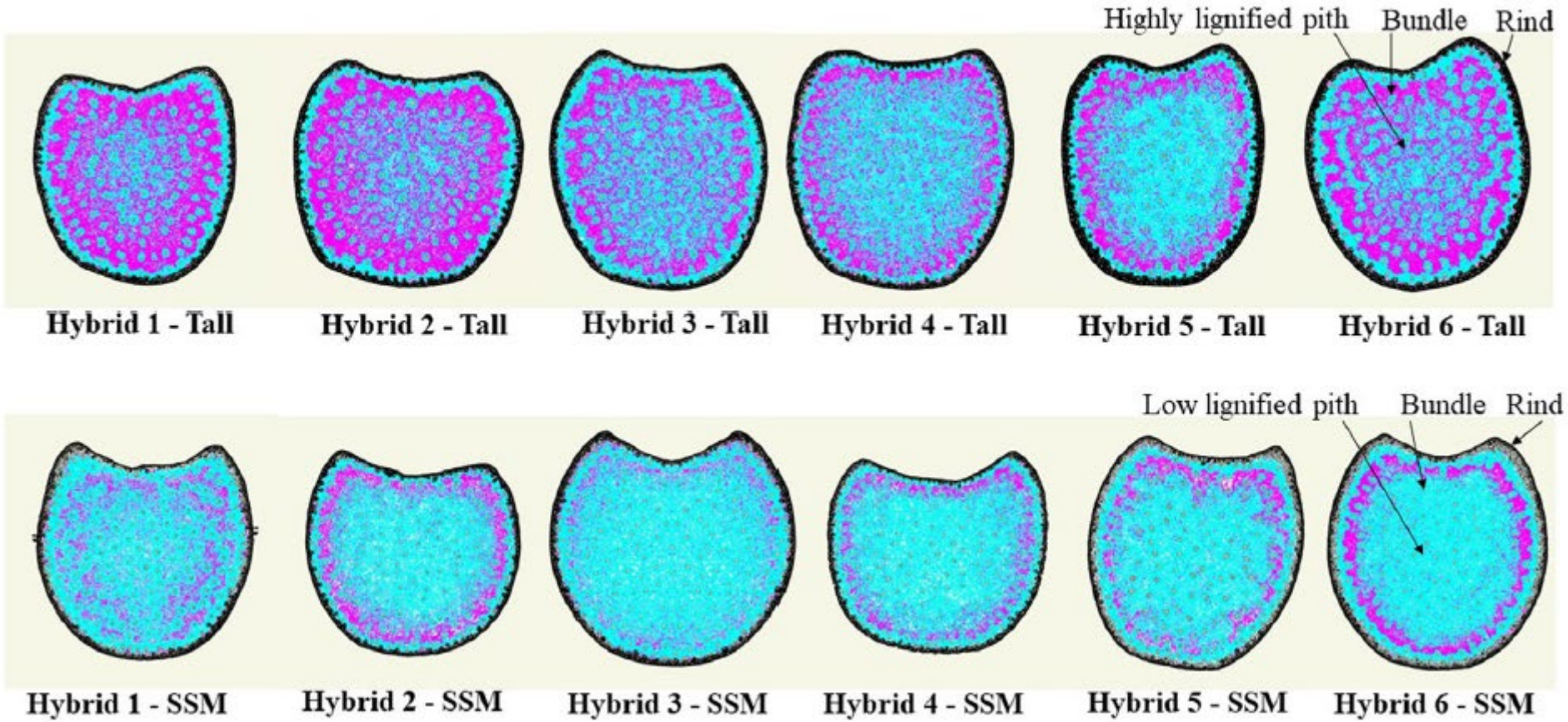
How do these hybrids compare?

Photo credit: Dan Quinn, Purdue University

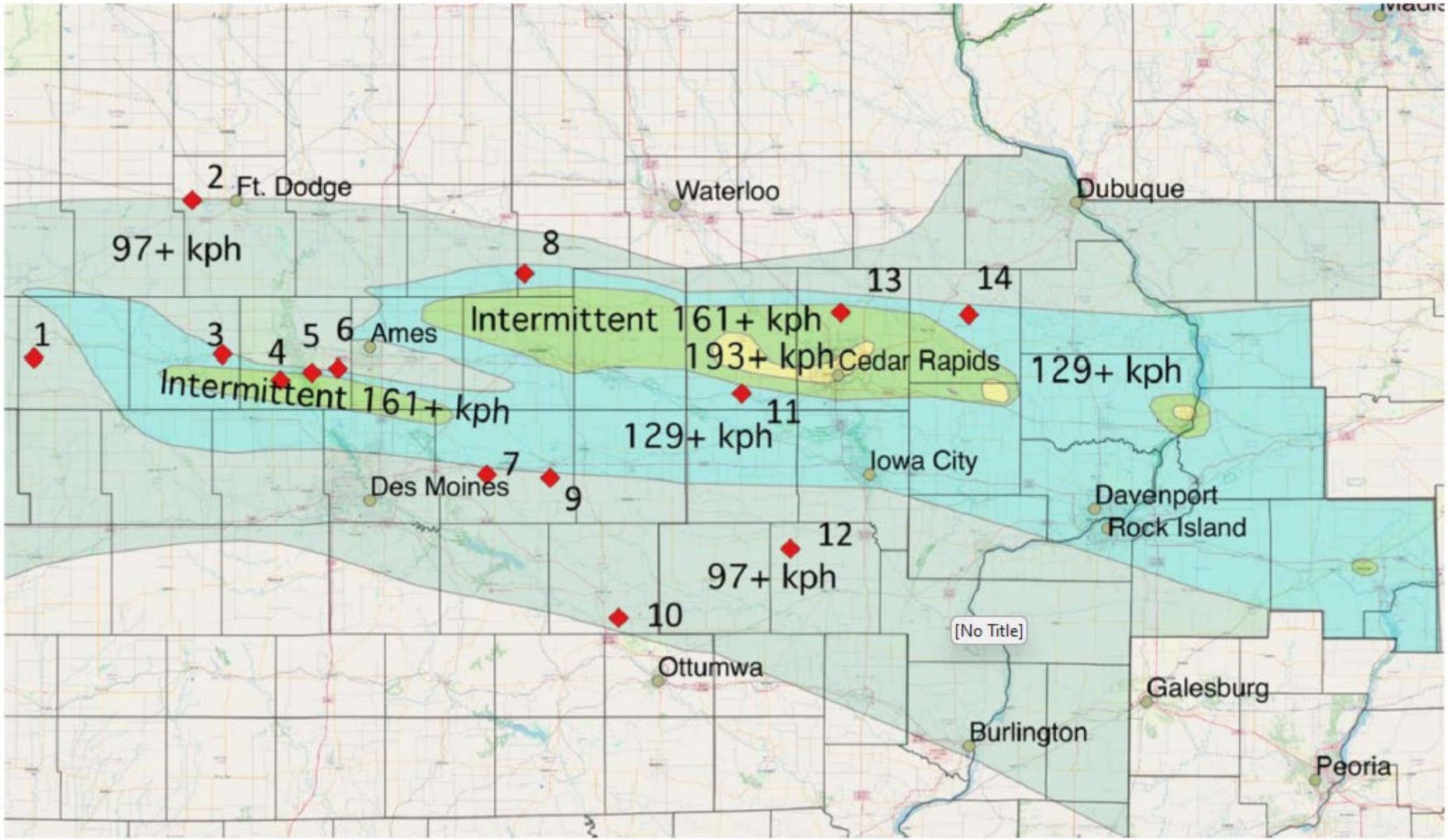
20 inch rows at V10

30 inch rows at V10

Photo credit: Dan Quinn, Purdue University



Bourdoncle et al, 2023

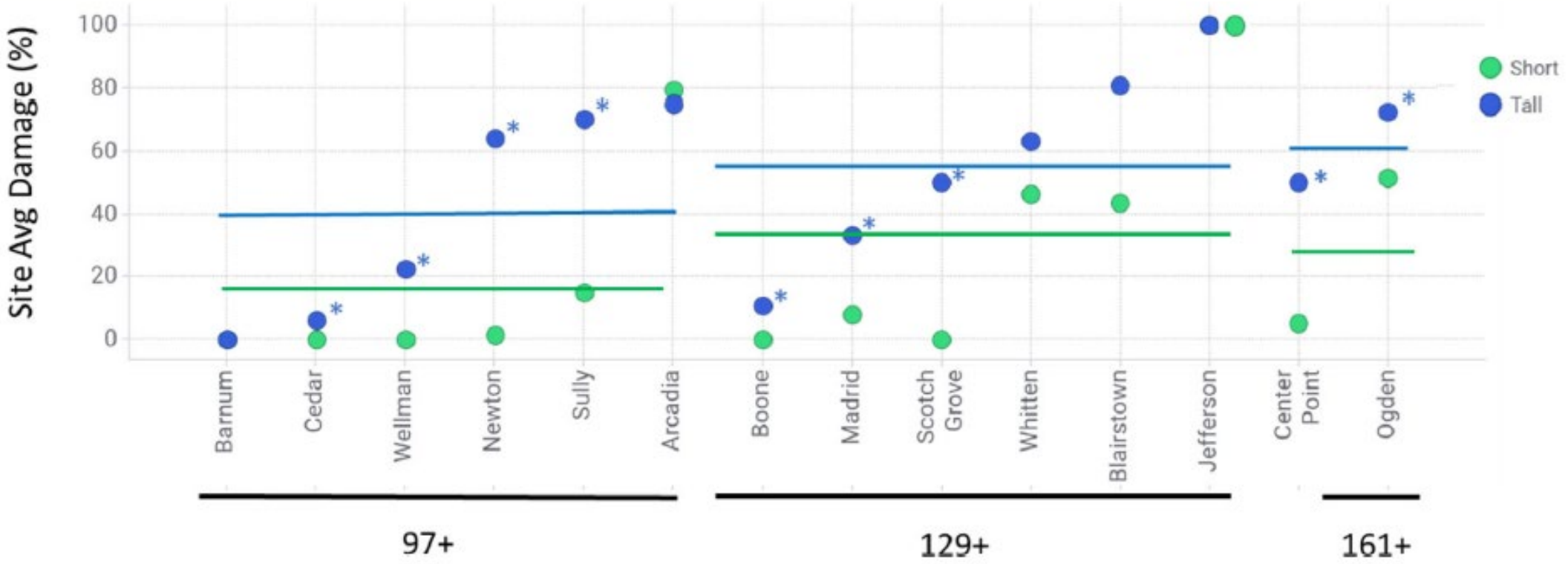


Barten et al, 2023

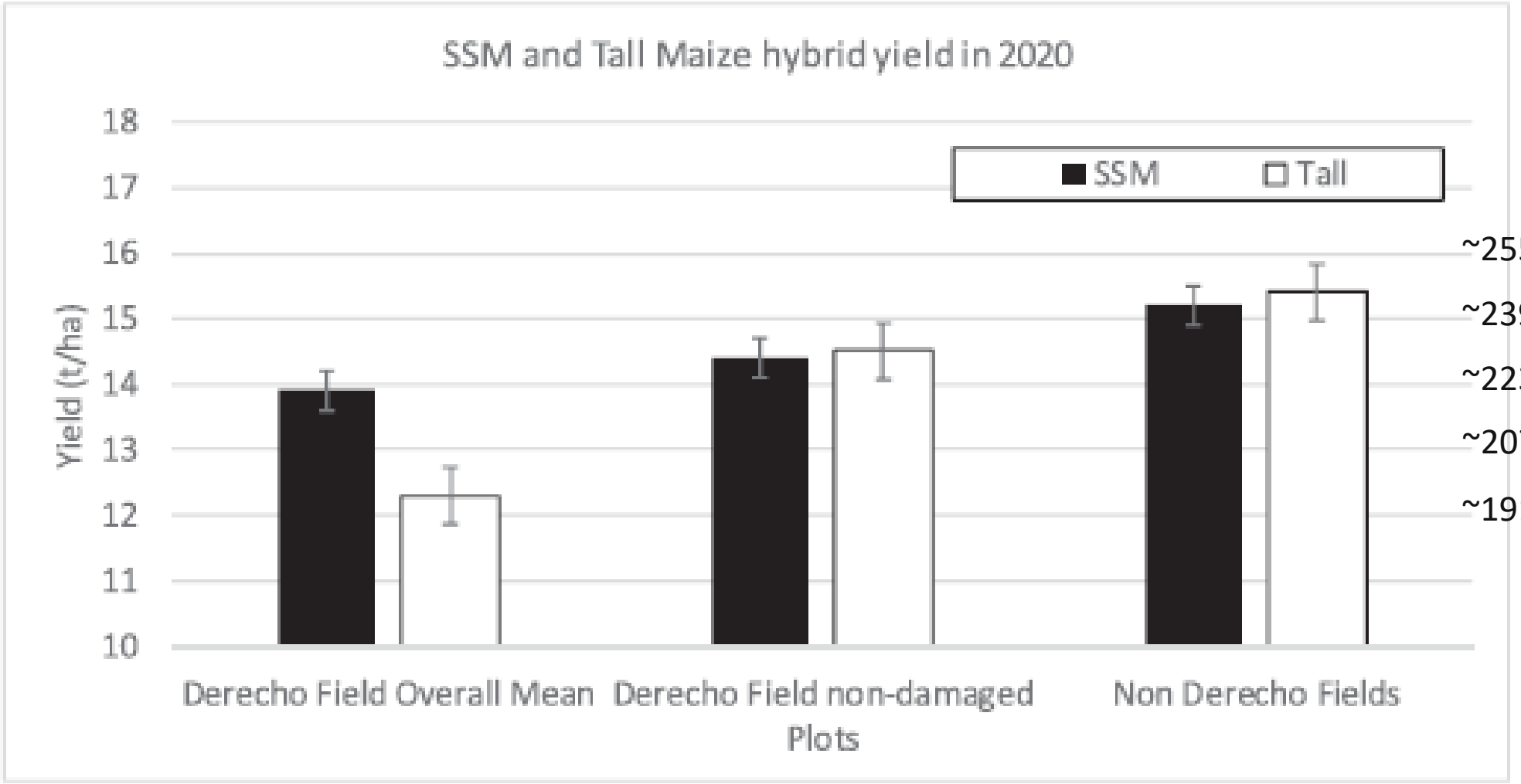
Short Stature

Tall Stature

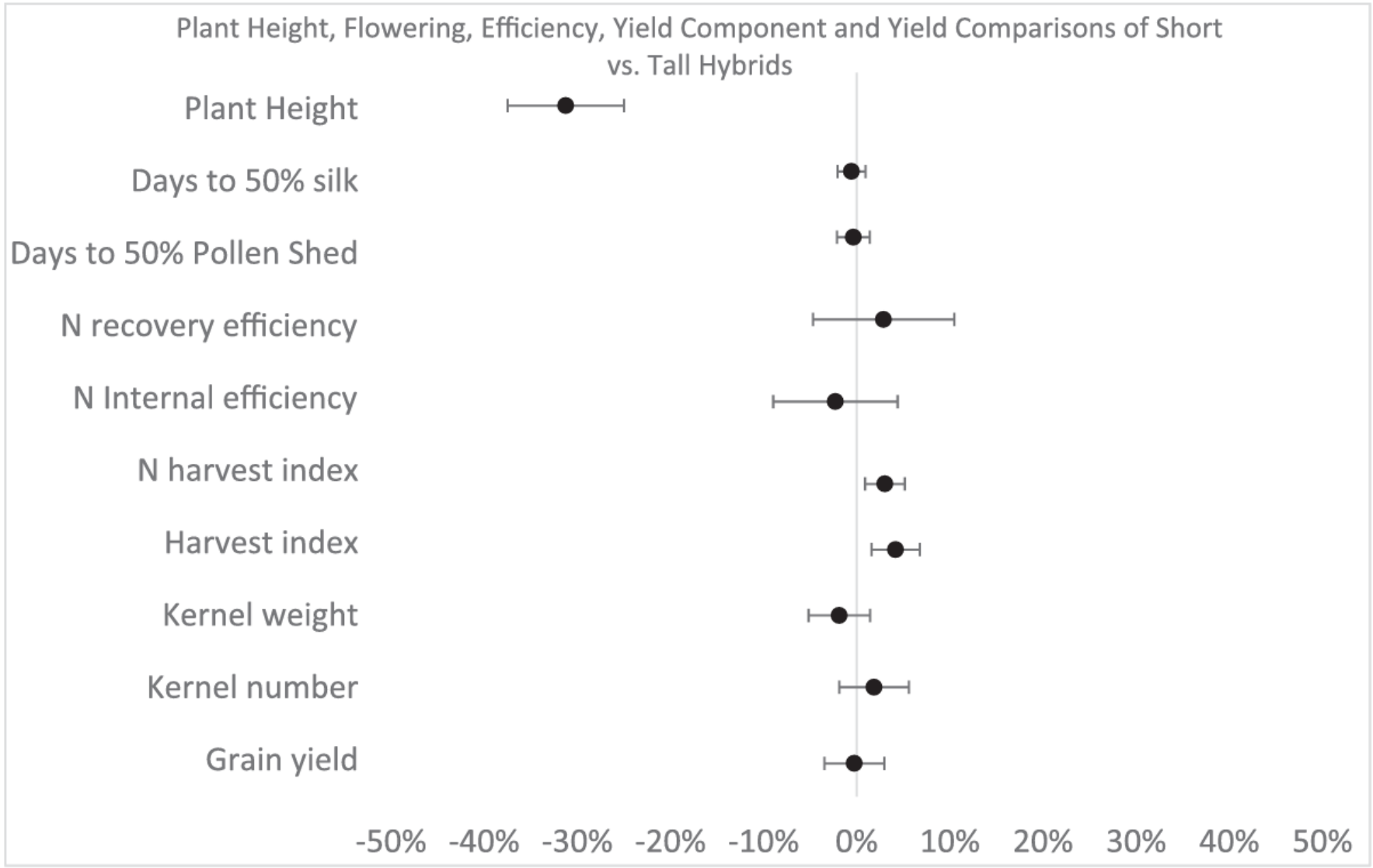
Barten et al, 2023



Barten et al, 2023



Barten et al, 2023

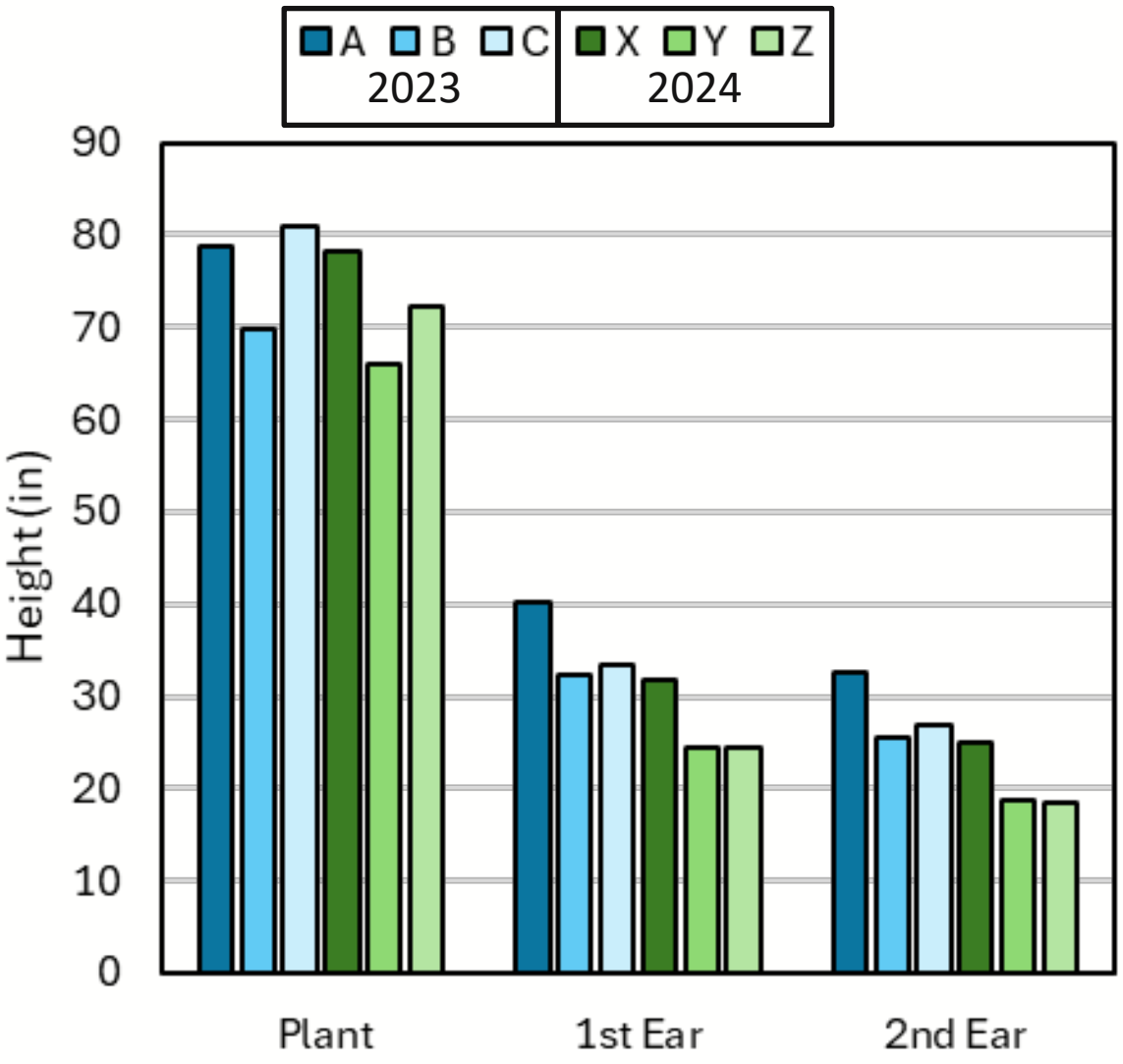


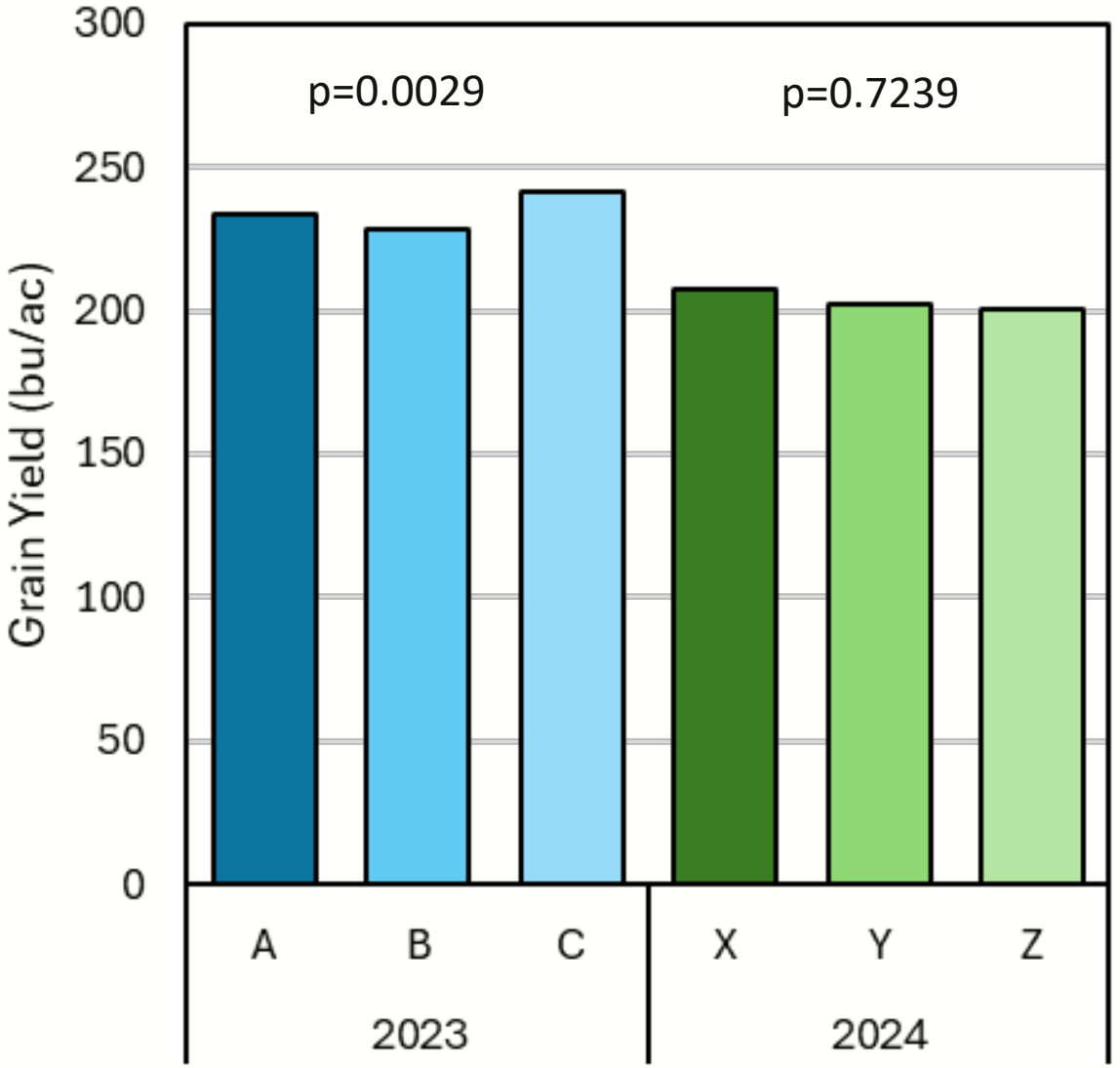
Kosola et al, 2023

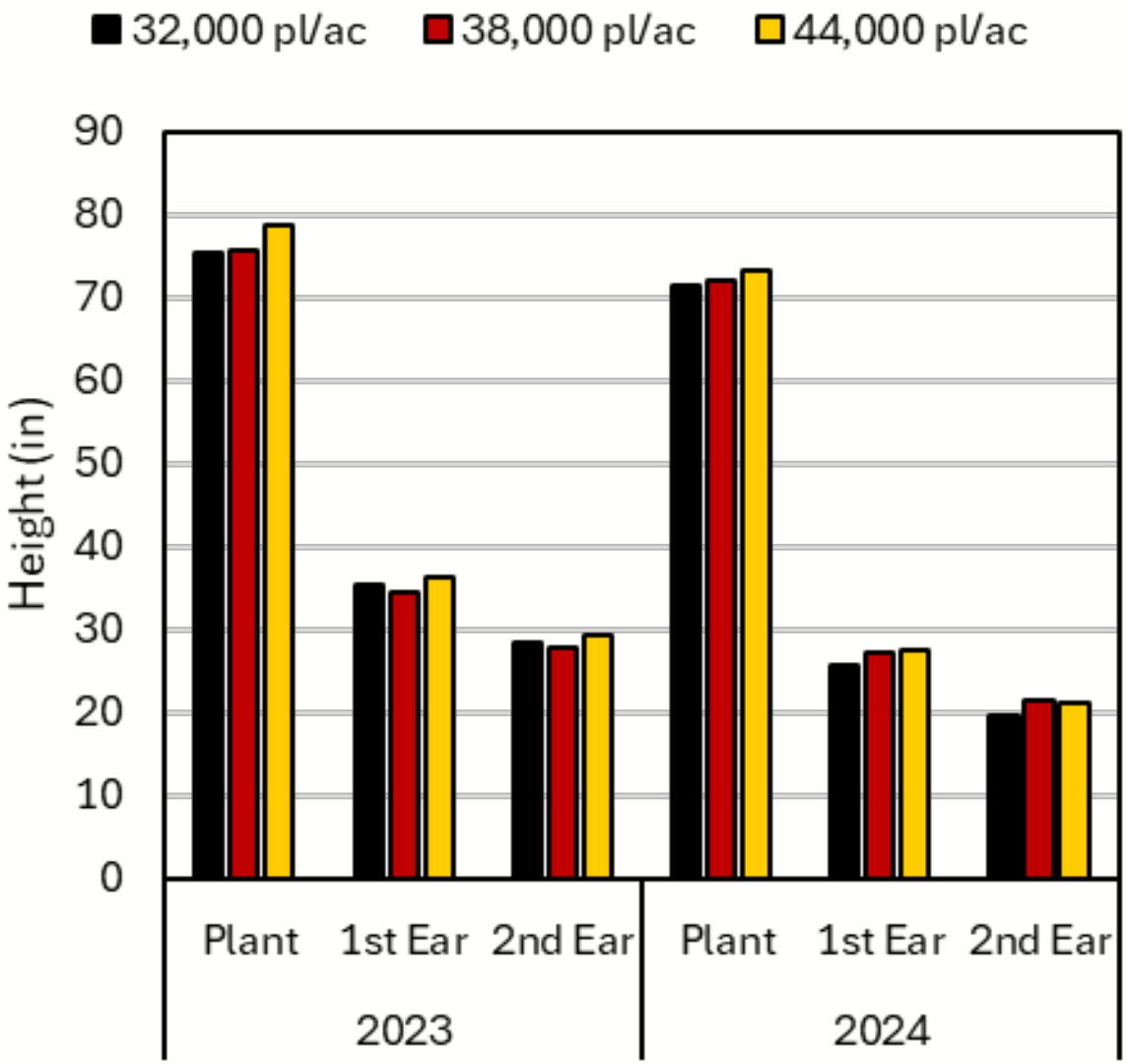
Hybrid x Plant Density

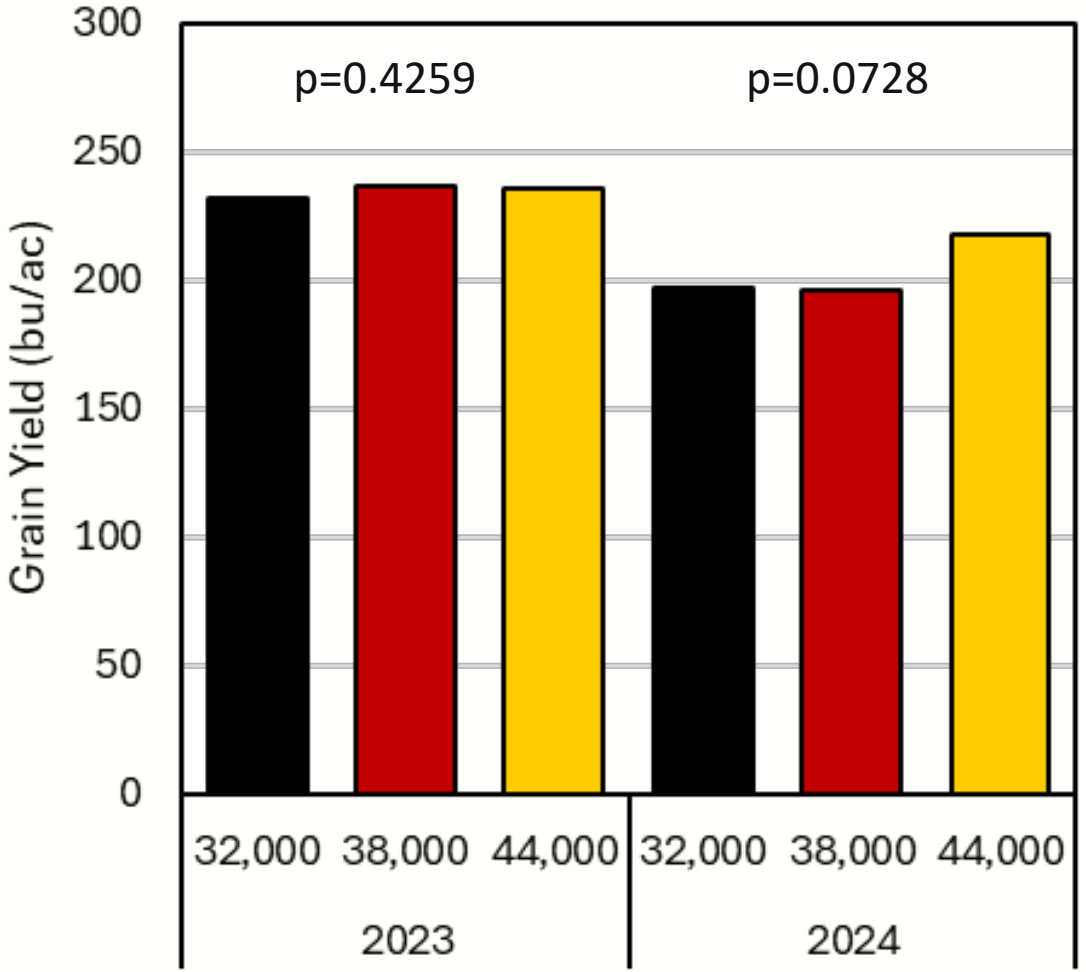
Trial – 2023 and 2024 at Ames, IA

- 3 short-stature corn hybrids
- 3 planting densities
  - 32,000 sds/acre
  - 38,000 sds/acre
  - 44,000 sds/acre
- 4 replications

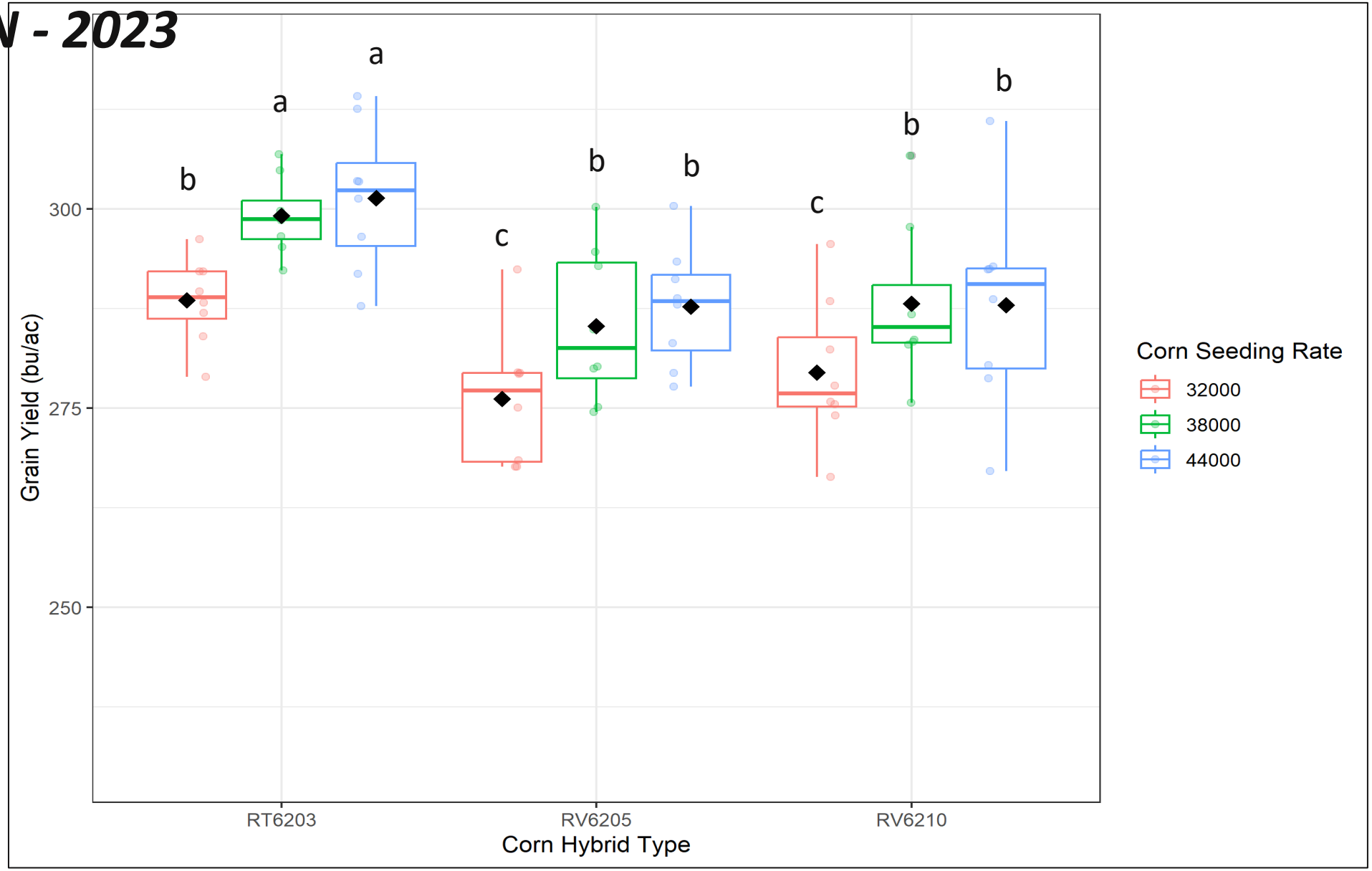

A B C X Y Z
2023
2024
Height (in)
0
10
20
30
40
50
60
70
80
90
Plant
1st Ear
2nd Ear


p=0.0029
p=0.7239
Grain Yield (bu/ac)
0
50
100
150
200
250
300
A
B
C
X
Y
Z
2023
2024

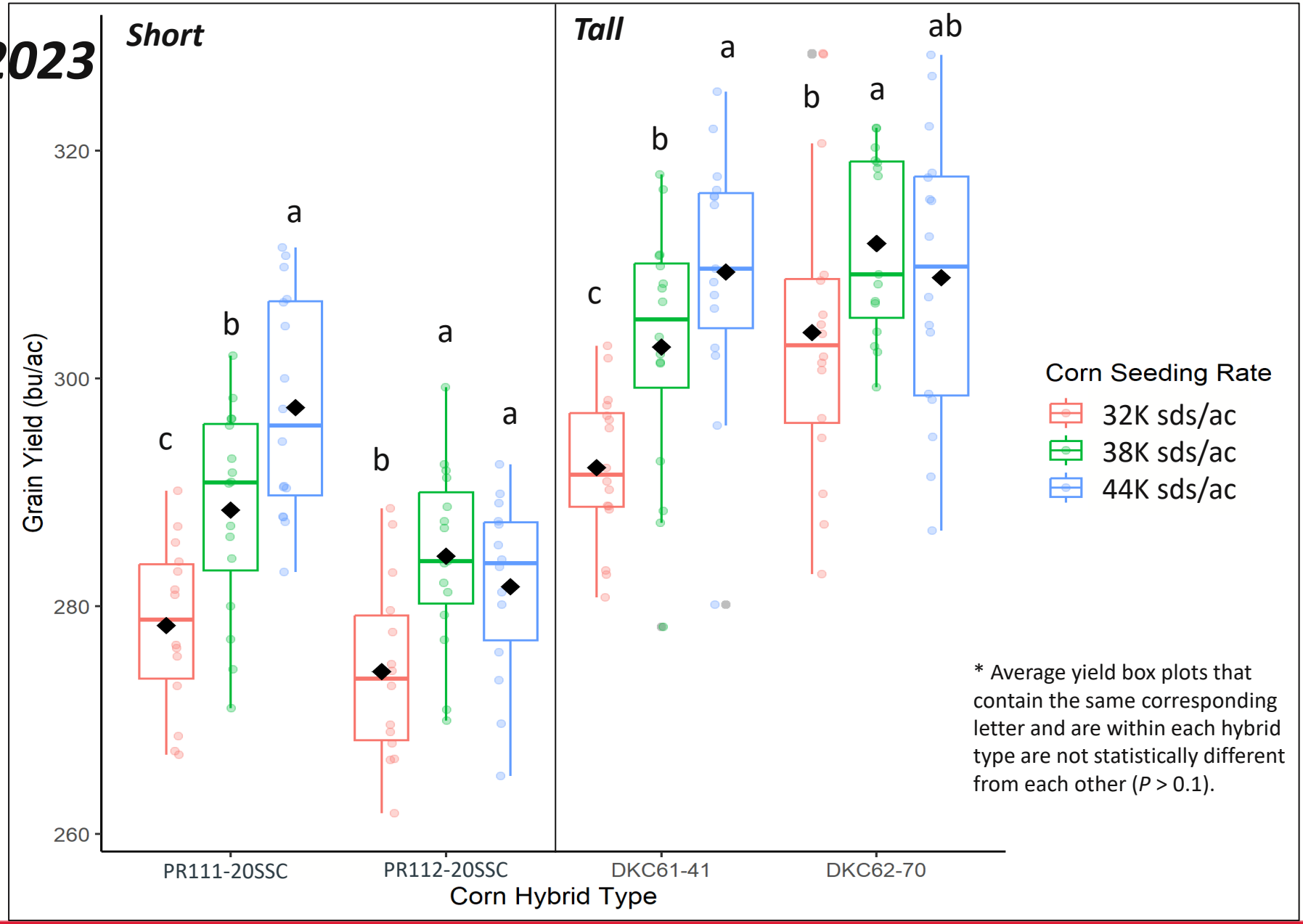

32,000 pl/ac
38,000 pl/ac
44,000 pl/ac
Height (in)
90
80
70
60
50
40
30
20
10
0
Plant
1st Ear
2nd Ear
Plant
1st Ear
2nd Ear
2023
2024


Grain Yield (bu/ac)
300
250
200
150
100
50
0
p=0.4259
p=0.0728
32,000
38,000
44,000
32,000
38,000
44,000
2023
2024

West Lafayette, IN - 2023



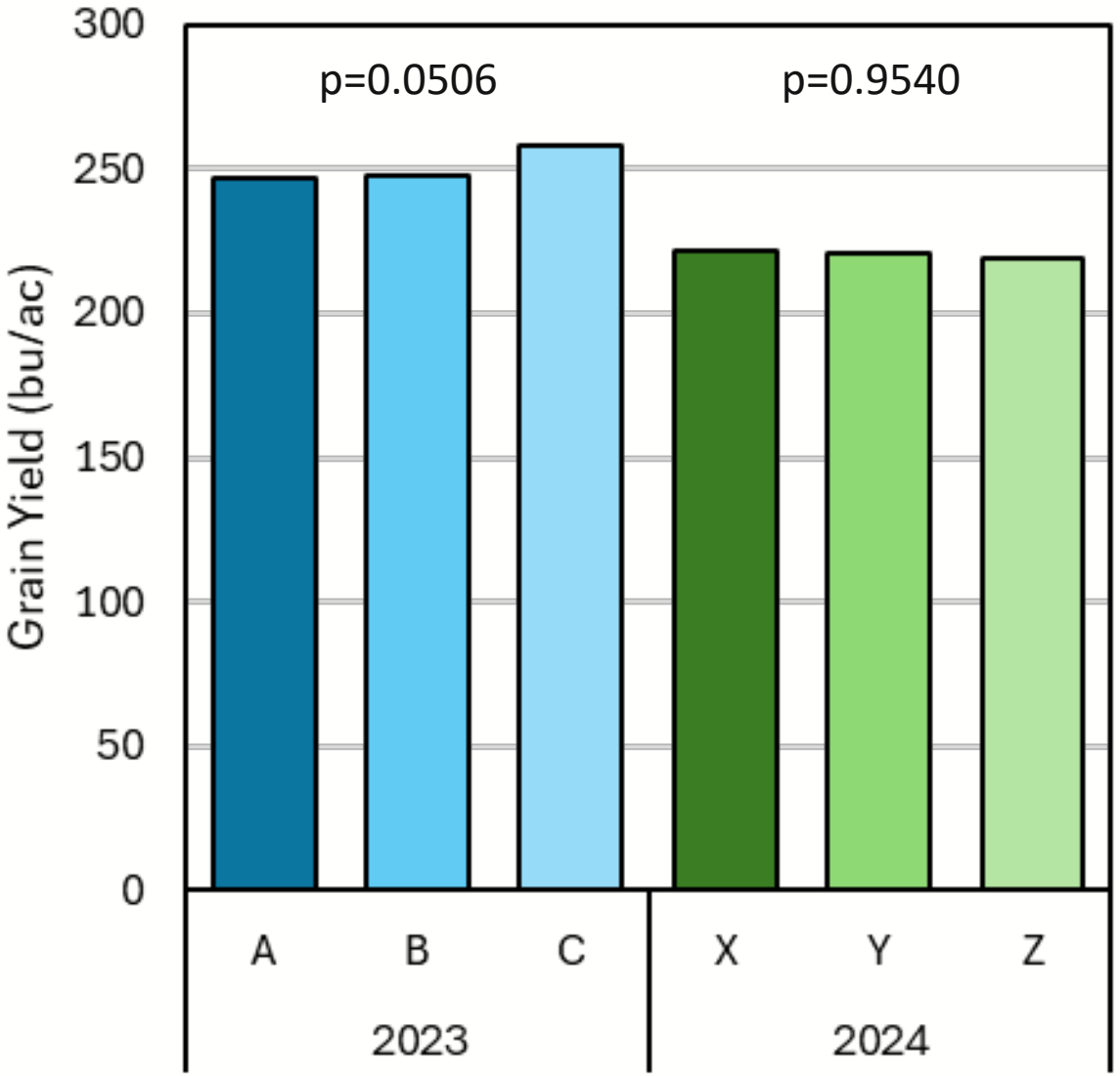
West Lafayette, IN - 2023 Interaction between hybrid type and seed rate

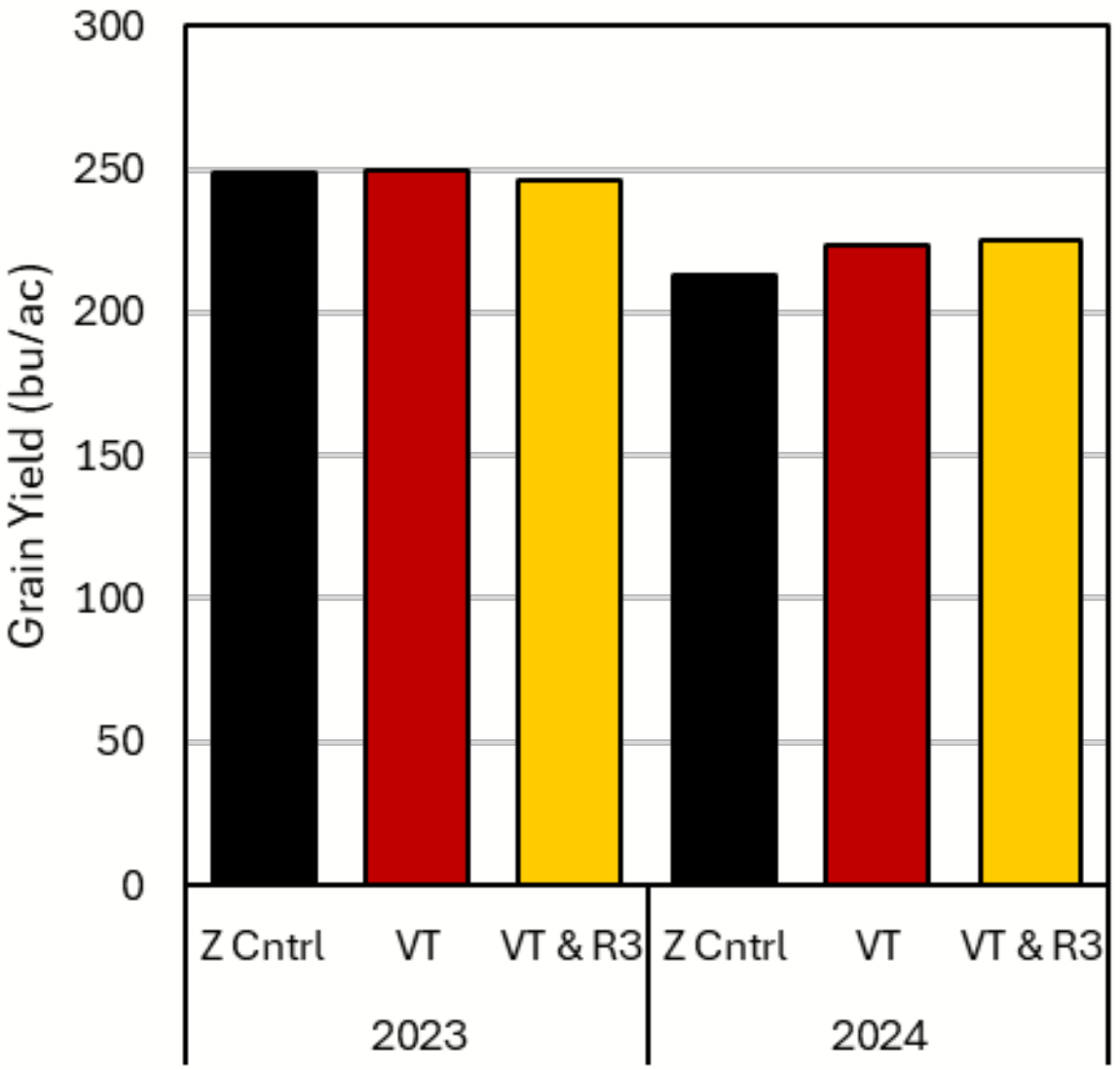


Hybrid x Fungicide Program

Trial – 2023 and 2024 at Ames, IA

- 3 short-stature corn hybrids
- 3 fungicide programs
  - No fungicide control
  - Delaro Complete® at VT
  - Delaro Complete® at VT & R3
- 4 replications

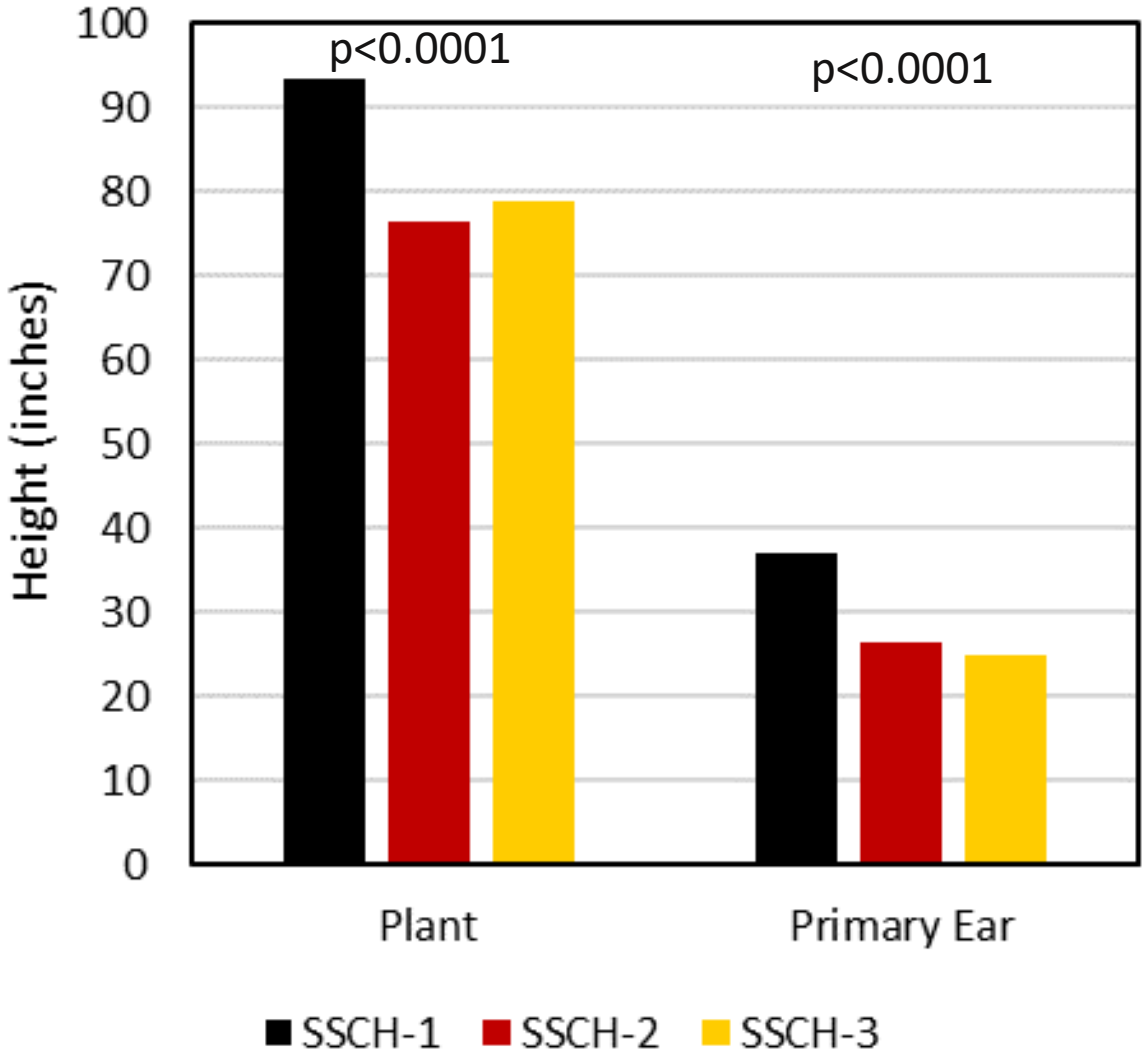

300
250
200
150
100
50
0
Grain Yield (bu/ac)
p=0.0506
p=0.9540
A
B
C
X
Y
Z
2023
2024

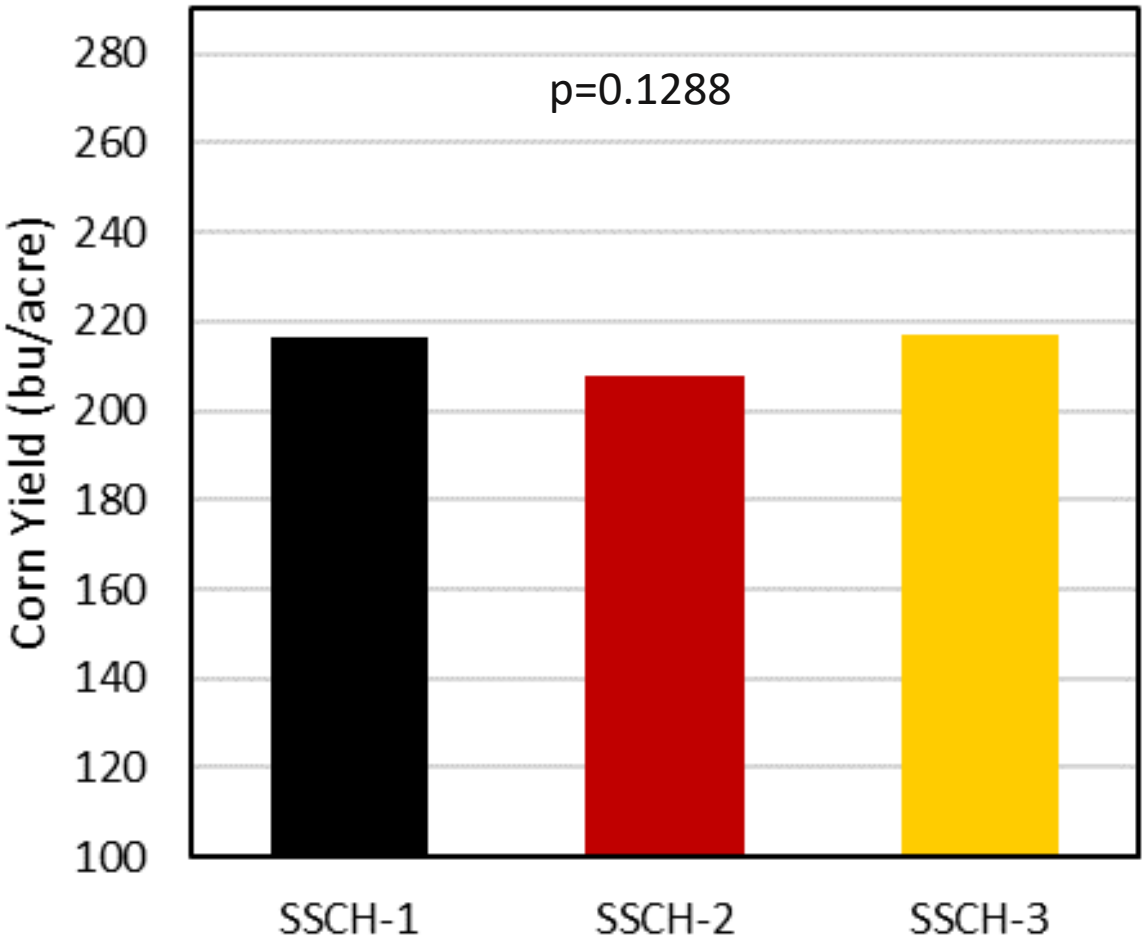

300
250
200
150
100
50
0
Grain Yield (bu/ac)
Z Cntrl
VT
VT & R3
Z Cntrl
VT
VT & R3
2023
2024

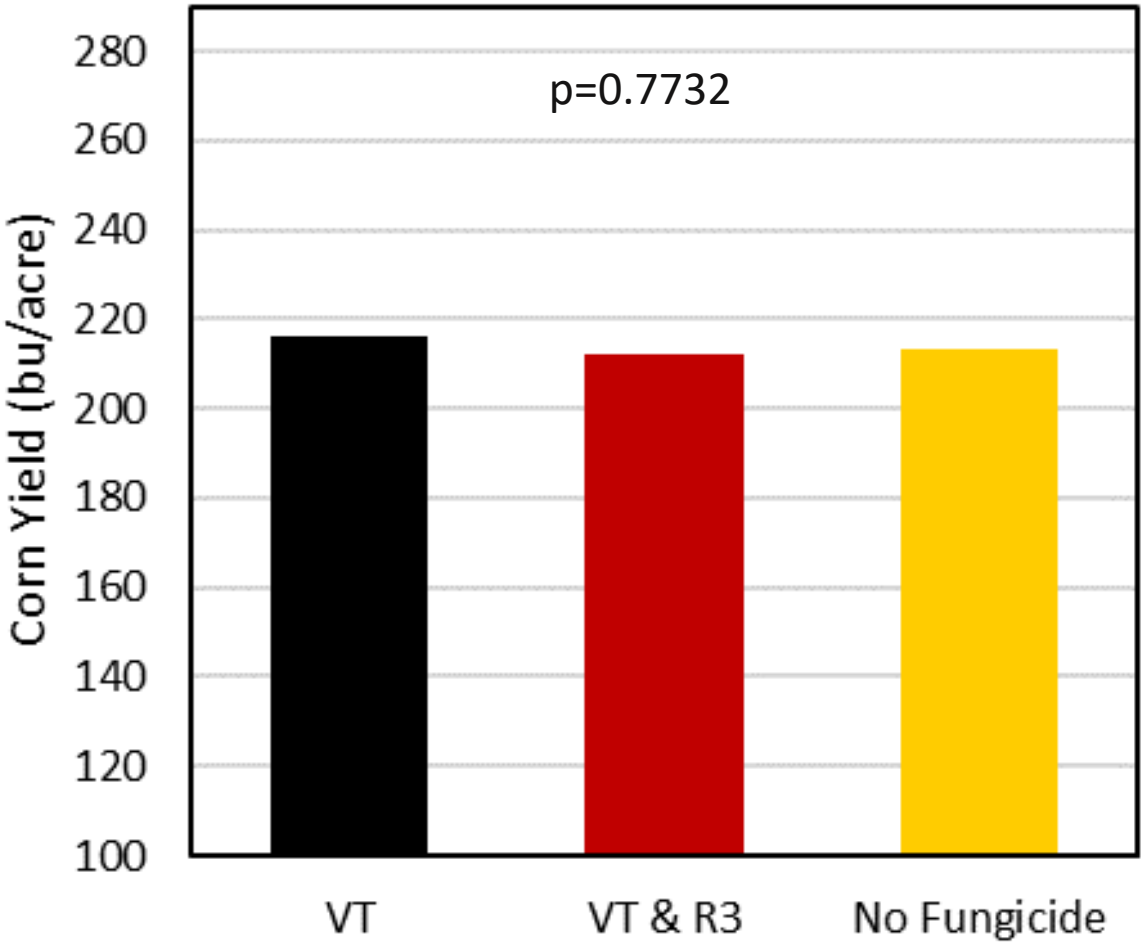
Hybrid x Fungicide Program

Trial – 2023 at Nashua, IA

- 3 short-stature corn hybrids
- 3 fungicide programs
  - No fungicide control
  - Delaro Complete® at VT
  - Delaro Complete® at VT & R3
- 4 replications


100
90
80
70
60
50
40
30
20
10
0
Height (inches)
p<0.0001
p<0.0001
Plant
Primary Ear
SSCH-1
SSCH-2
SSCH-3


280
260
240
220
200
180
160
140
120
100
Corn Yield (bu/acre)
p=0.1288
SSCH-1
SSCH-2
SSCH-3


p=0.7732
Corn Yield (bu/acre)
280
260
240
220
200
180
160
140
120
100
VT
VT & R3
No Fungicide

West Lafayette, IN – 2023; average across 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 ($P > 0.1$).

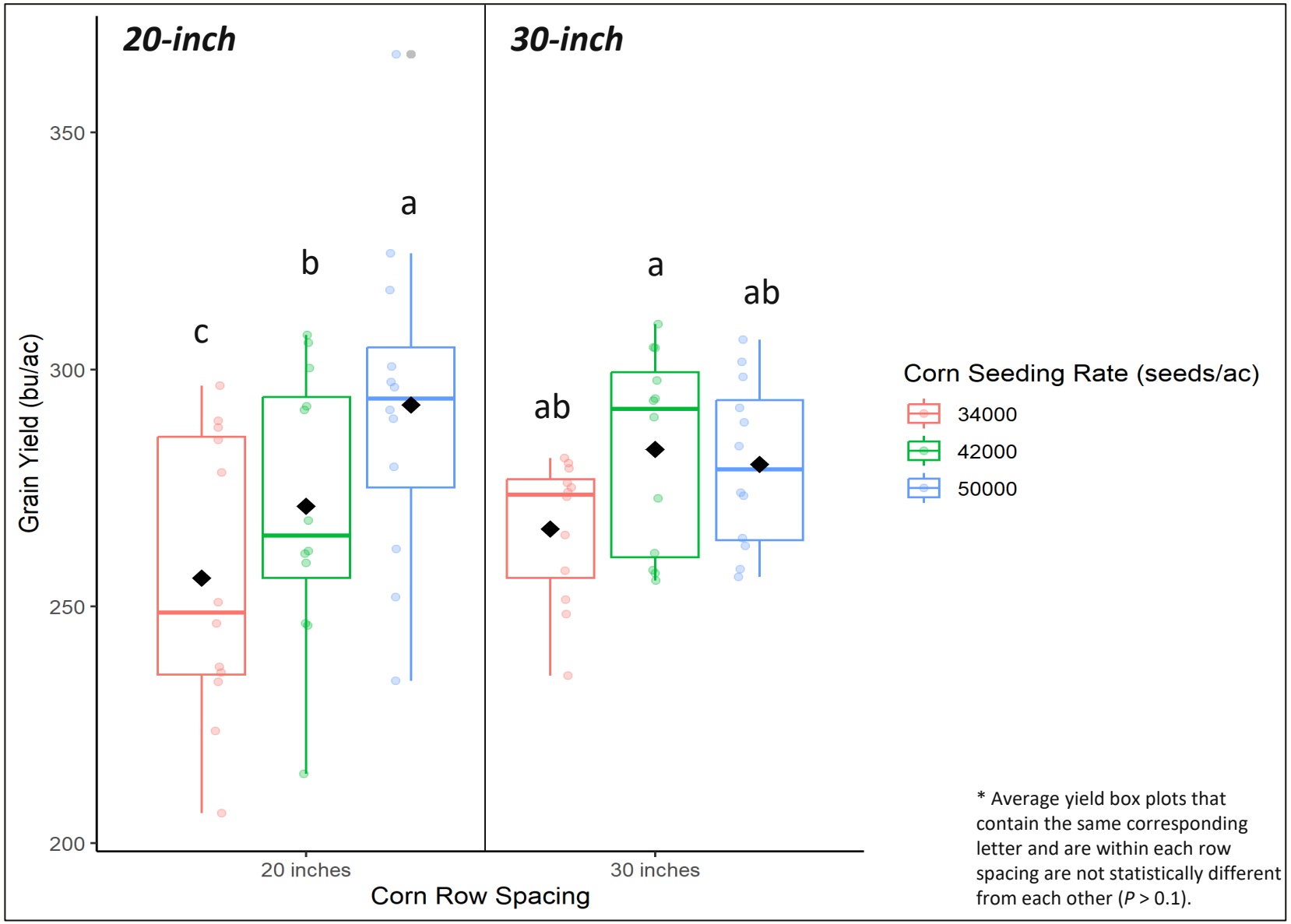
Row Spacing X Seeding Rate

Trial – 2023 at Sutherland, IA

- 1 short-stature corn hybrids
- 2 row spacing
  - 20-inch and 30-inch
- 3 seeding rates
  - 34,000, 42,000, and 50,000 seeds/acre
- 3 replications

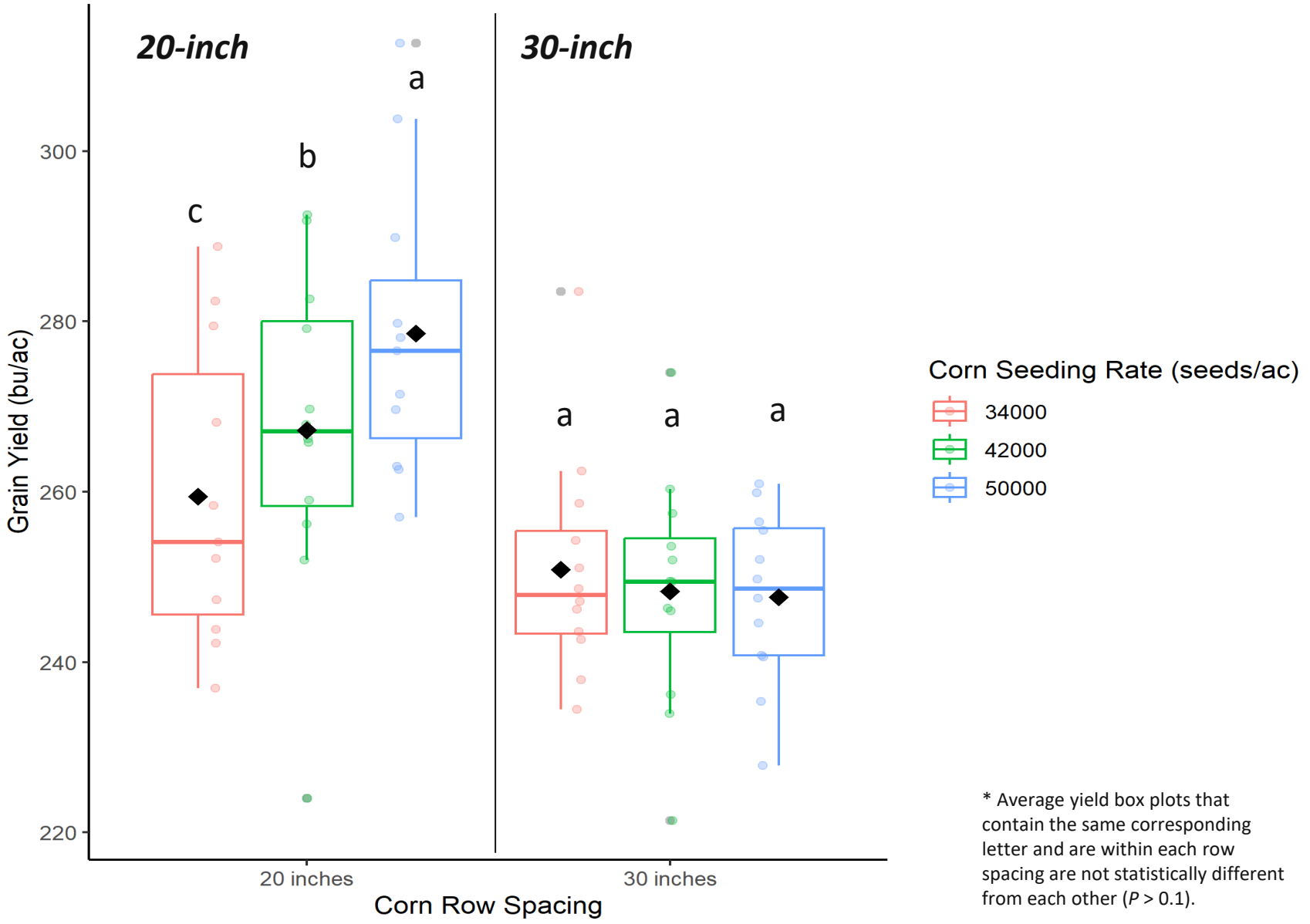
	20-in. row	30-in. row	34,000 seeds/ac	42,000 seeds/ac	50,000 seeds/ac
			grain yield (bushels/acre)		
20-in. row	216.3				
30-in. row		209.2			
	P = 0.0887				
34,000 seeds/ac	210.7	210.1	210.4		
42,000 seeds/ac	215.4	208.3		211.8	
50,000 seeds/ac	222.8	209.3			216.0
	P = 0.4062		P = 0.4705		

West Lafayette, IN - 2023 Interaction between hybrid type and seed rate



* Average yield box plots that contain the same corresponding letter and are within each row spacing are not statistically different from each other ($P > 0.1$).

Wanatah, IN - 2023 Interaction between hybrid type and seed rate



* Average yield box plots that contain the same corresponding letter and are within each row spacing are not statistically different from each other ($P > 0.1$).

Summary

- SSCH do have lower plant and ear heights;
  - Plants generally 70-80”.
  - Ears were almost always above 24”.
- Only have a response to fungicide when disease is present.
- SSCH can have higher optimal seeding rates than TSCH
- SSCH may have higher yield potential in 20-inch rows

Thank You!

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Thanks for sponsoring this research!

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