

2020 Dry Bean Research

Genetic and Agronomic Advancement



Scott Bales
MSU Dry Bean Specialist

2020 Dry Bean Performance Trials

Michiganbean.com

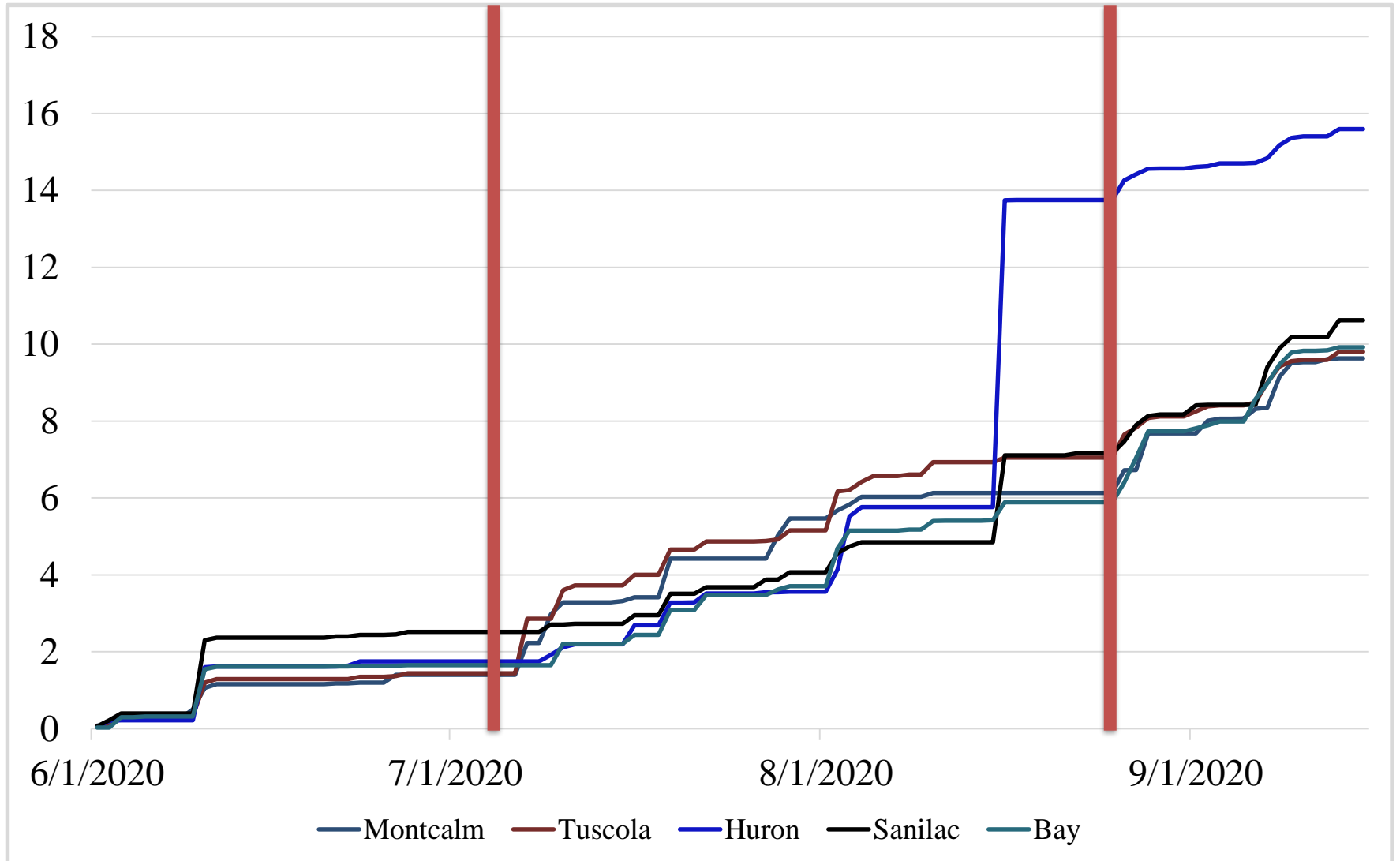
- 148 entries across 10 market classes
- Average Yield:
 - Huron: 32.0
 - Tuscola: 31.7
 - Montcalm: 28.5
 - Bay: 26.0
 - Sanilac: 22.8



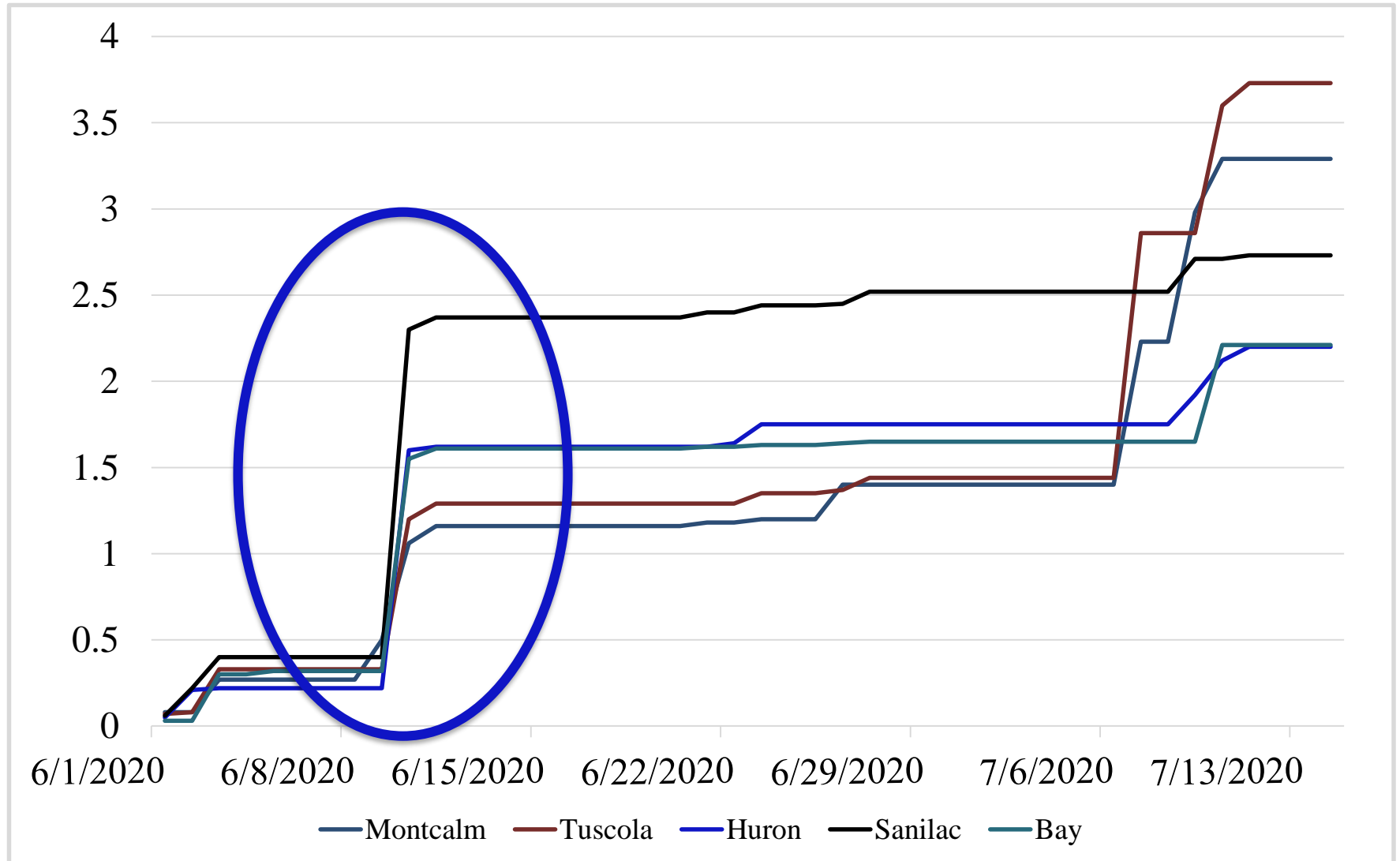
Dry Bean Performance Trials

County	Cooperator	Planting Date
Bay	Schindler Farms	6/7
Sanilac	Aldrich Farms	6/5
Huron	Pawlowski Farms	6/5
Tuscola	Bednarski Farms	6/6
Montcalm	Jaquays Farms	6/15

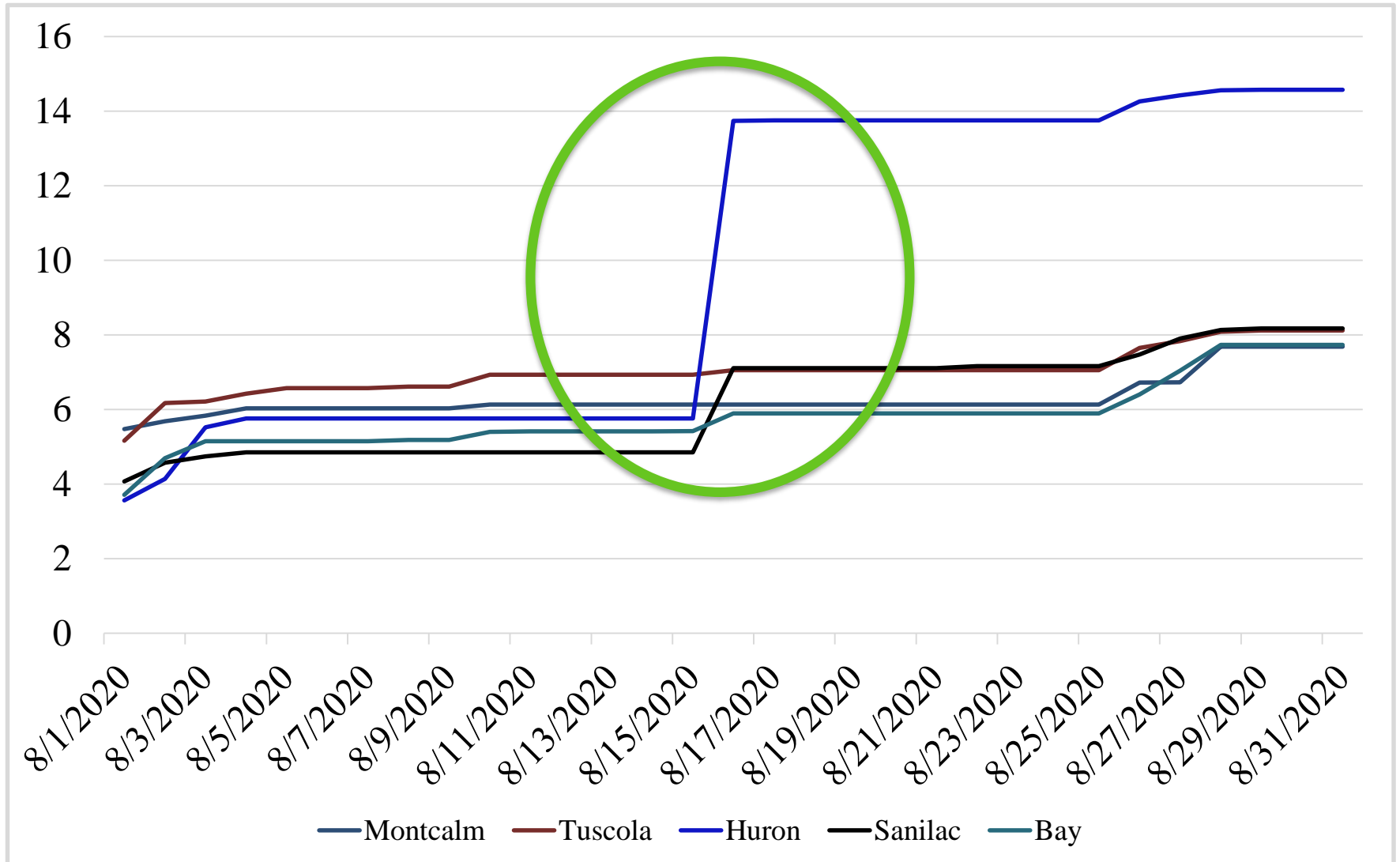
Cumulative Rainfall



Cumulative Rainfall



Cumulative Rainfall



VARIETY	Maturity	Flowering	Plant Height	Lodging	White Mold Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— (1-5) —	— % —	— <i>Lb. A⁻¹</i> —				— <i>Lb. A⁻¹</i> —			<i>seeds Lb⁻¹</i>
Apex	104	38	22.5	3.0	12.7	2691	3679*	2226*	2752	2934*	2849	2886	2028
Argosy	100	44	22.5	2.8	8.4	2815*	3066	1856	2880	2654	2745	2813	2241
Armada	100	45	23.0	2.5	8.4	3147*	2957	2085	3257	2861	2838	2908	1925
Blizzard	98	-	24.0	2.1	16.7	3646**	2942	2673*	3215	3119*	2922*	2848	2220
HMS Bounty	103	-	24.0	2.6	2.2	2381*	3207	2643*	3425*	3179*	2929*	3125**	2387
HMS Medalist	101	45	23.0	2.3	19.9	3368*	3389*	2273*	3808**	3191*	2806	2740	2264
Indi	95	43	23.5	2.0	4.3	2987	2517	1618	3006	2532	2488	2536	2278
Merlin	103	-	23.5	3.0	7.6	2894	3138	2346*	2340	2679	2497	2669	2193
Nautica	103	38	21.0	3.1	13.4	3033*	3089	2153	2793	2751	2573	2514	2233
Shock	98	44	22.0	2.7	14.5	3162*	2773	1639	3099	2668	-	-	2086
Valiant	101	46	23.5	2.7	13.0	3056*	3990**	2061	3135	2995*	2747	-	2178
Vigilant	96	46	25.0	1.5	6.5	2502	3615*	1961	2963	2814	2680	-	2378
12039	100	45	24.0	3.0	8.6	2517	3824*	2119	3362	2769	2942*	-	2180
14068	101	45	25.0	2.9	16.3	3151*	3624*	2060	3295	3285*	2913*	2885	2241
14080	102	45	22.5	2.9	6.9	2258	3091	2416*	2800	2605	2685	-	2207
14084	102	47	24.0	2.1	13.7	3453*	3666*	2281*	3456*	3214*	2879	2903	2392
14089	101	47	22.0	2.5	7.2	3175*	2477	2060	3020	2686	-	-	2270
15094	100	45	23.5	2.5	21.0	3492*	3442*	2227*	3423*	3146*	2987	3016*	2126
15095	104	46	21.5	2.9	14.8	3605*	3530*	2781**	3308	3306**	3152**	3097*	2344
EX1702	100	46	22.0	3.1	10.9	2183	2753	2179	2880	2499	2376	2600	2207
EX1708	102	-	23.0	2.8	18.8	3175*	2569	1751	3121	2712	2367	-	2489
EX1711	100	-	23.0	3.0	13.7	2876	2537	2217	2742	2593	2439	-	2155
EX1801	101	47	23.0	2.2	6.5	2543	3042	1802	2722	2527	-	-	2297
EX1802	96	46	21.0	1.5	11.2	2566	3480*	1418	2799	2703	-	-	2301
EX1803	101	-	22.0	2.5	26.8	2741	3198	2093	2997	2845	-	-	2631
EX1804	97	48	22.0	2.5	2.5	2870	2497	1572	2752	2311	-	-	2266
EX1914	101	47	21.0	3.0	11.9	2062	2761	1893	2922	2623	-	-	2072
N18103	97	42	22.5	2.2	12.7	2731	2906	1359	3002	2500	-	-	2029
N19253	100	-	25.0	2.2	7.9	3346*	3292	2182	3143	2966*	-	-	2237
N19285	102	44	22.0	2.9	7.2	2999	2206	2085	2968	2569	-	-	2104
SV1893GH	103	44	22.5	2.9	3.6	2889	3249	1552	3115	2701	2401	-	2129
MEAN:	100	45	22.9	2.6	11.3	2945	3112	2071	3068	2806	2725	2823	2229
LSD (0.05):	-	-	-	-	NS	617	621	556	399	395	257	182	-
CV:	-	-	-	-	-	17.8%	17.1%	22.9%	11.1%	23.8%	22.9%	19.2%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Questions?

Schindler Farms

Lutz Farms

Pawlowski Farms

Jaquays Farms

Bednarski Farms

LAAKE & Ewald

Aldrich Farms

Farms

Michiganbean.com/research

Scott Bales

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Navy Beans

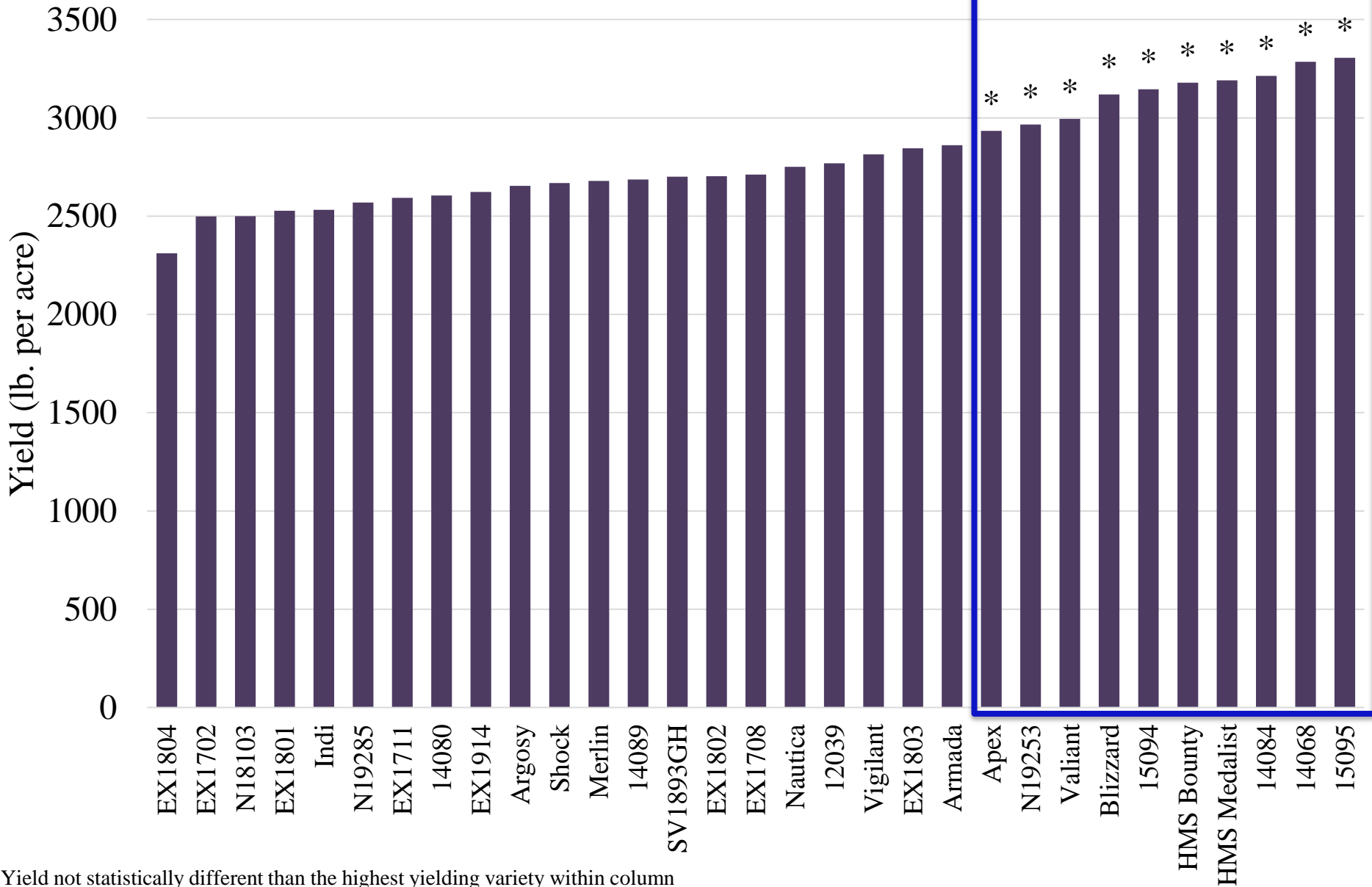
Michiganbean.com

- 31 Entries
 - Commercial: 12
 - Experimental: 19
- Average Yield:
 - Huron: 31.1
 - Tuscola: 30.7
 - Bay: 29.5
 - Sanilac: 20.7



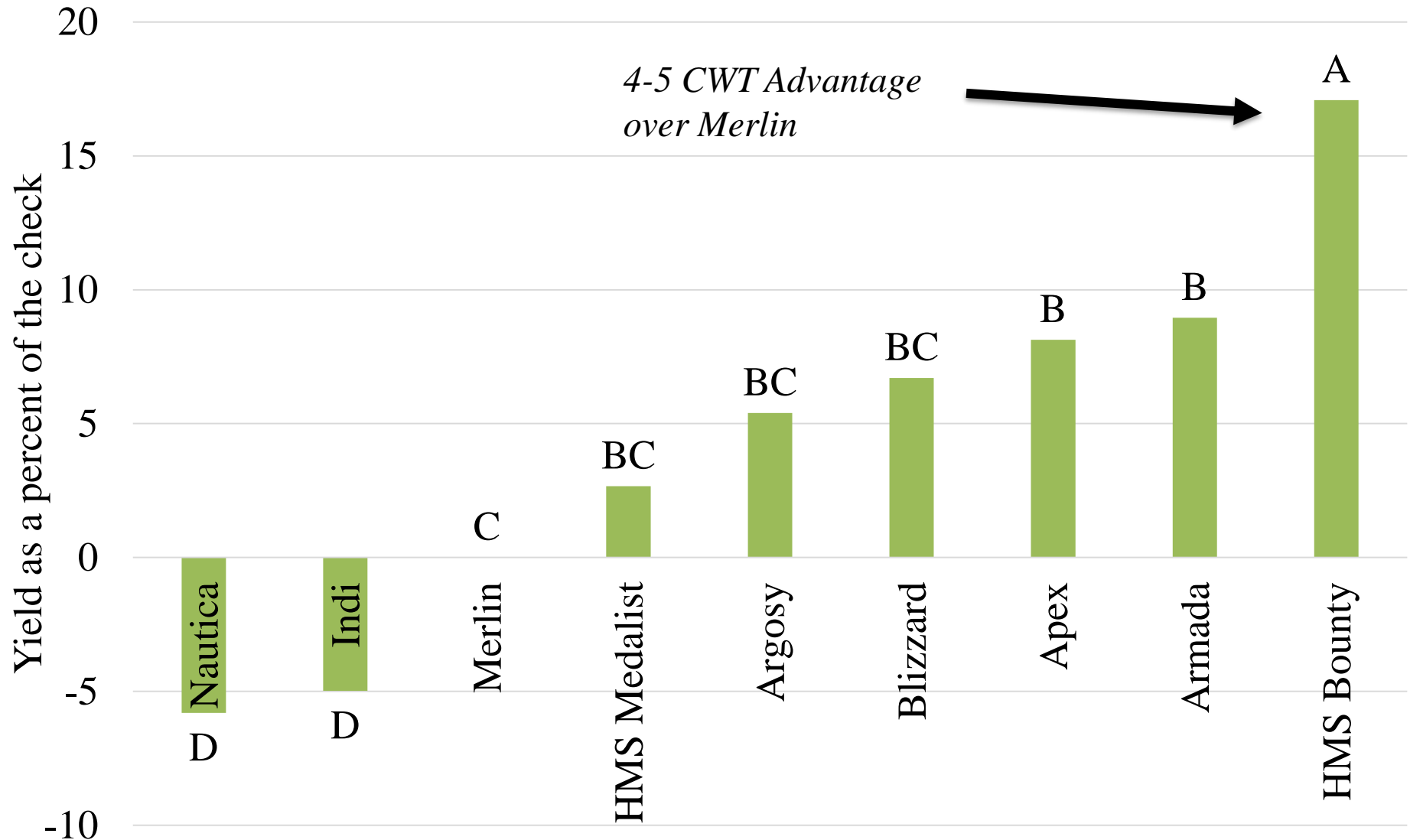
 = 90th percentile

One Year Average



*Yield not statistically different than the highest yielding variety within column

Three Year Average



*Yields followed by the same letter are not significantly different $P \leq 0.05$.

NAUTICA
RANK: 9

INDI
RANK: 8



MERLIN
RANK: 7



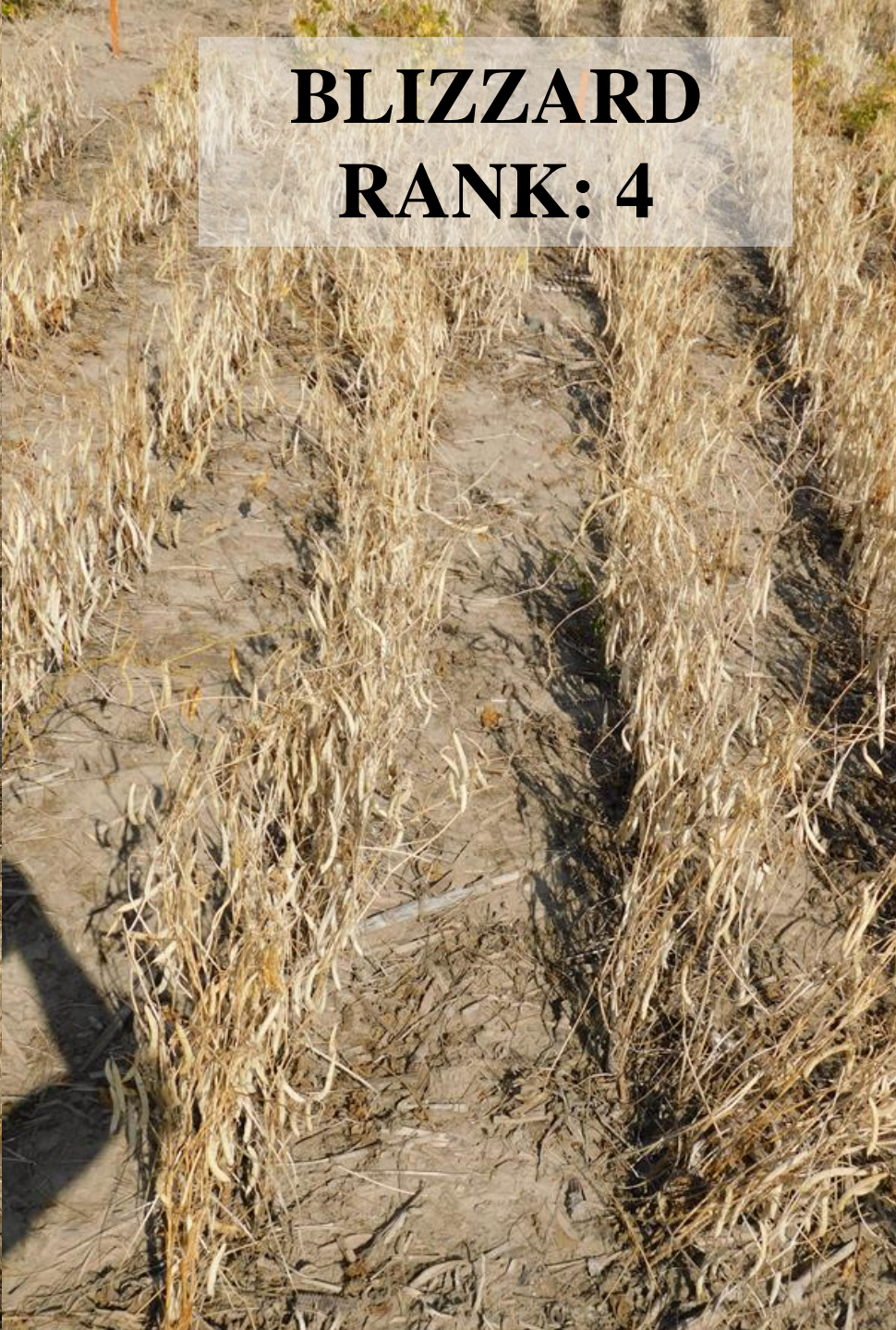
MEDALIST
RANK: 6



ARGOSY
RANK: 5



BLIZZARD
RANK: 4



APEX
RANK: 3

ARMADA
RANK: 2



HMS BOUNTY

RANK: 1



HMS BOUNTY
MATURITY: 100 DAYS
SOURCE: PROVITA

Micronutrient Application Method

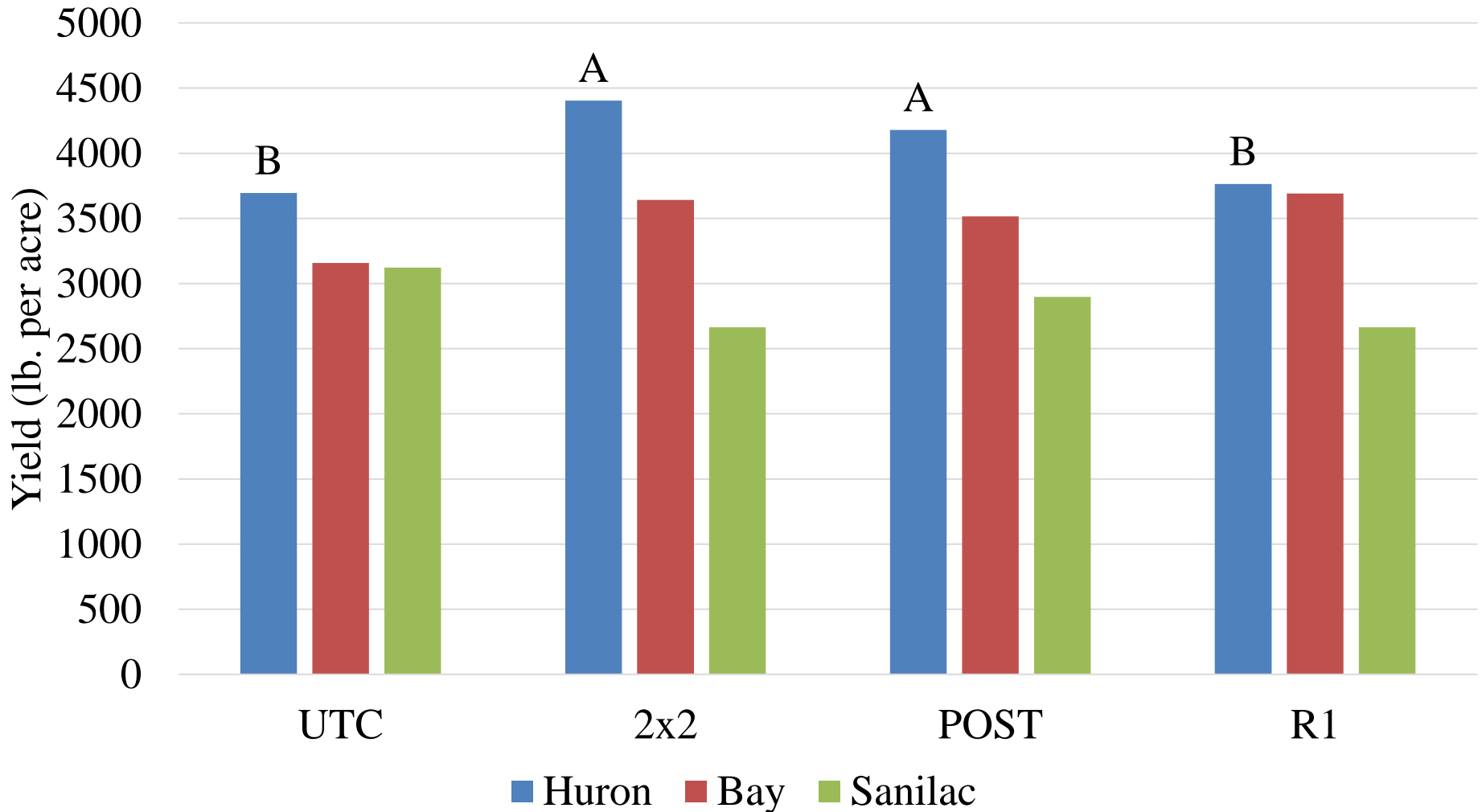
Merlin Navy Beans

Treatment	Method	Product
1	Untreated	No Micros
2	2x2	32 oz. Zn (6%) + 32 oz. Mn (5%)
3	POST	-
4	R1	-



Micronutrient Application Method

Merlin Navy Beans

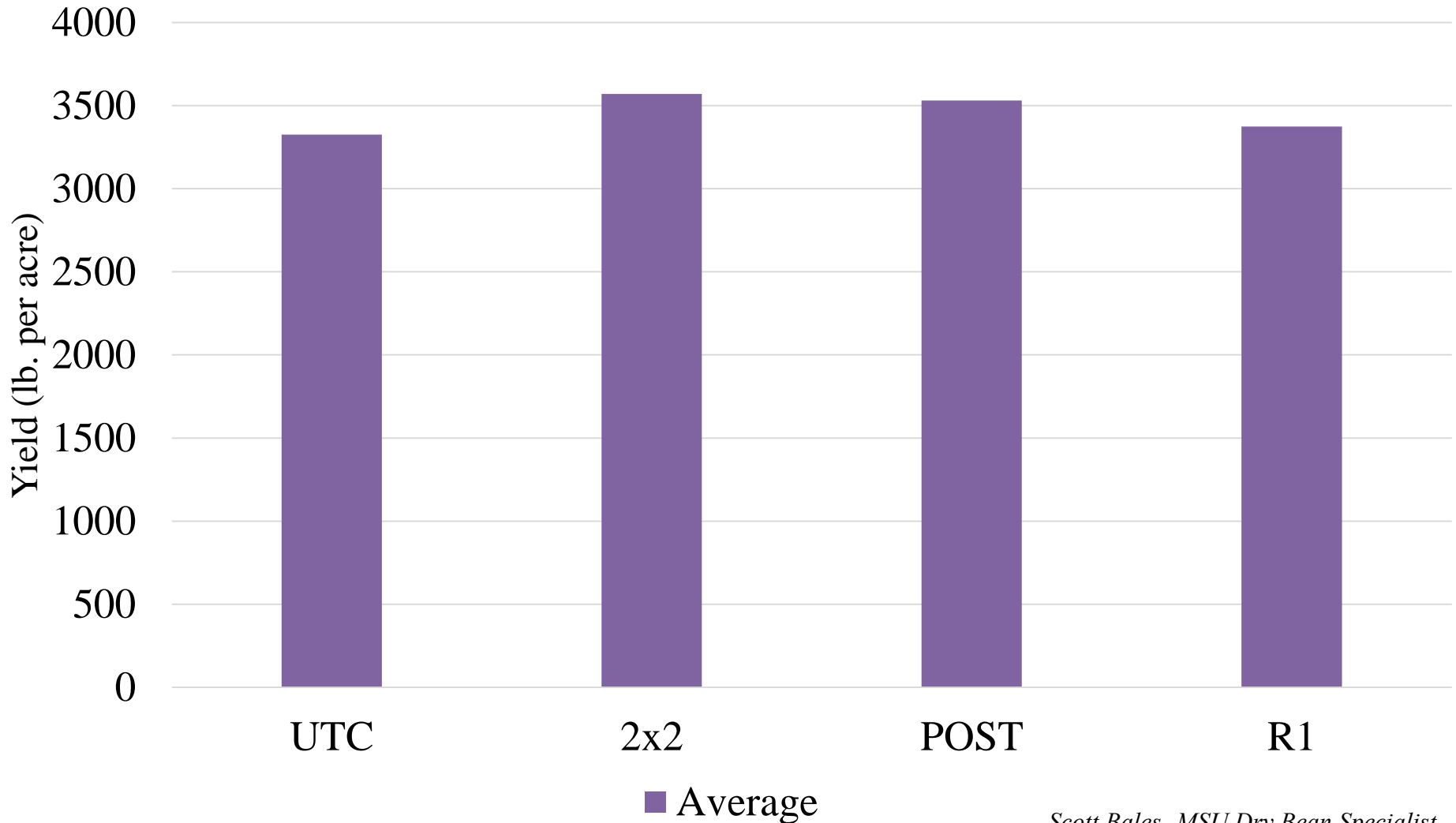


*Means followed by the same letter are not significantly different $P \leq 0.05$.

Scott Bales- MSU Dry Bean Specialist

Micronutrient Application Method

Merlin Navy Beans (non-significant)



Questions?

Schindler Farms Lutz Farms
Pawlowski Farms Jaquays Farms
Bednarski Farms LAAKE & Ewald
Aldrich Farms Farms

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Black Beans

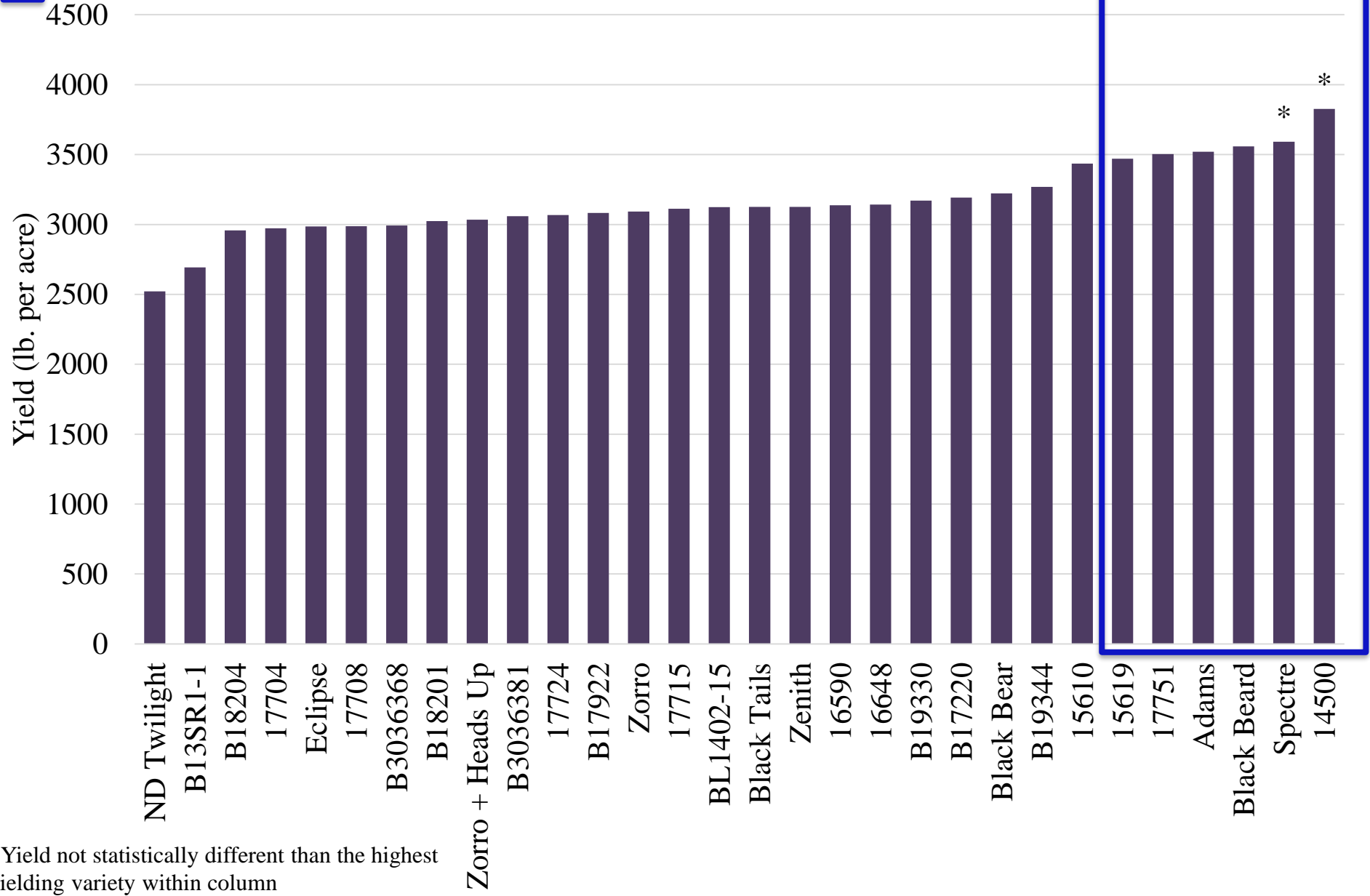
Michiganbean.com

- 29 Entries
 - Commercial: 9
 - Experimental: 20
- Average Yield:
 - Huron: **40.8**
 - Bay: 31.9
 - Tuscola: 30.1
 - Sanilac: 23.7



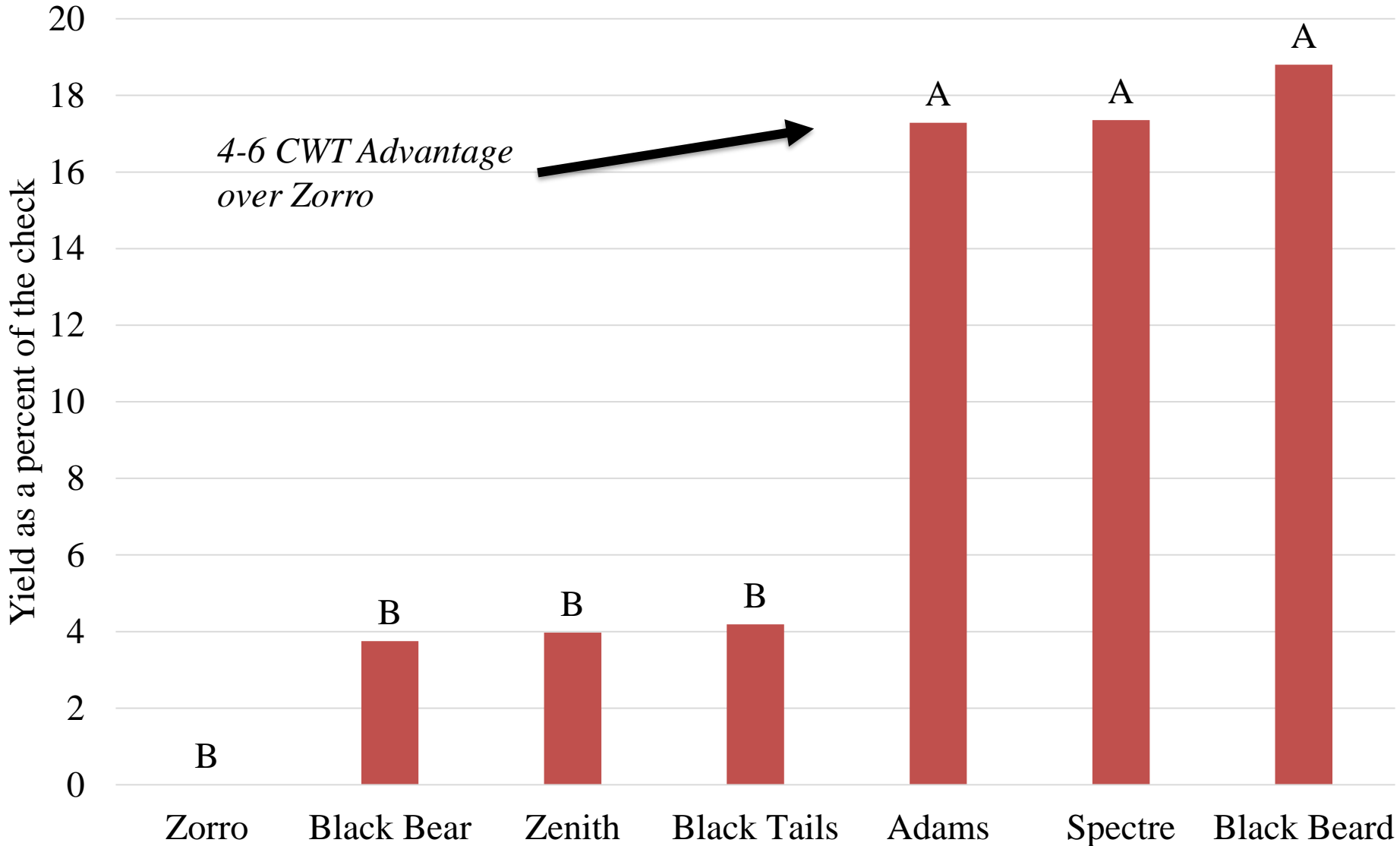
One Year Average

 = 90th percentile



*Yield not statistically different than the highest yielding variety within column

Three Year Average



4-6 CWT Advantage over Zorro



*Means followed by the same letter are not significantly different $P \leq 0.05$.



ZORRO
RANK: 7



BLACK BEAR
RANK: 6



ZENITH
RANK: 5

BLACK TAILS
RANK: 4



**ADAMS
RANK: 3**

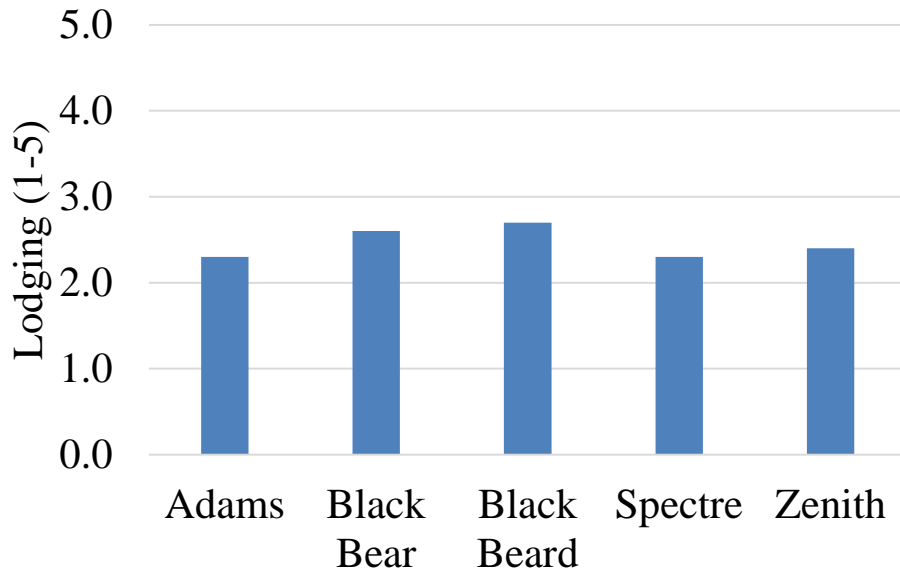


**SPECTRE
RANK: 2**

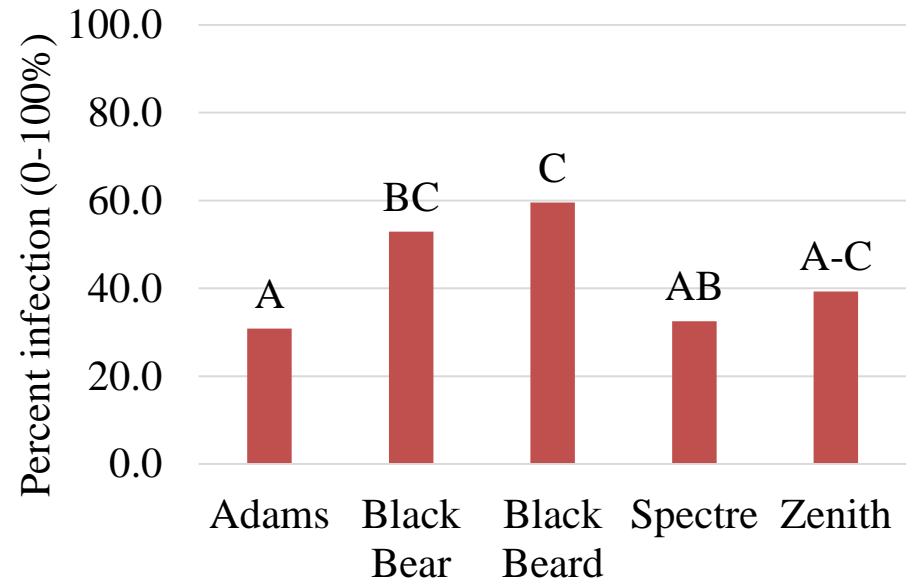


**BLACK BEARD
RANK: 1**

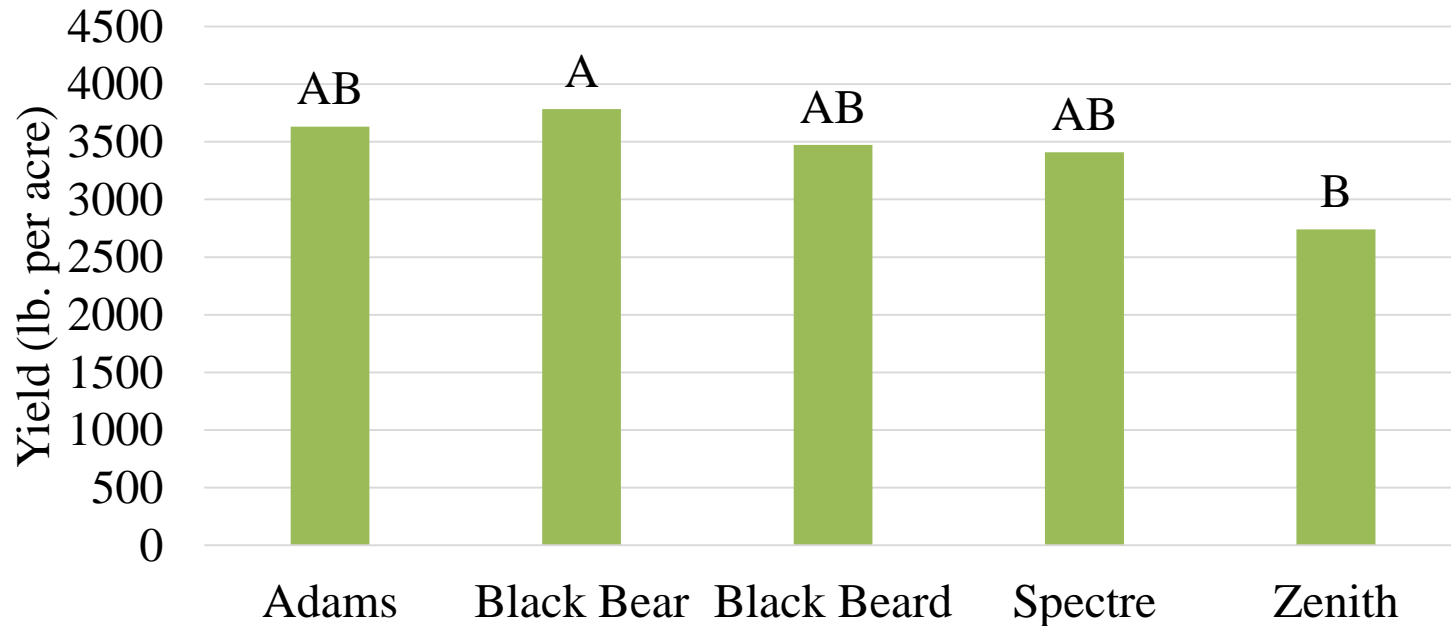
Lodging



White Mold Infection



Yield



*Means followed by the same letter are not significantly different $P \leq 0.05$.



ADAMS
MATURITY: 9 DAYS
SOURCE: ISU



BLACK BEARD
MATURITY: 98 DAYS
SOURCE: PROVITA



SPECTRE

MATURITY: 100 DAYS

SOURCE: PROVITA

Nitrogen Rate X Plant Population

Black Bear Black Beans

- 12 Treatments
 - 4 Locations
 - 4 Nitrogen rates

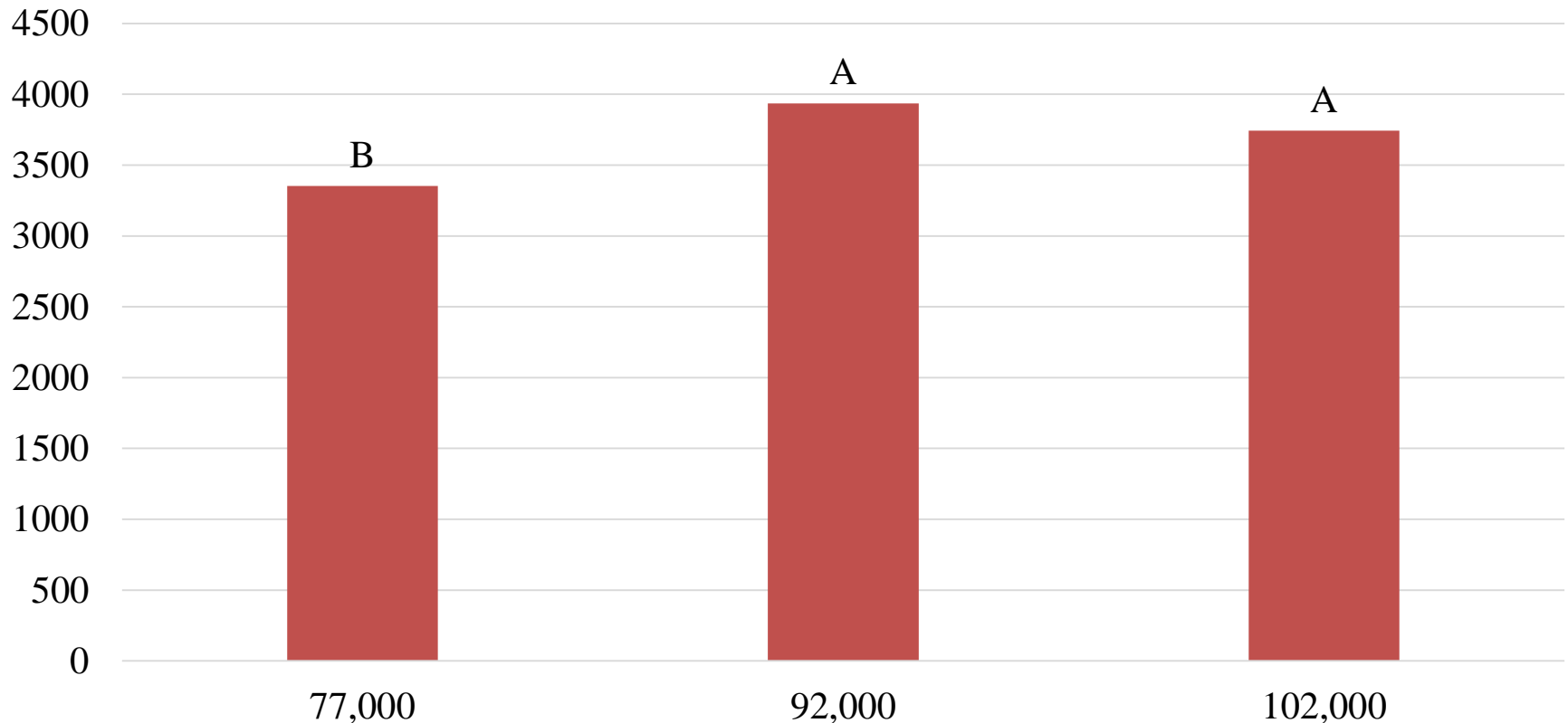
Bay	Huron	Sanilac	Tuscola
0	0	40	40
10	20	50	50
30	60	70	70
50	100	90	90

- 3 Planting populations
 - 100,000
 - 130,000
 - 154,000

Nitrogen Rate X Plant Population

Black Bear Black Beans

- Plant population NOT significant at all locations except for Huron



*Means followed by the same letter are not significantly different $P \leq 0.05$.

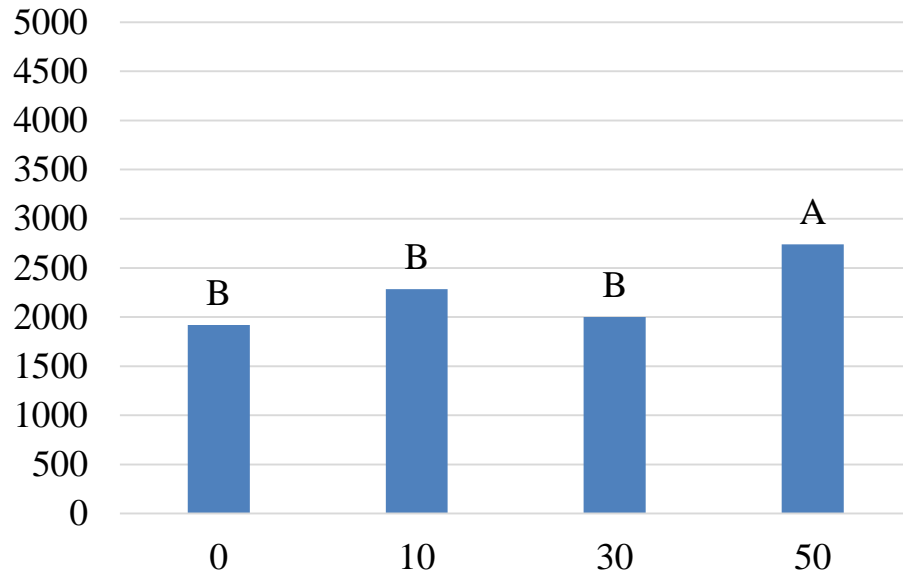
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Nitrogen Rate X Plant Population

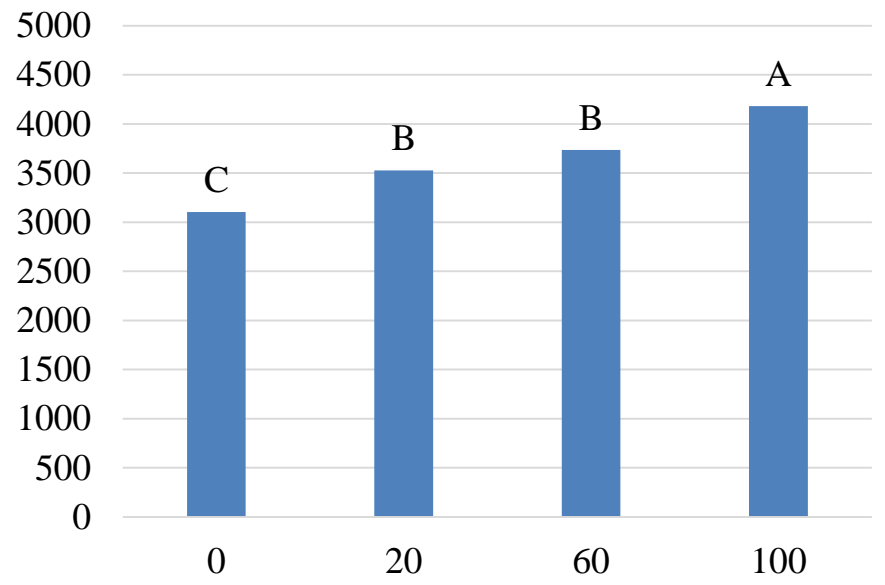
Black Bear Black Beans



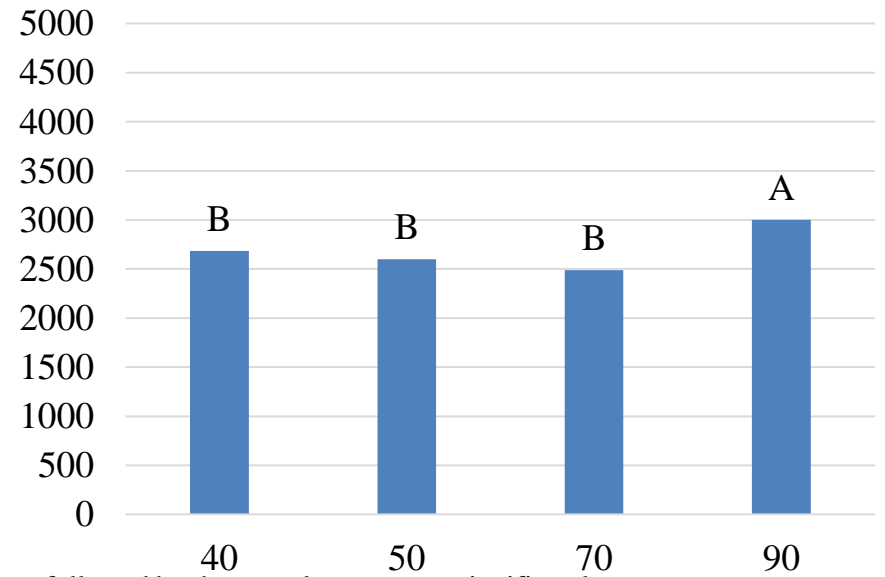
BAY



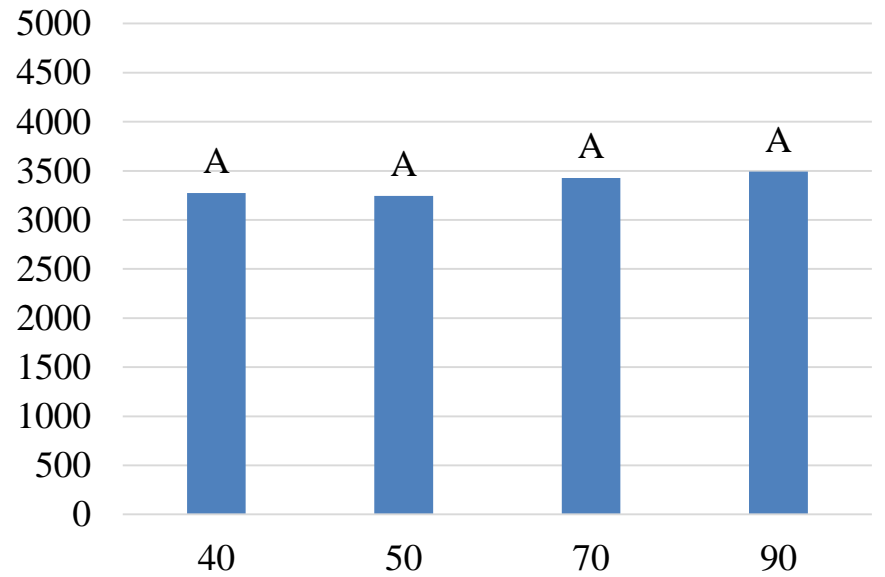
HURON



SANILAC



TUSCOLA



*Means followed by the same letter are not significantly different $P \leq 0.05$.

Nitrogen Rate (lb. per acre)

Nitrogen Rate X Plant Population

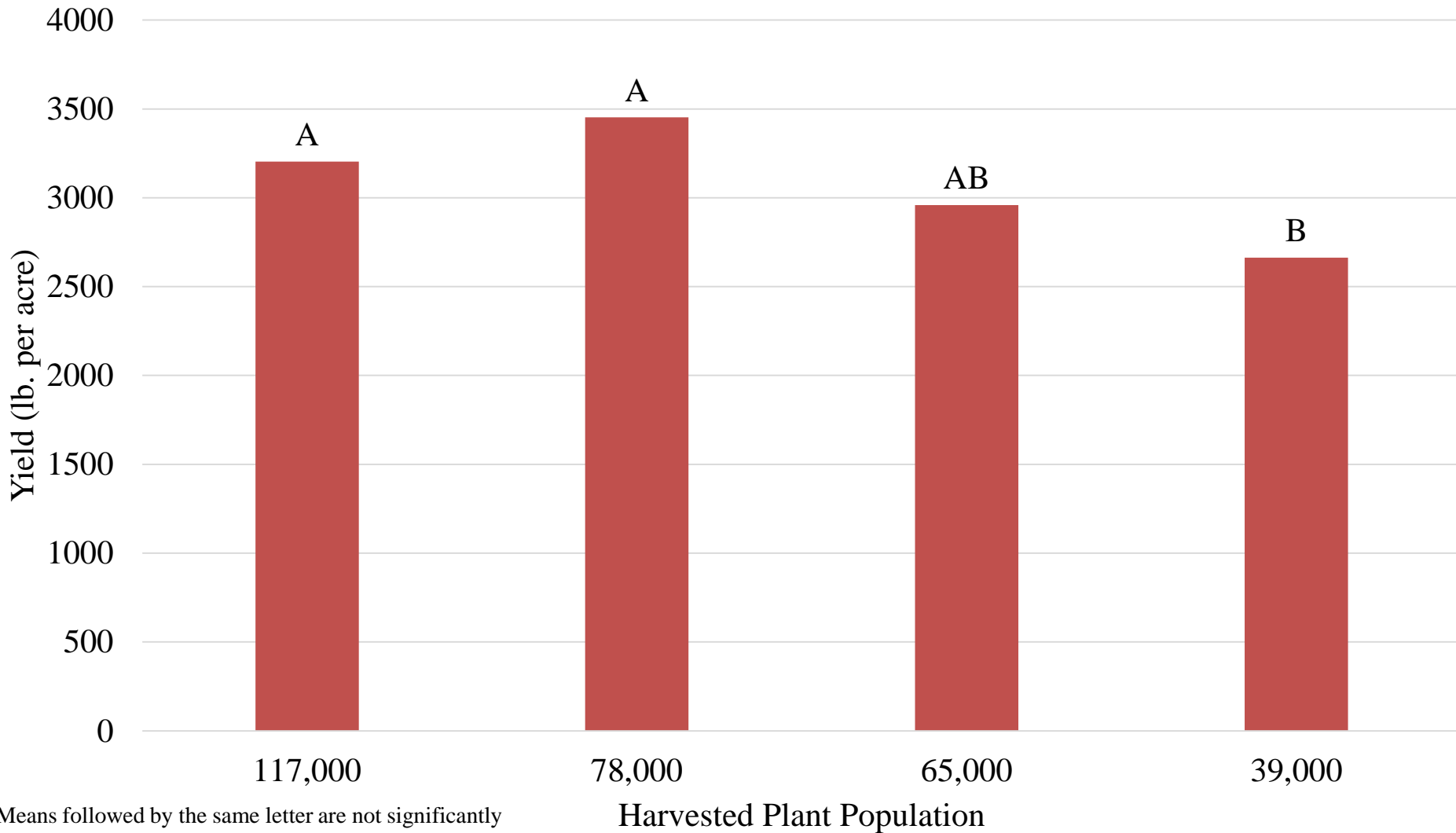
Black Bear Black Beans

- Yield responded to increased rates of Nitrogen, in absence of white mold*
- Most often populations above 70,000 plants did not significantly affect dry bean yield
 - What about lower populations?



Planting Populations (Part II)

Zorro Black Beans



*Means followed by the same letter are not significantly different $P \leq 0.05$.

Questions?

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Small Red Beans

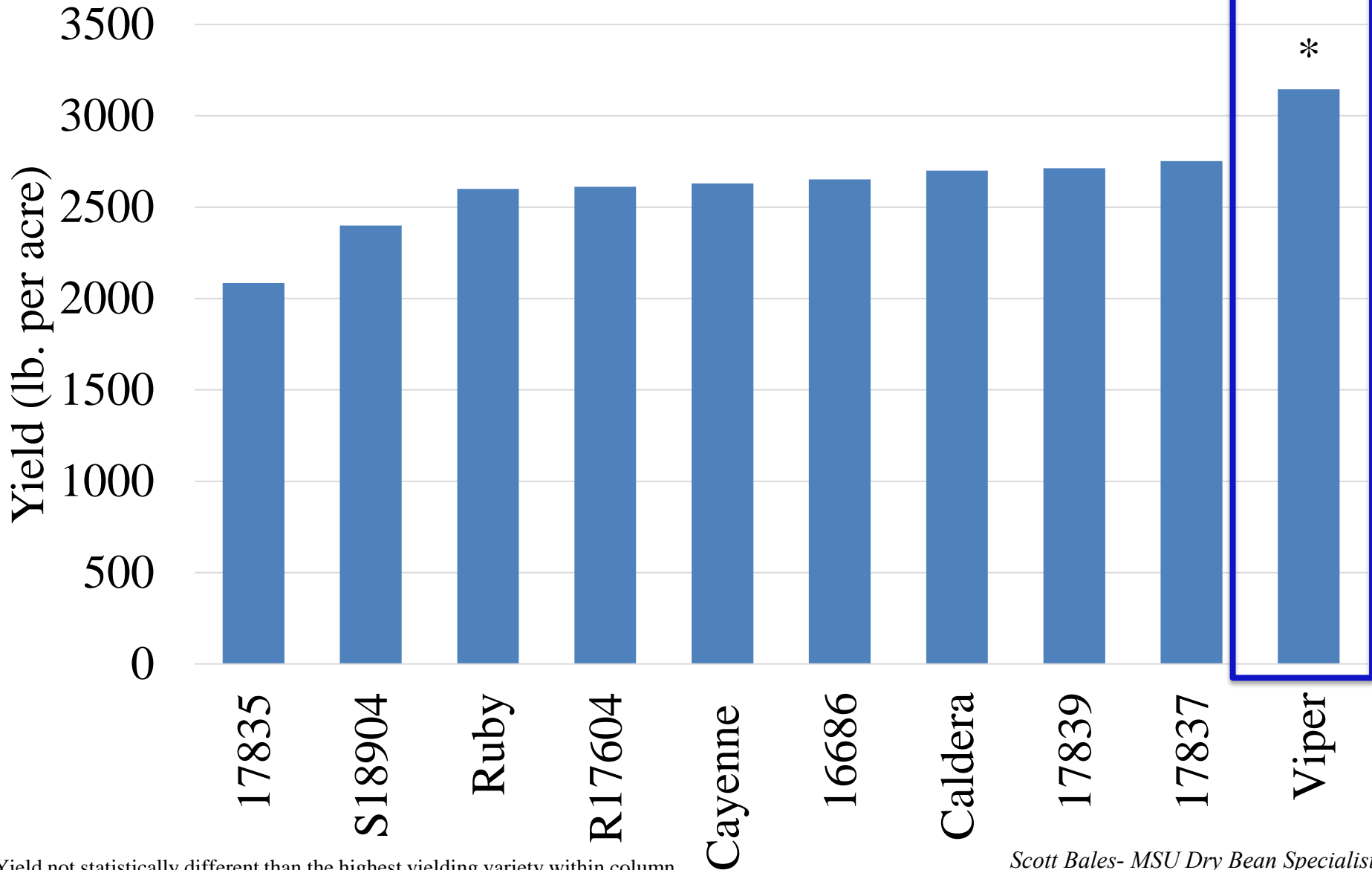
Michiganbean.com

- 10 Entries
 - Commercial: 4
 - Experimental: 6
- Average Yield:
 - Tuscola: 33.5
 - Huron: 26.5
 - Sanilac: 24.6
 - Bay: 20.5



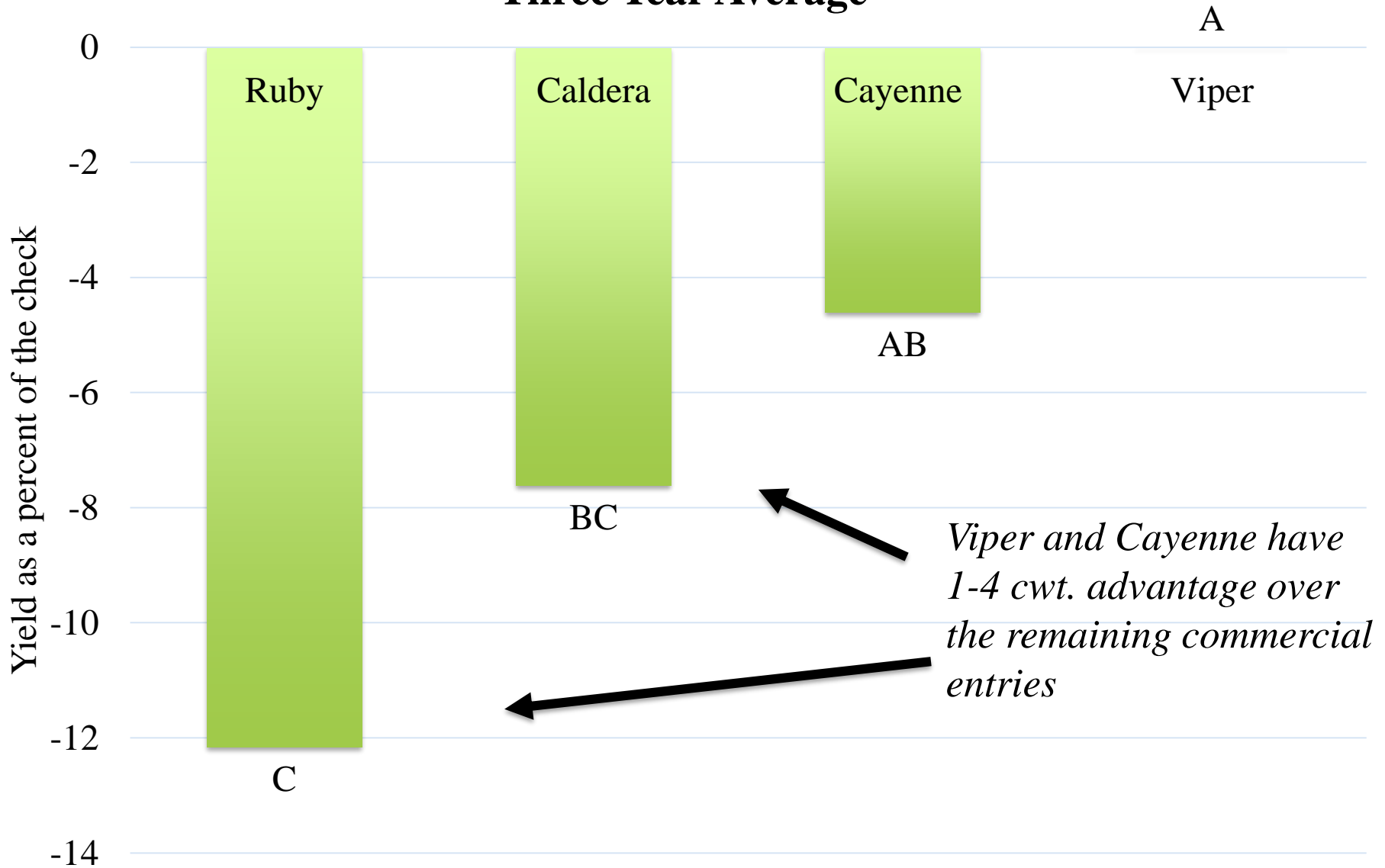
= 90th percentile

One Year Average



*Yield not statistically different than the highest yielding variety within column

Three Year Average



Viper and Cayenne have 1-4 cwt. advantage over the remaining commercial entries

*Means followed by the same letter are not significantly different $P \leq 0.05$.

Propulse for Plant Health

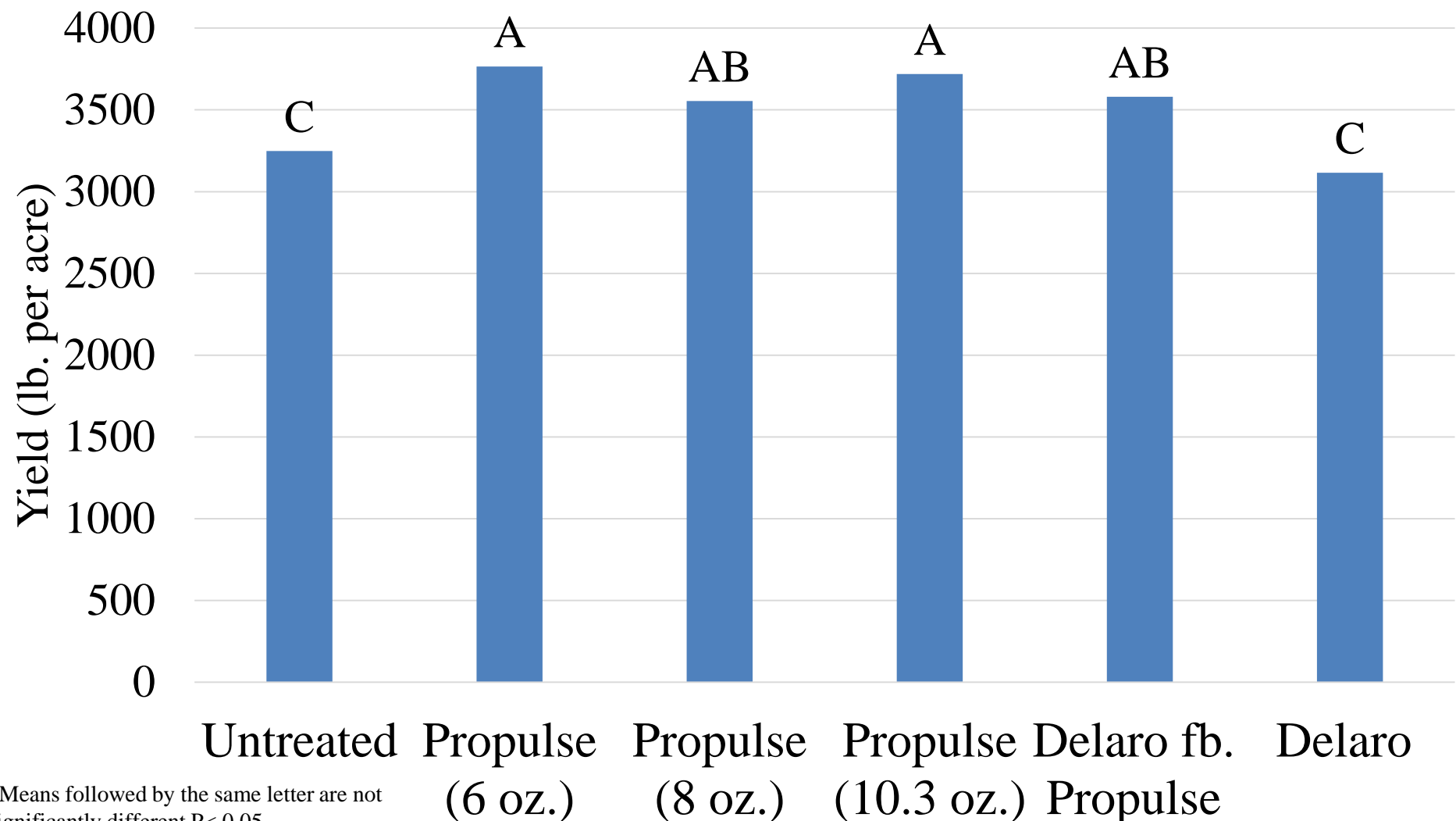
Viper Small Red

- 6 fungicide treatments
 - Untreated
 - Propulse at: 6, 8 and 10.3 oz./A
 - Delaro alone (5.7 or 12 oz./A) and in combination with Propulse
- All treatments had two applications



Propulse for Plant Health

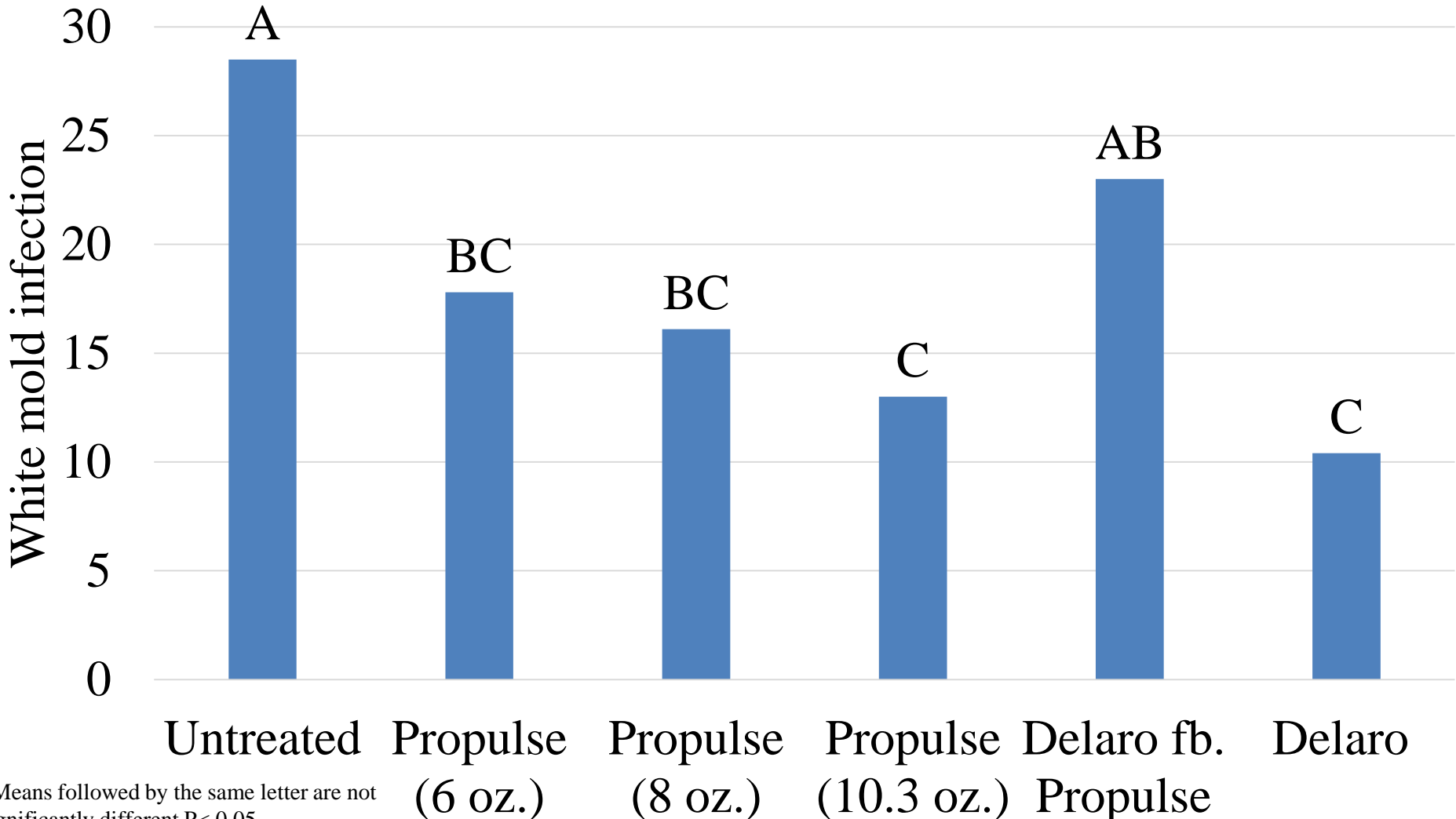
Viper Small Red –Yield



*Means followed by the same letter are not significantly different $P \leq 0.05$.

Propulse for Plant Health

Viper Small Red- White Mold Suppression



*Means followed by the same letter are not significantly different $P \leq 0.05$.

Sanilac and Huron Co. Fungicide Trials

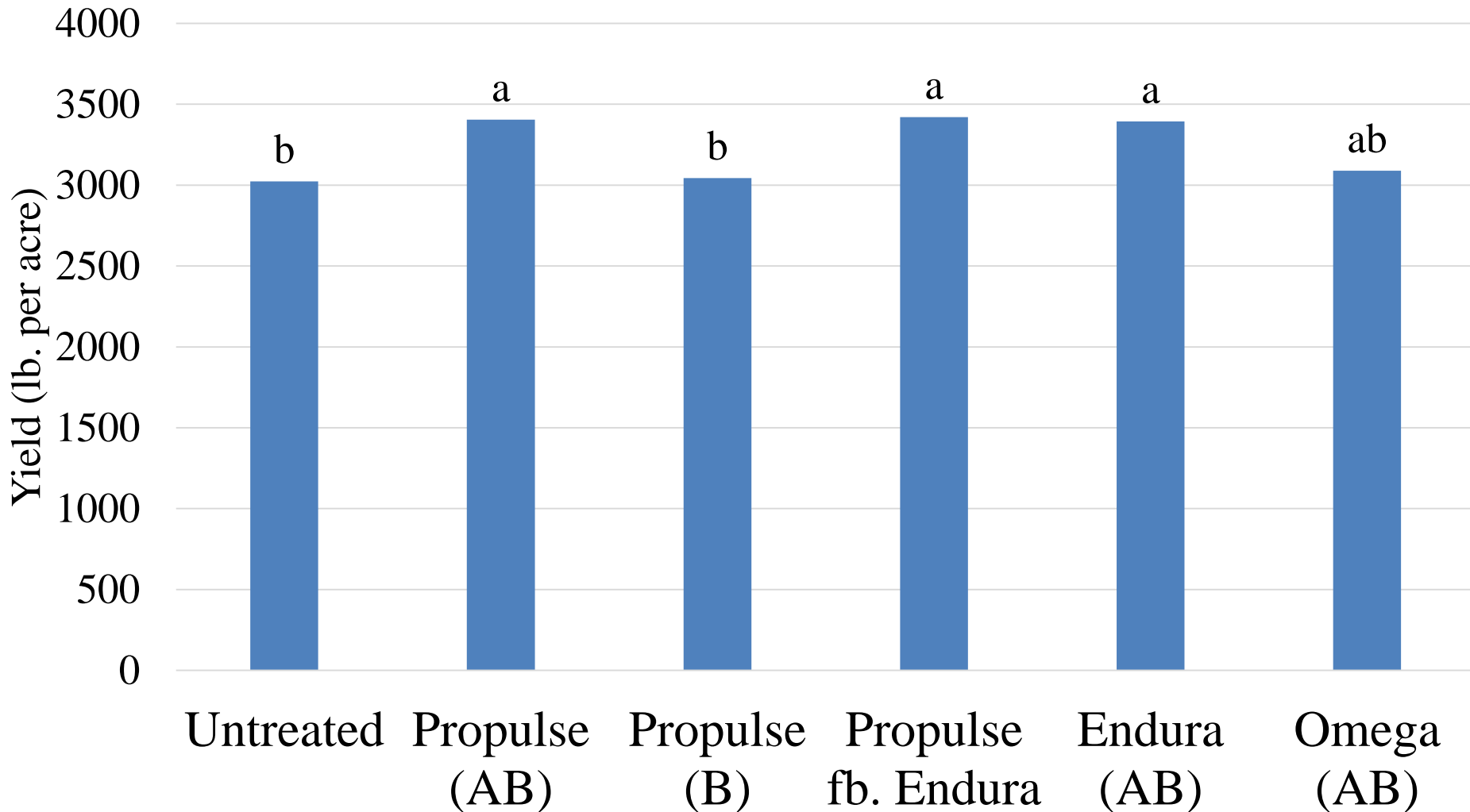
Viper Small Red

- 6 fungicide treatments
 - Untreated
 - Propulse (10.3 fl. oz.)
 - Endura (8 oz.)
 - Omega (8 fl. oz.)
 - Plus combinations and alternative timings
- Single and double applications tested



Sanilac Co. Fungicide Trial

Viper Small Red- Double Applications

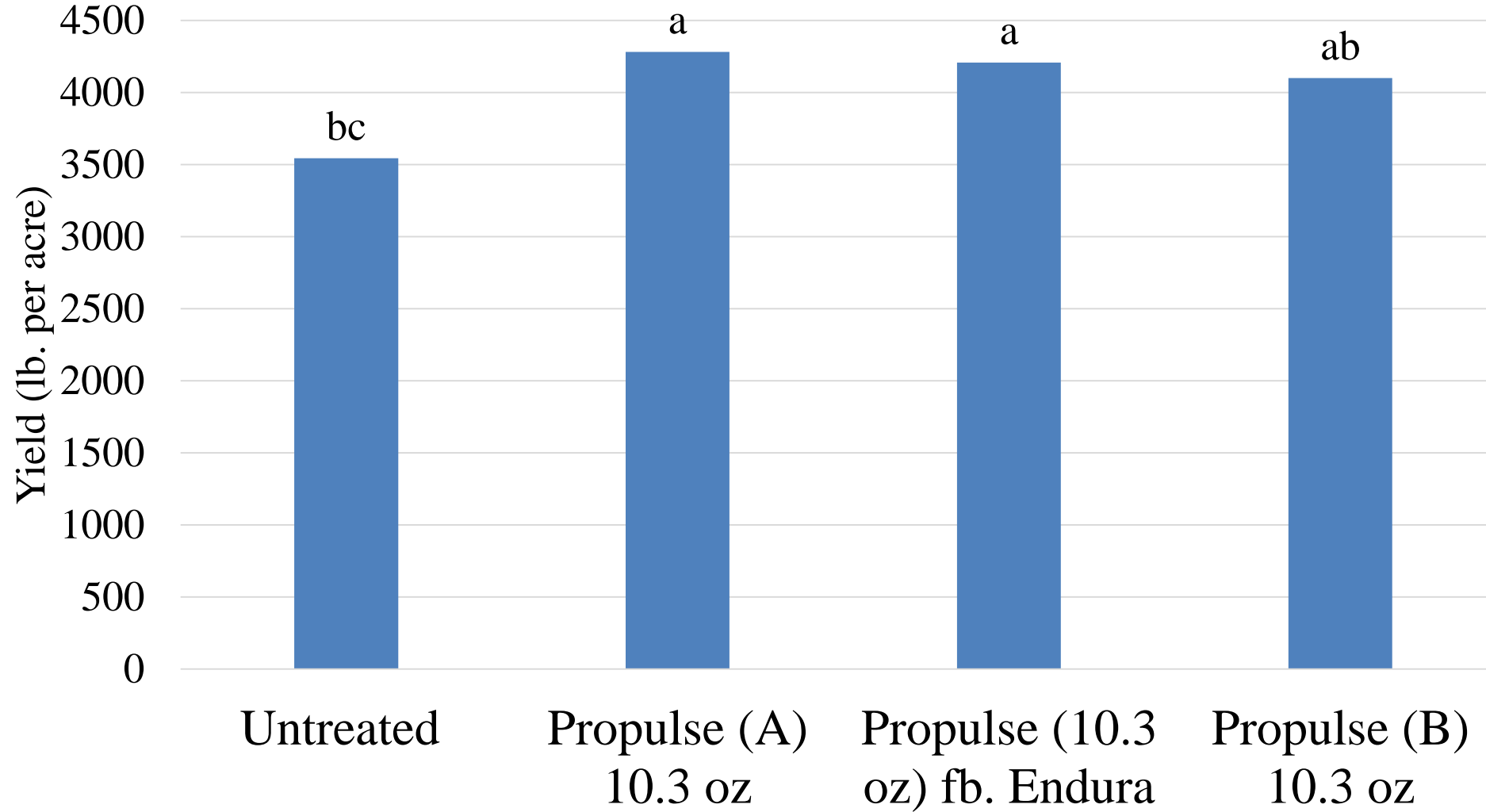


*Means followed by the same letter are not significantly different $P \leq 0.05$.

Scott Bales- MSU Dry Bean Specialist

Dry Land Fungicide Trial- Huron Co.

Viper Small Red- Single Applications



*Means followed by the same letter are not significantly different $P \leq 0.05$.

Questions?

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Pawlowski Farms
Bednarski Farms
Aldrich Farms

Lutz Farms
Jaquays Farms
LAAKE & Ewald
Farms

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Scott Bales

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Pinto and Great Northern

Michiganbean.com

- 13 Entries
 - Commercial: 10
 - Experimental: 3

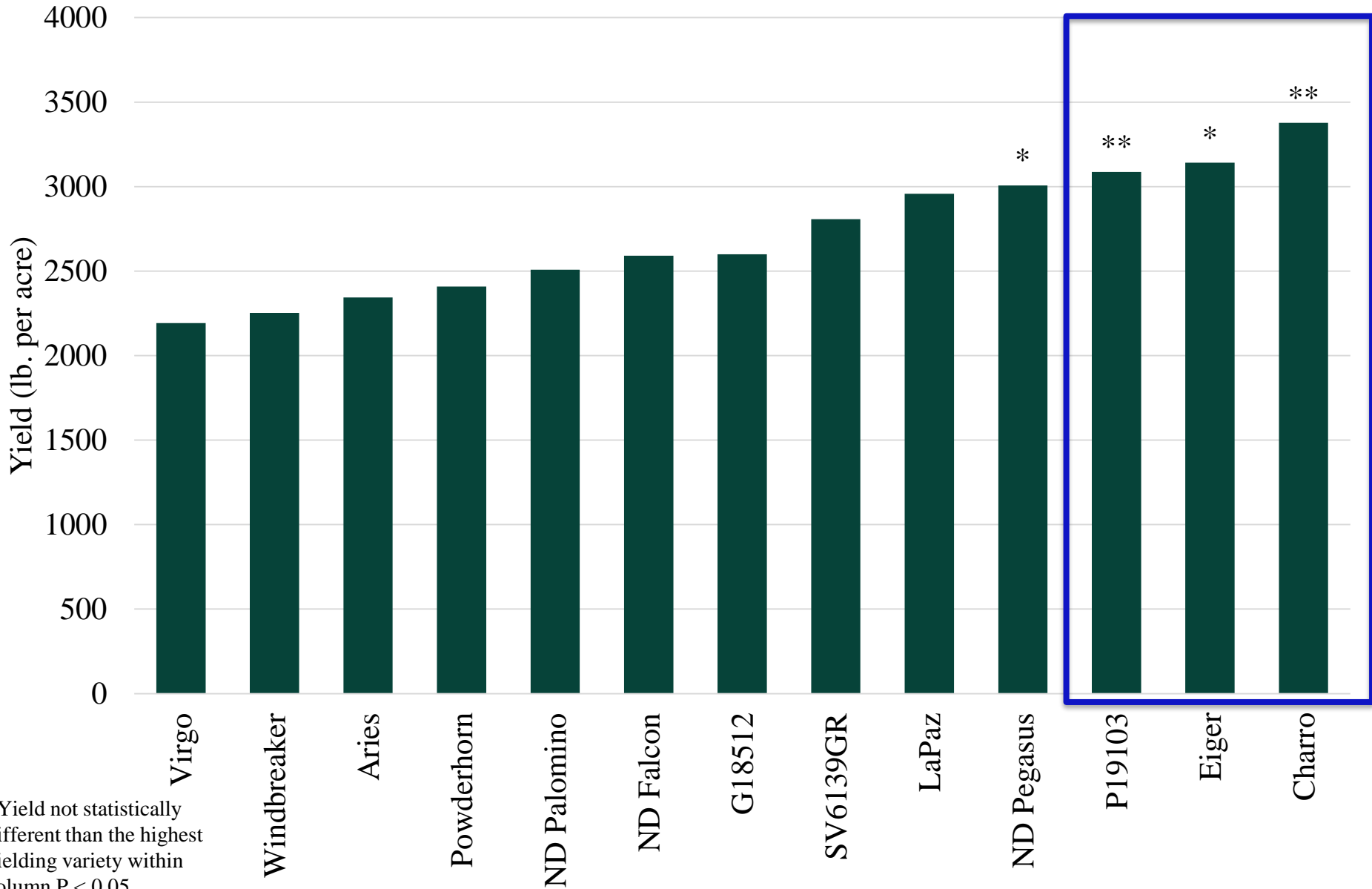


- Average Pinto Yield:
 - Huron: 31.6
 - Tuscola: 31.8
 - Bay: 27.1
 - Sanilac: 23.0

- Average Great Northern Yield:
 - Huron: 30.3
 - Tuscola: 32.3
 - Bay: 21.3
 - Sanilac: 21.6

Pinto and Great Northern One Year Average

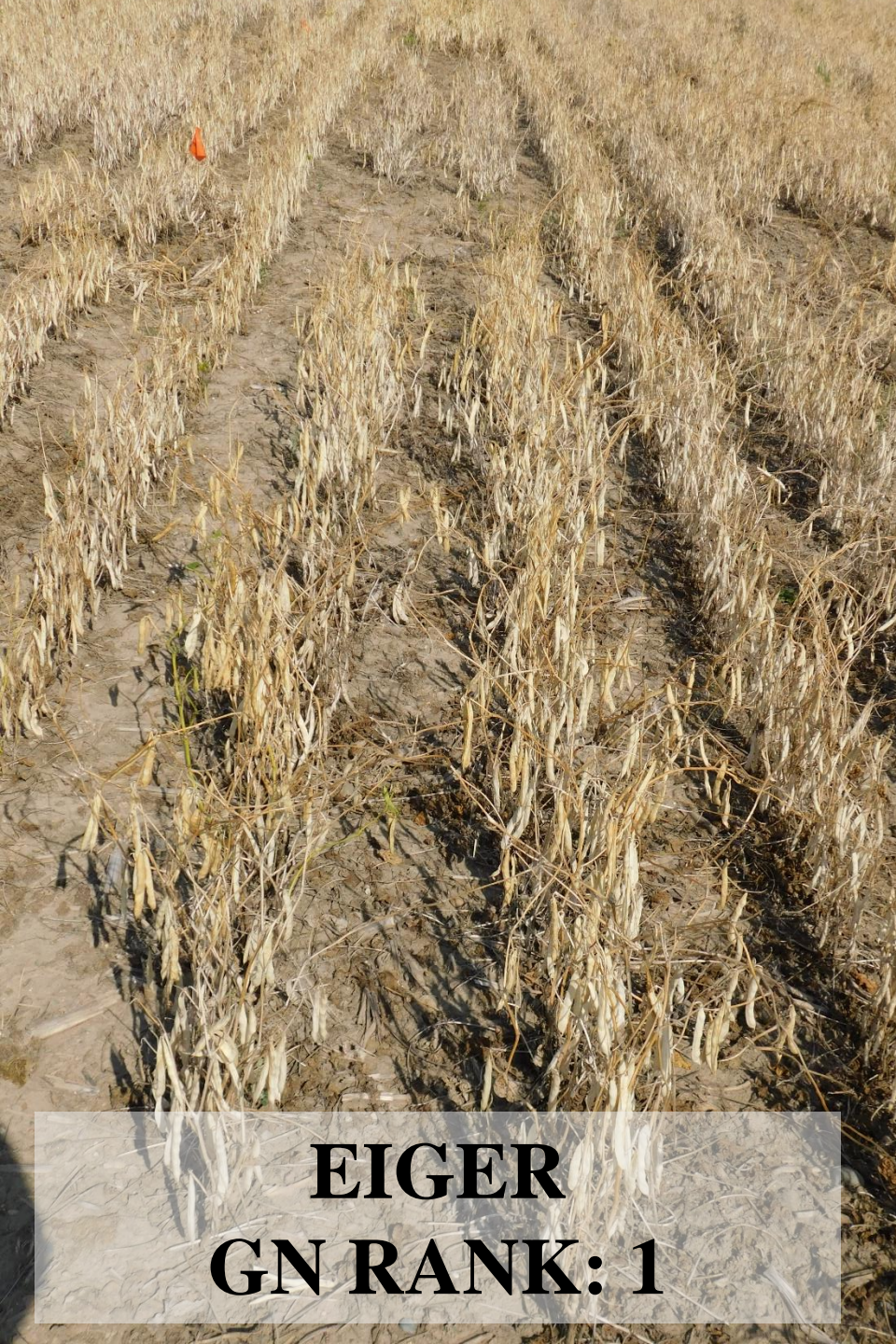
 = 90th percentile



*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$



CHARRO
PINTO RANK: 1



EIGER
GN RANK: 1

Questions?

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Cranberry, Kidney, and Yellow Beans

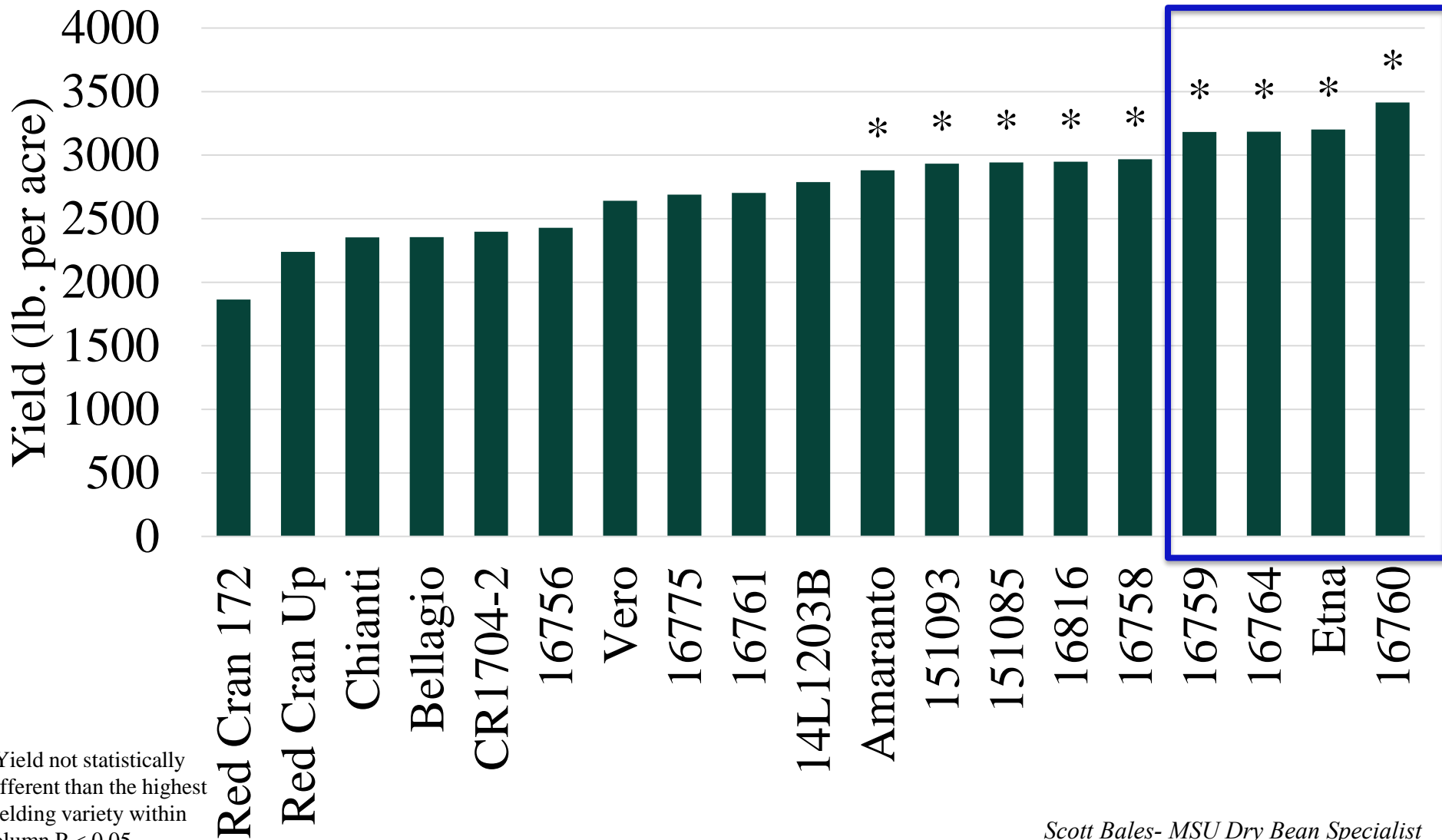
Michiganbean.com

- 62 Entries
 - Commercial: 30
 - Experimental: 32
- Average Cranberry:
 - Irrigated: 27.5
 - Dry Land: 22.9
- Average Light Red Kidney:
 - Irrigated: 26.4
 - Dry Land: 22.4
- Average Dark Red Kidney:
 - Irrigated: 26.3
 - Dry Land: 22.7
- Average White Kidney:
 - Irrigated: 27.0
 - Dry Land: 22.7
- Average Yellow:
 - Irrigated: 26.1
 - Dry Land: 24.2

Large Seeded Beans

Cranberry- One Year Irrigated

 = 90th percentile



*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$

3-Year Irrigated Rank



CHIANTI
MATURED IN 30 DAYS
SOURCE: SEMINIS
RANK: 2

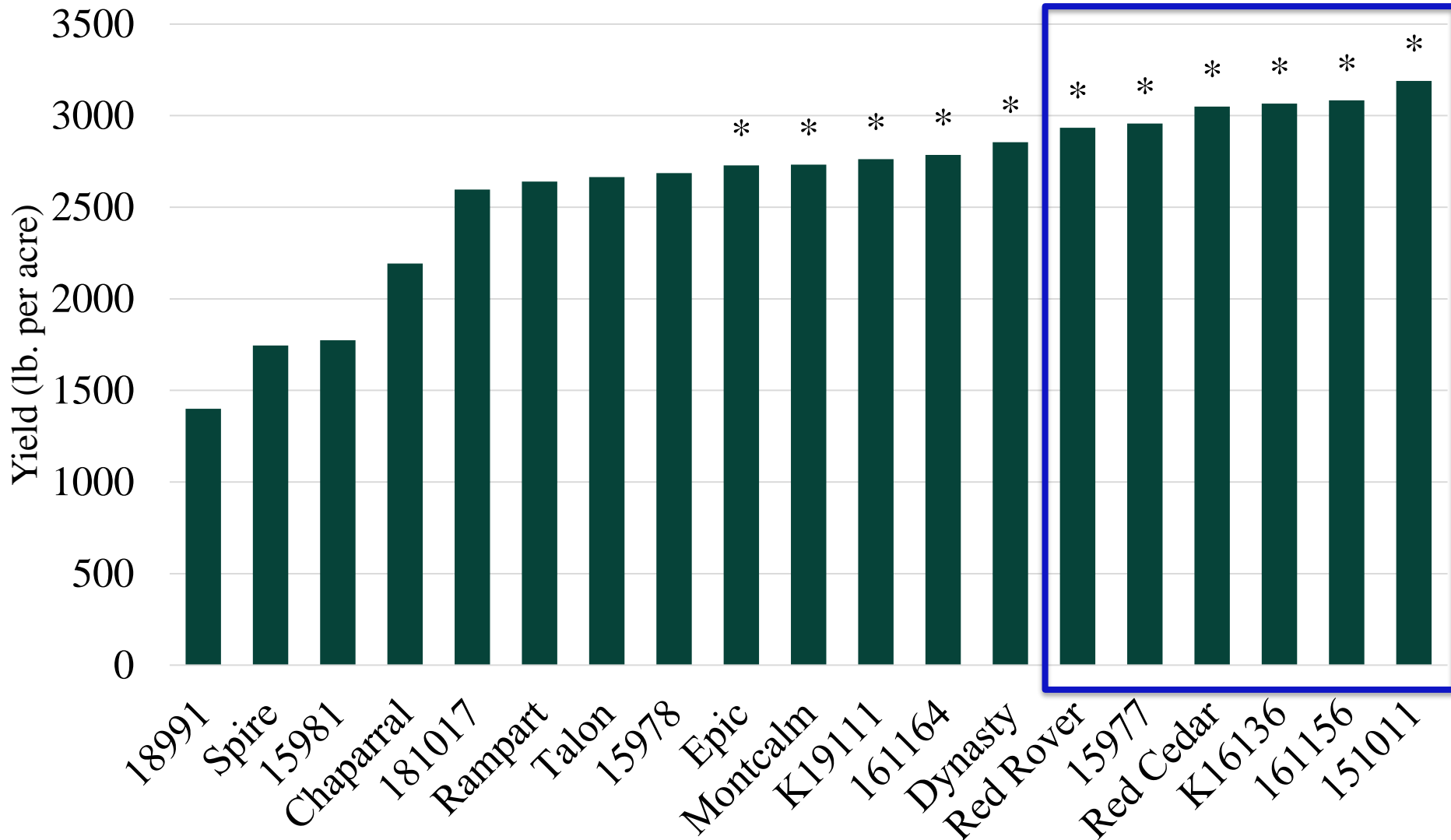


ETNA
RANK: 1

Large Seeded Beans

Dark Red Kidney- One Year Irrigated

 = 90th percentile

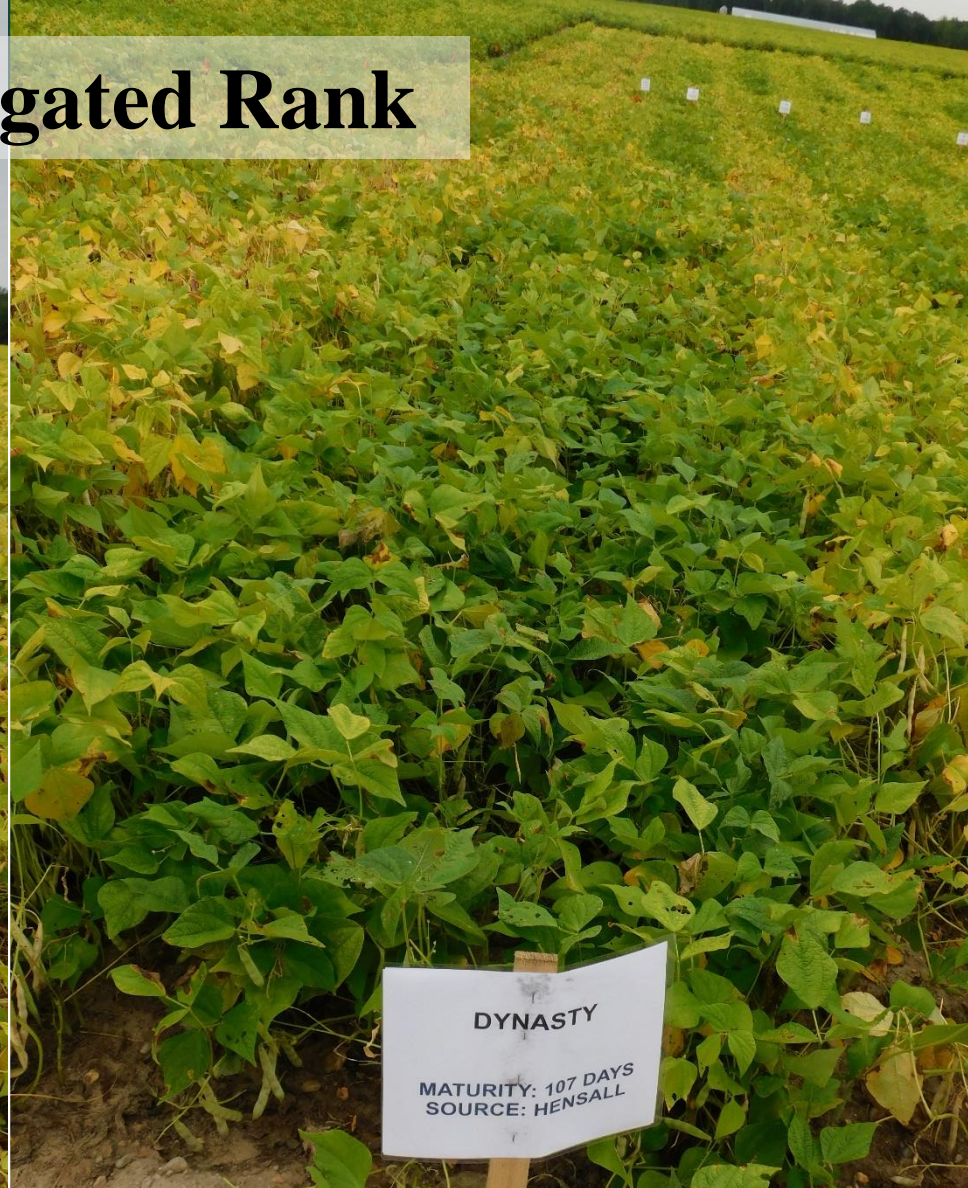


*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$

3-Year Irrigated Rank



RED ROVER
RANK: 2

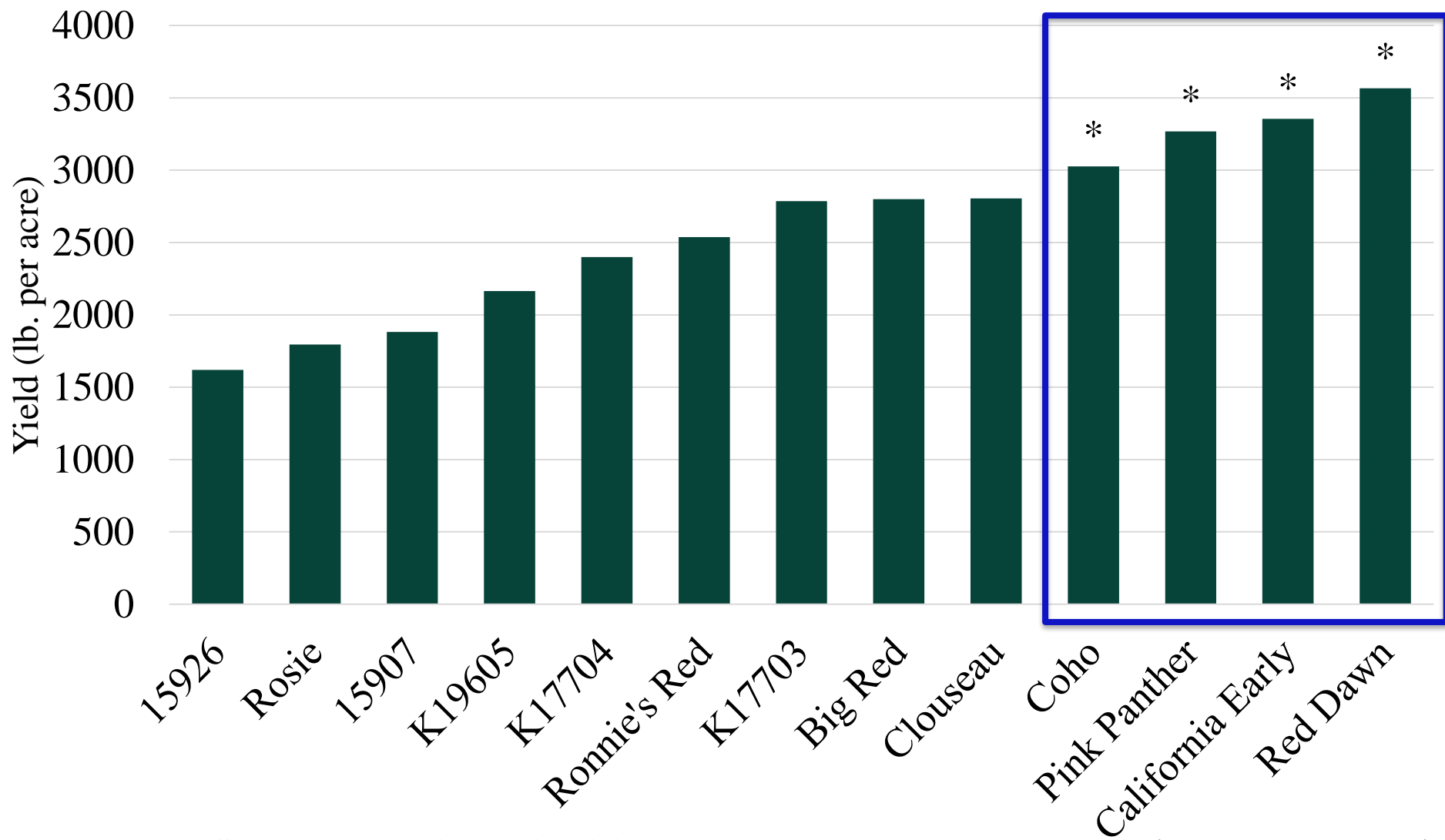


DYNASTY
RANK: 1

Large Seeded Beans

Light Red Kidney- One Year Irrigated

 = 90th percentile



*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$

3-Year Irrigated Rank

CLOUSEAU
MATURITY: 94 DAYS
SOURCE: SEMINIS

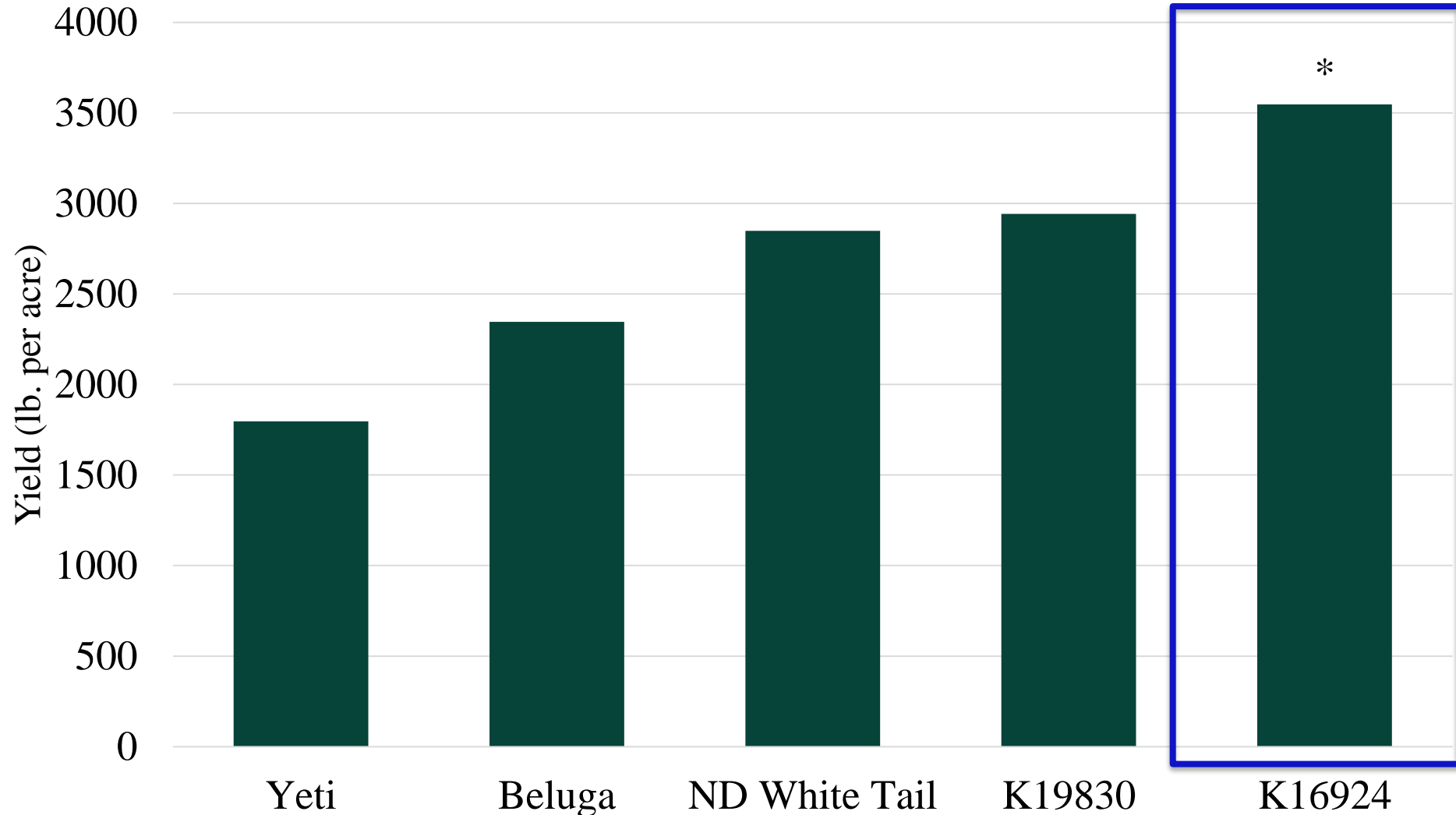
CLOUSEAU
RANK: 2

RED DAWN
RANK: 1

Large Seeded Beans

White Kidney- One Year Irrigated

 = 90th percentile



*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$

1-Year Irrigated Rank

BELUGA
MATURITY: 106 DAYS
SOURCE: MSU

WHITE TAIL
MATURITY:
SOURCE: NDSU

BELUGA
RANK: 2

WHITE TAIL
RANK: 1

Nitrogen Rate and Timing

Etna Cranberry Beans

- 4 Treatments
- 4 Replications

Treatment	Nitrogen applied at planting	Nitrogen applied at side-dress
1	0	0
2	0	20
3	45	20
4	45	60



**At Planting:
0 LB/A**

**Side-Dress:
0 LB/A**

**At Planting:
0 LB/A**

**Side-Dress:
20 LB/A**

**At Planting:
45 LB/A**
**Side-Dress:
20 LB/A**

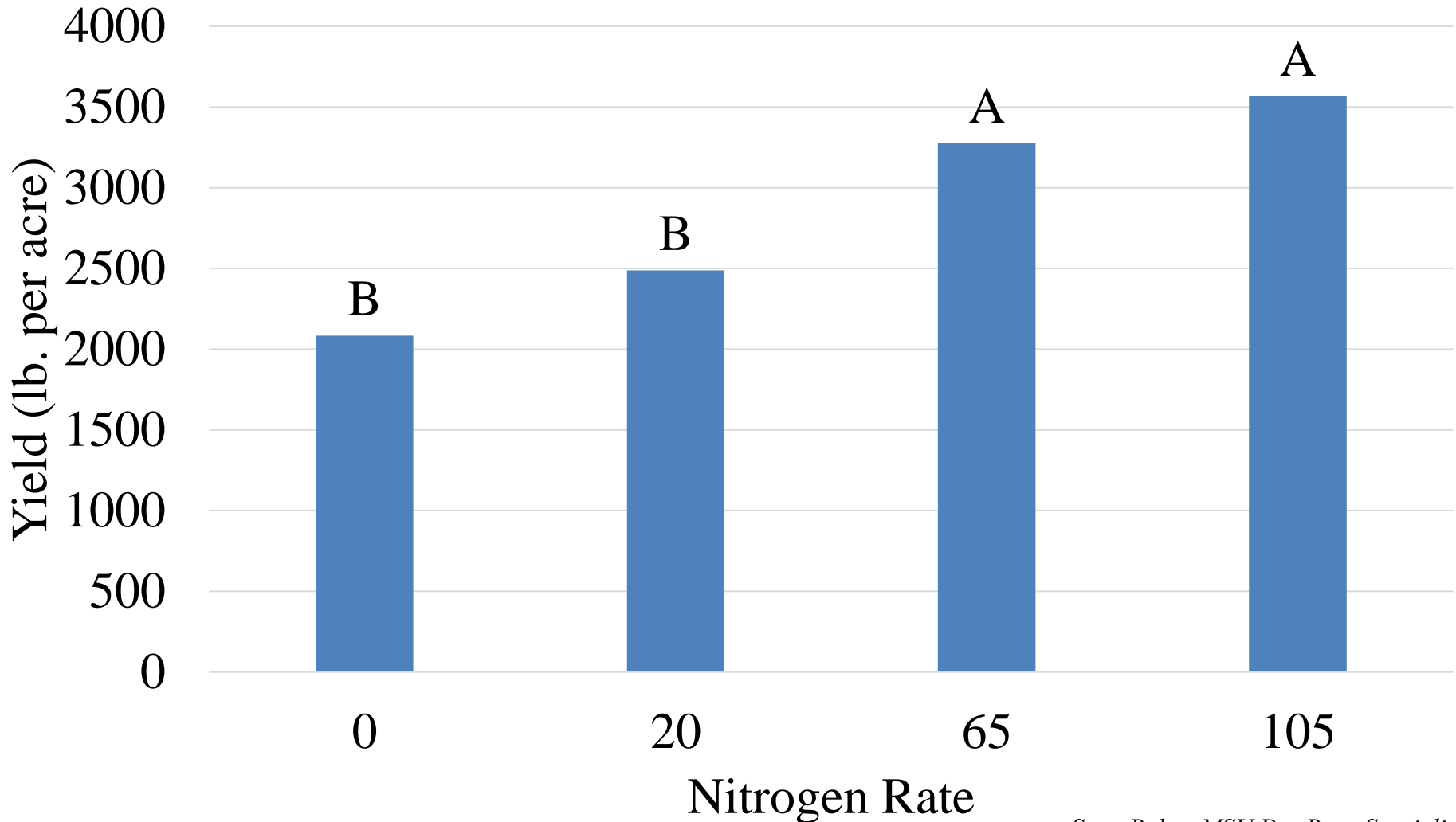
**At Planting:
45 LE/A**
**Side-Dress:
60 LE/A**

At Planting:
45 LB/A

At Planting:
45 LE/A

Nitrogen Rate and Timing

Etna Cranberry Beans



*Means followed by the same letter not statistically different from each other $P \leq 0.05$

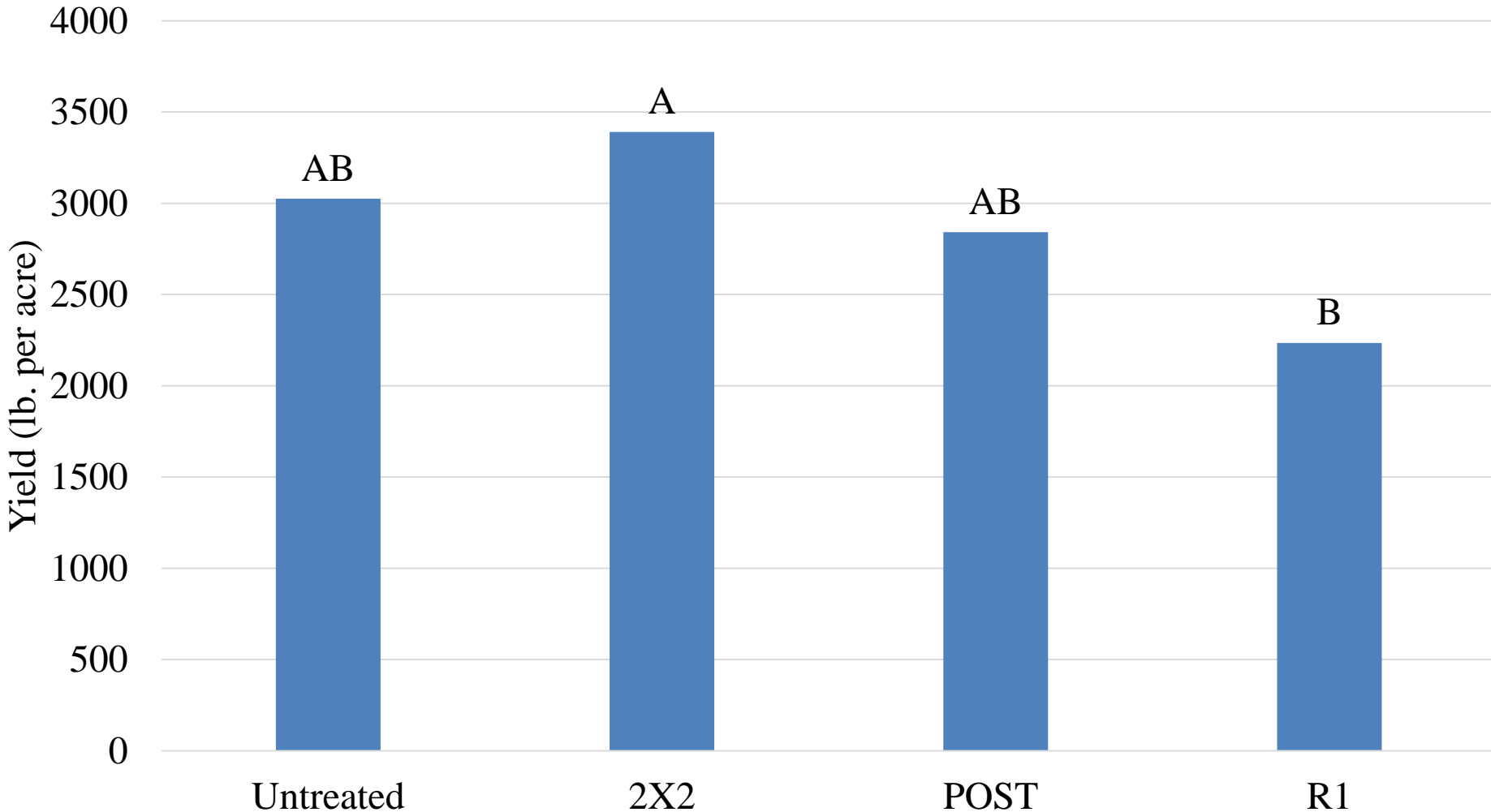
Micronutrient Application Method

Etna Cranberry Beans

Treatment	Method	Product
1	Untreated	No Micros
2	2x2	32 oz. Zn (6%) + 32 oz. Mn (5%)
3	POST	-
4	R1	-

Micronutrient Application Method

Etna Cranberry Beans



*Yield not statistically different than the highest yielding variety within column $P \leq 0.05$

Scott Bales- MSU Dry Bean Specialist

Questions?

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Pawlowski Farms
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2021 MDARD Specialty Crop Block Grant Research

- Optimization of Fertilizer Rate Recommendations for Michigan Dry Bean Growers: Strengthening Economic, and Environmental Sustainability
 - \$99,998
- On-Farm research trials
 - Fertility related strip trials
 - Small plot bio-fortification (value added)
- Research center based trials
 - Breeding for improved N-fixation
 - Cover crop use for Nitrate management and weed control

Thank you!

Schindler Farms

Lutz Farms

Pawlowski Farms

Jaquays Farms

Bednarski Farms

LAAKE & Ewald

Aldrich Farms

Farms

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