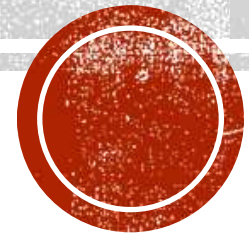


CANOLA: ARE SAFE RATES OF P CHANGING?



Jessica Weber
General Manager,
WARC
Scott, SK

CURRENT RECOMMENDATIONS

Safe Rates of P₂O₅

- 17 to 22 kg P₂O₅ / ha
- 28 kg P₂O₅ / ha under good moisture

Removal Rates

- 1-1.2 kg P₂O₅ / bu > Safe Rate

Safe rates of SO₄- S

- 11 kg S / ha

Typical Recommendation

- 15- 30 kg S / ha

Soil Texture	1 in. spread ¹ (disk or knife) ²			2 in. spread ¹ (spoon or hoe)			3 in. spread ¹ (sweep)		
	Row Spacing (in.)								
	6	9	12	6	9	12	6	9	12
	SBU ³								
	17%	11%	8%	33%	22%	17%	50%	33%	25%
Light (sandy loam)	0	0	0	10	0	0	20	10	0
Medium (loam to clay loam)	0	0	0	20	10	0	30	20	10
Heavy (clay to heavy clay)	10	0	0	30	20	10	40	30	20



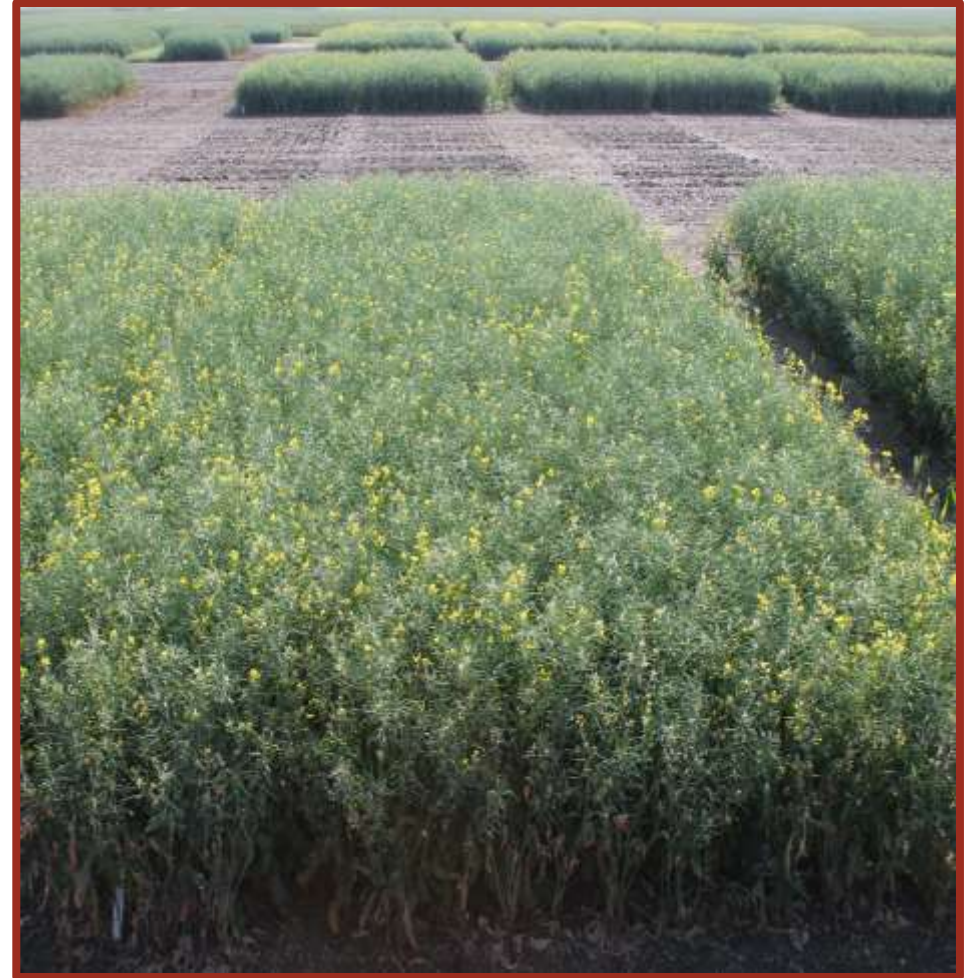
OBJECTIVES

- Are current P fertilizer recommendations adequate for high yielding cultivars?
- Does all fertilizer P need to be seed placed or is side banding equally effective?
- Are current recommendations regarding safe rates of P and S suitable for typical knife or hoe openers in use today?



EXPERIMENTAL DESIGN

- 3 Sites: Scott, Indian Head, & Melfort
- Trial Period: **2016, 2017, 2018**
- RCBD 4 Replicates
- 2-Way Factorial
 - Rate: 0, 20, 40, 60, 80 kg/ha P₂O₅ & 15 S
 - Placement: Sideband (SB) & Seed-Placed (SP)
- Data Collection
 - Plant Density: 2,4,6 WAP
 - Biomass: 6 WAP
 - Days to Maturity: 60% SCC
 - Yield
 - Green Seed
 - TKW



TREATMENT APPLICATION

Treatment #	kg/ha P ₂ O ₅	Placement
1	0	SP
2	20	SP
3	40	SP
4	60	SP
5	80	SP
6	0	SB
7	20	SB
8	40	SB
9	60	SB
10	80	SB
11	0 & 15S	SP
12	20 & 15S	SP
13	40 & 15S	SP
14	60 & 15S	SP
15	80 & 15S	SP



SITE INFORMATION

Scott

- SBU 10%
- Loam

SOIL TEST NUTRIENT LEVELS

Depth (inches)	NO ₃ -N	P	K	SO ₄ -S
0-6	13	>30	261	11
6-12	6			2
12-24	5	“low”		2

Indian Head

- SBU 6%
- Clay Loam

SOIL TEST NUTRIENT LEVELS

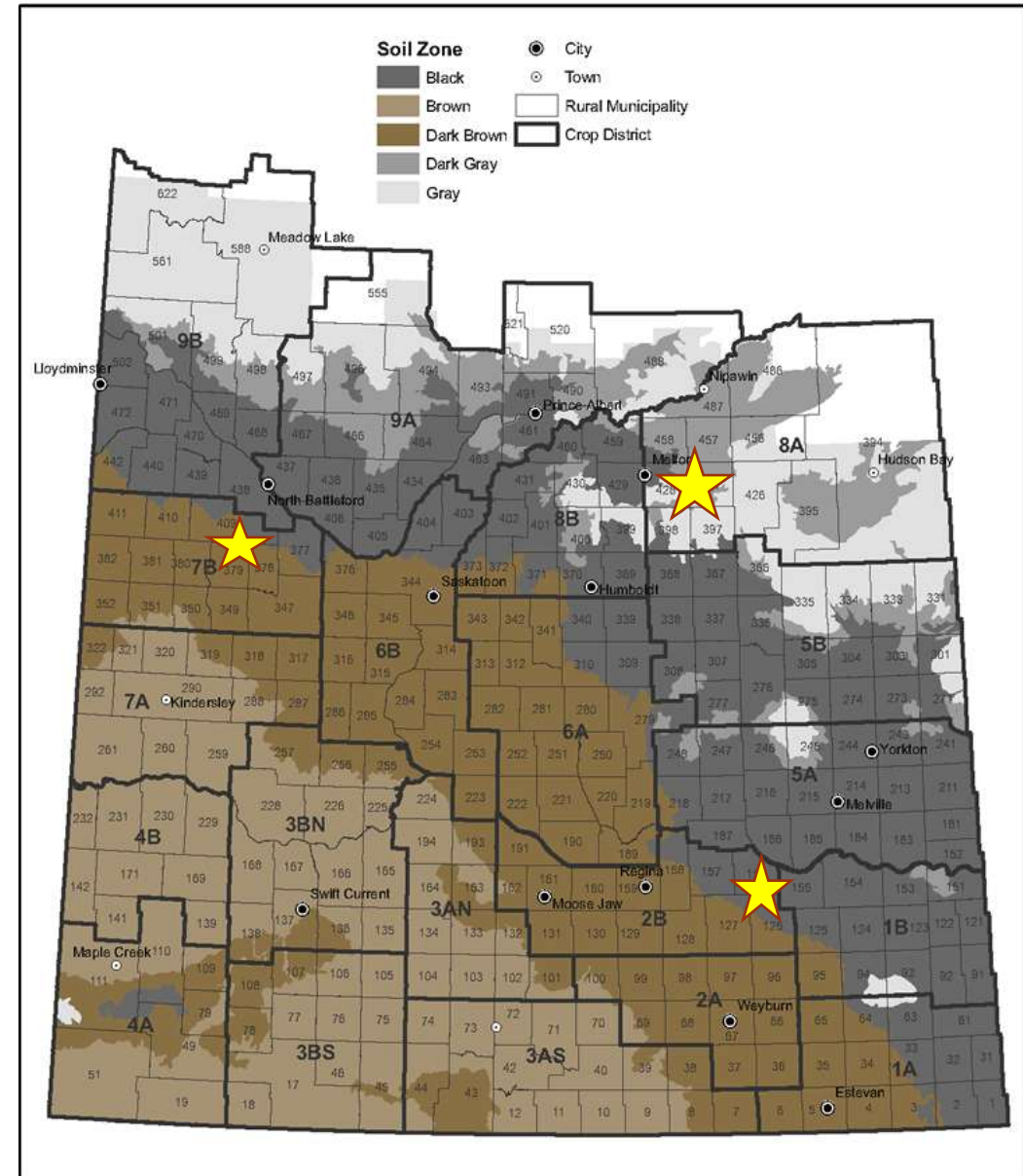
Depth (inches)	NO ₃ -N	P	K	SO ₄ -S
0-6	10	6	>540	9
6-24	11	“very low”		19

Melfort

- SBU 8%
- Clay Loam

SOIL TEST NUTRIENT LEVELS

Depth (inches)	NO ₃ -N	P	K	SO ₄ -S
0-6	39	22	700	10
0-12	68	“low”		15

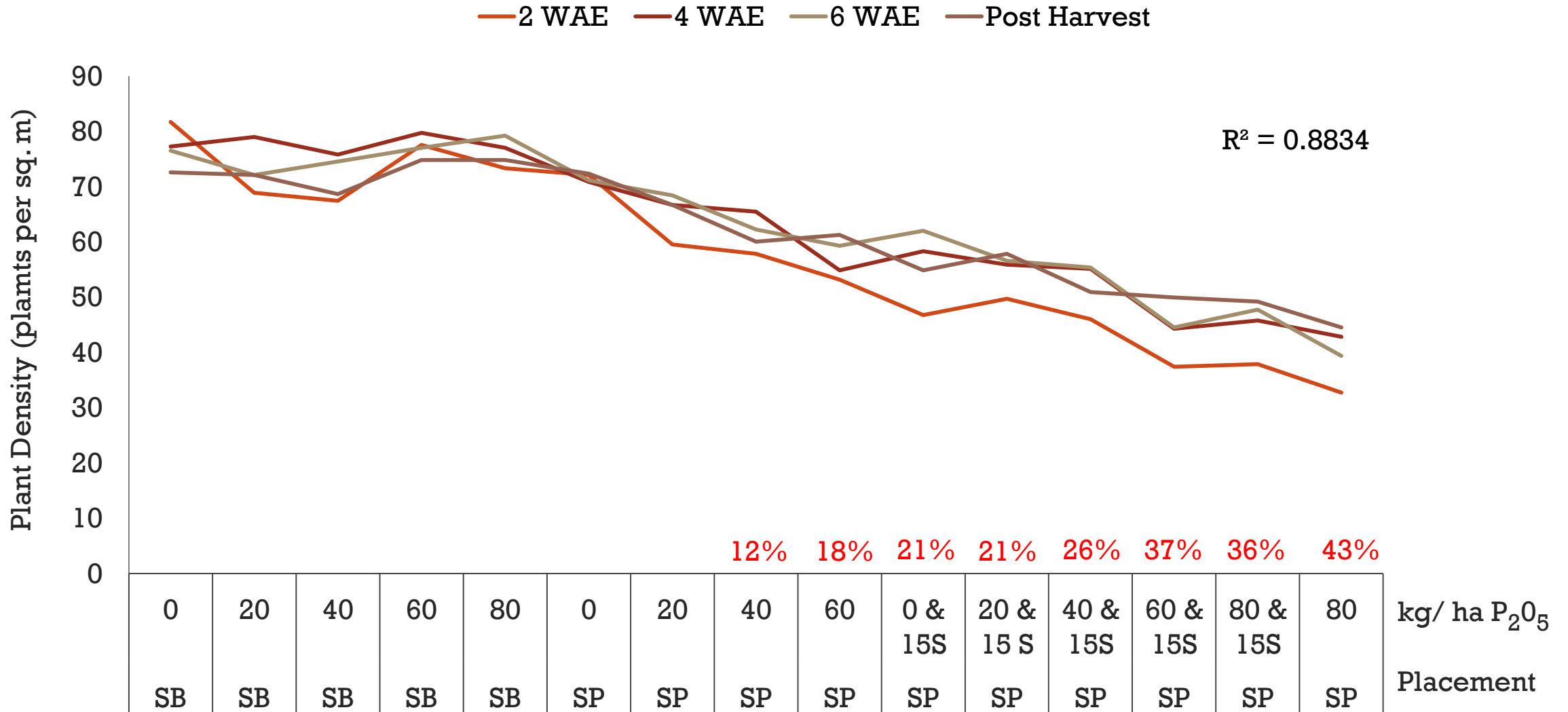


PRELIMINARY RESULTS: SCOTT

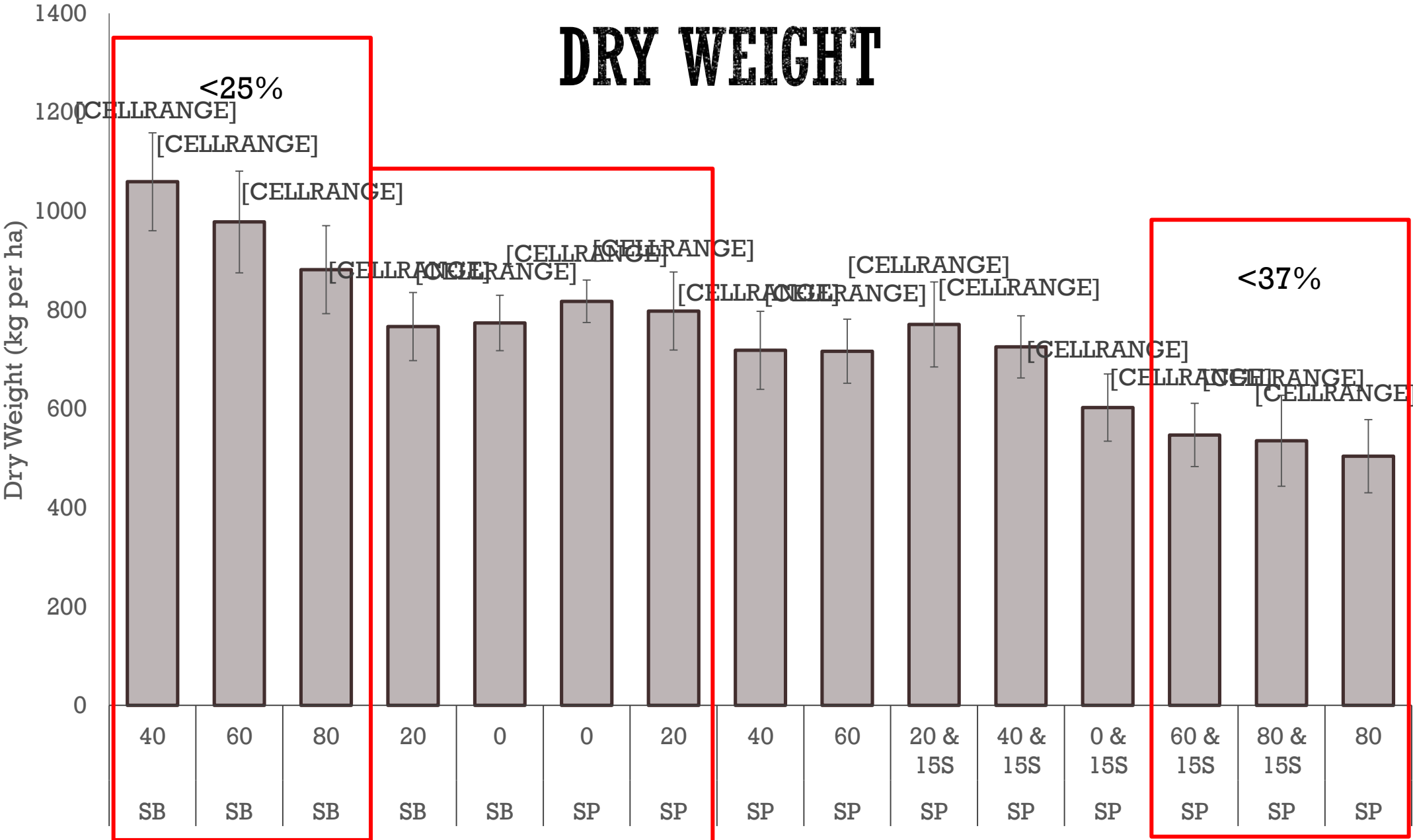
	Plant Density (plants/m ²)	Dry Weight (kg/ha)	P Concen. (%)	DTM -	Yield (kg/ha)	Green Seed (%)	TKW (g/1000s)
Fertilizer Rate (Rt)	<0.0001	0.0238	<0.0001	<0.0001	.6889	0.9998	0.6377
Placement (Pc)	0.6762	0.2415	0.7943	0.8050	0.2086	0.7172	0.9483
Rt * Pc	<0.0001	0.004	0.1518	0.3457	0.5574	0.3566	0.7934



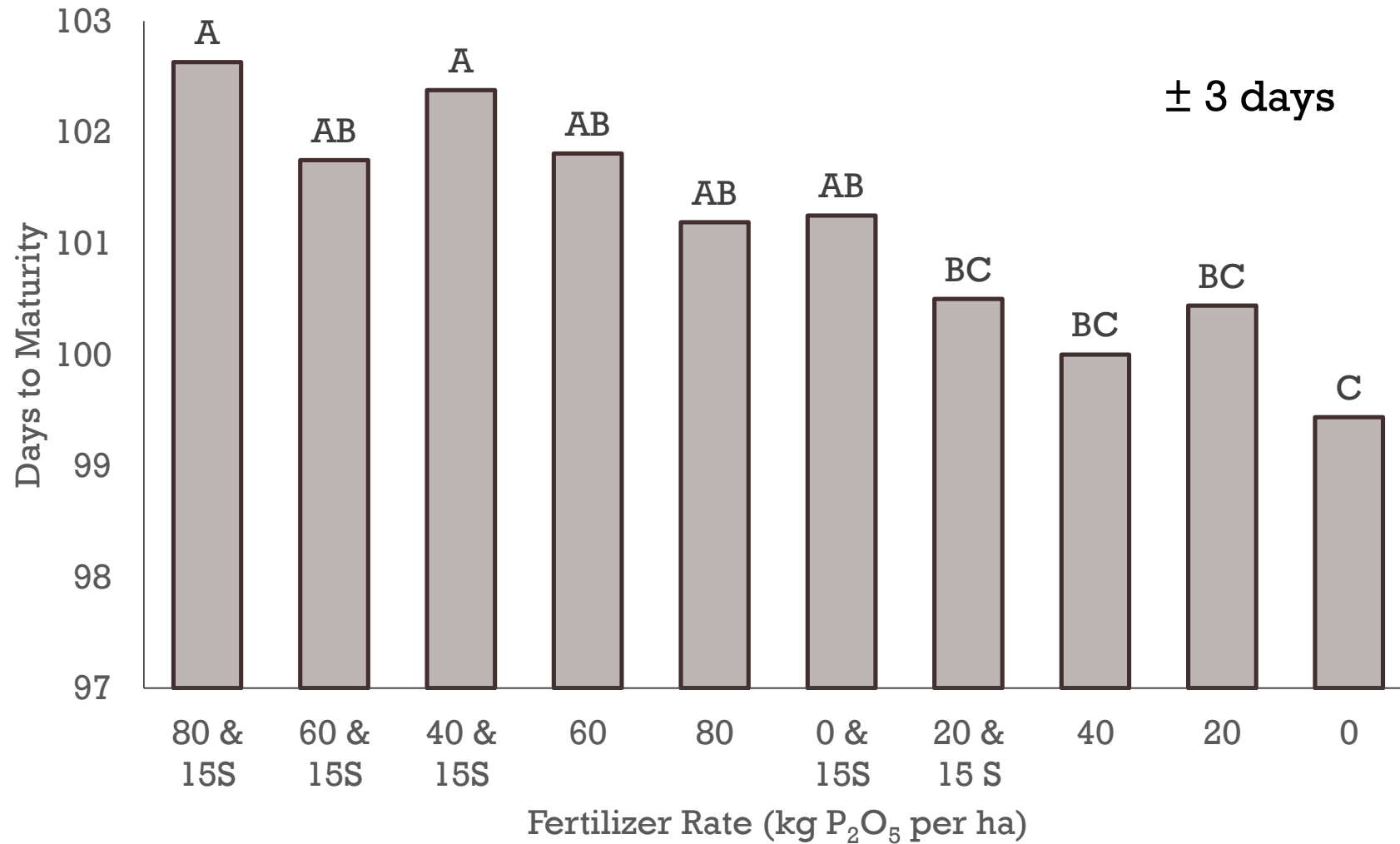
PLANT DENSITY



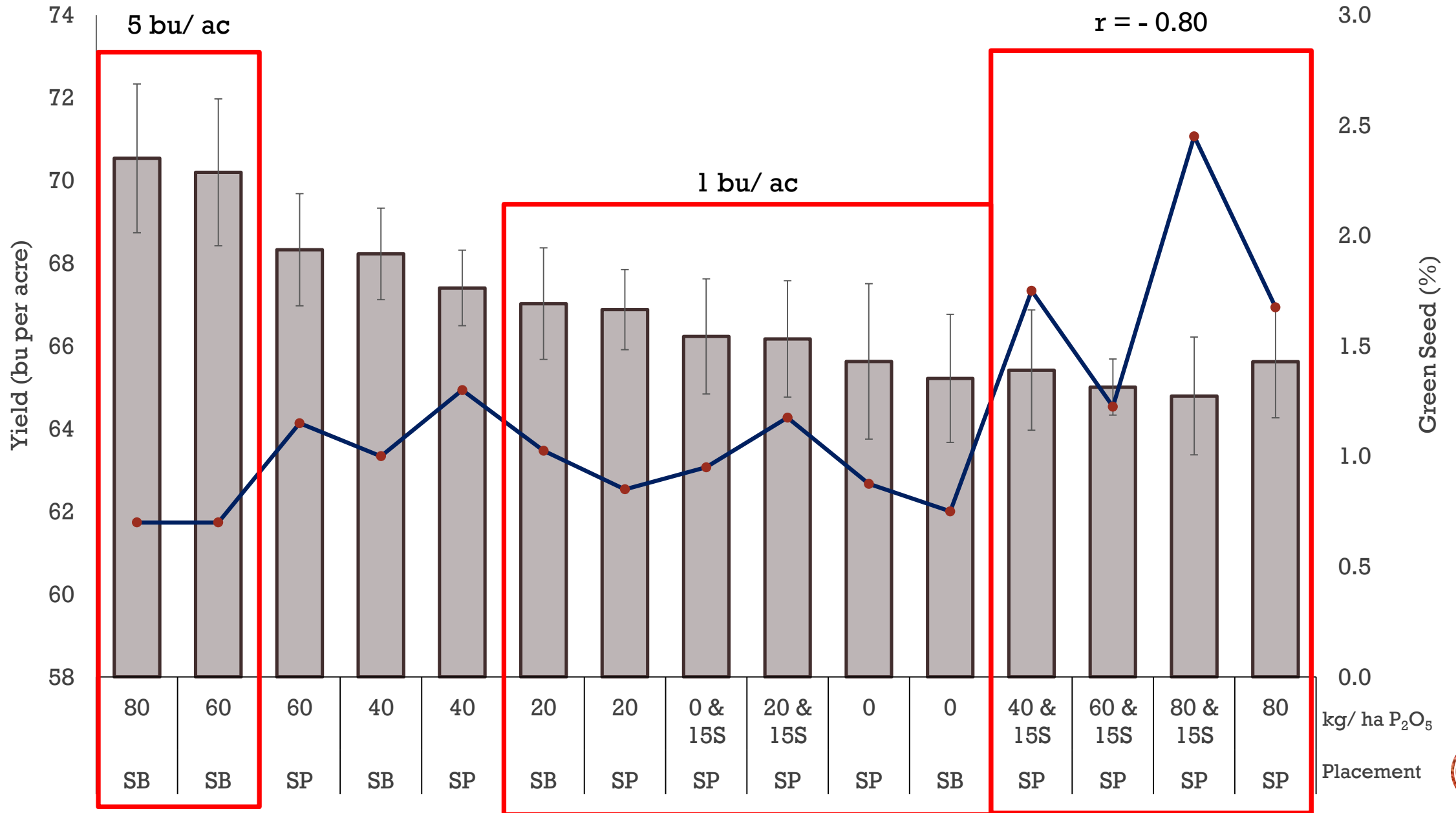
DRY WEIGHT



DAYS TO MATURITY



SEED YIELD & GREEN SEED



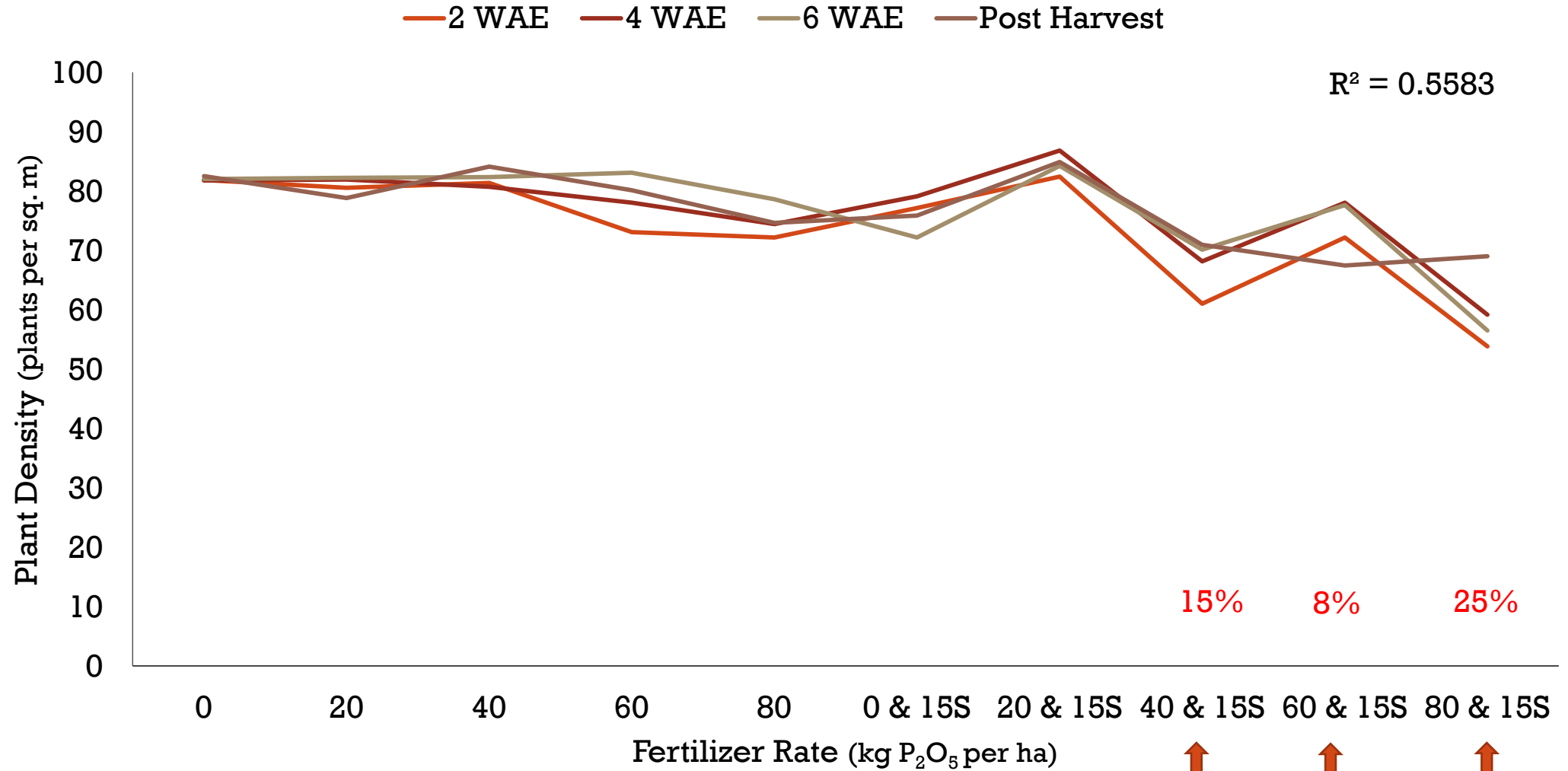
PRELIMINARY RESULTS: INDIAN HEAD

	Plant Density (plants/m ²)	Dry Weight (kg/ha)	P Concen. (%)	DTM -	Yield (kg/ha)	Green Seed* (%)	TKW* (g/1000s)
Fertilizer Rate (Rt)	0.0026	0.1937	0.0019	0.1189	0.4788	0.331	0.202
Placement (Pc)	0.7697	0.8954	0.9237	0.6638	0.9084	0.392	0.310
Rt * Pc	0.3572	0.3092	0.8072	0.3661	0.7712	0.310	0.838

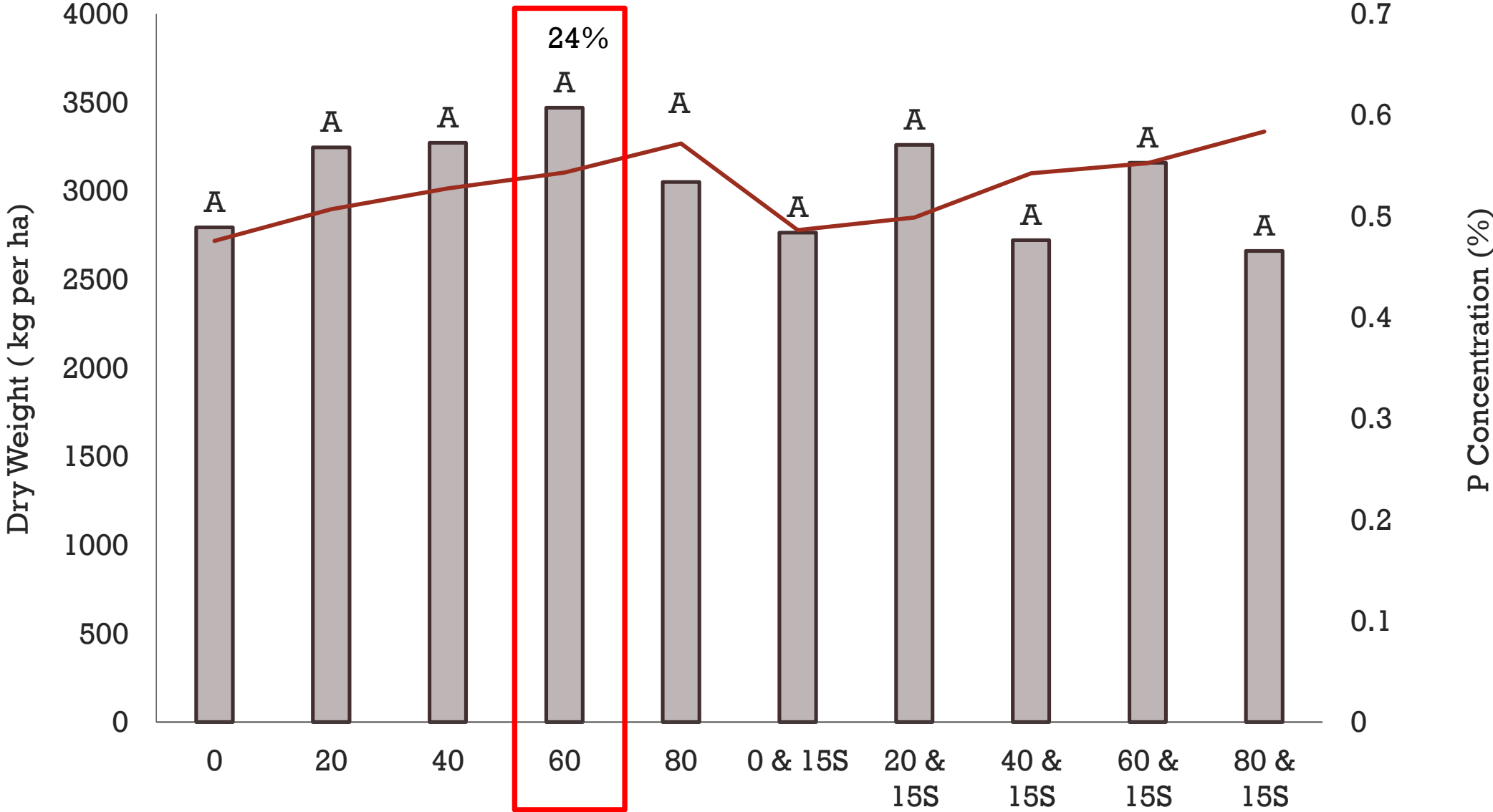
* 2016 data only



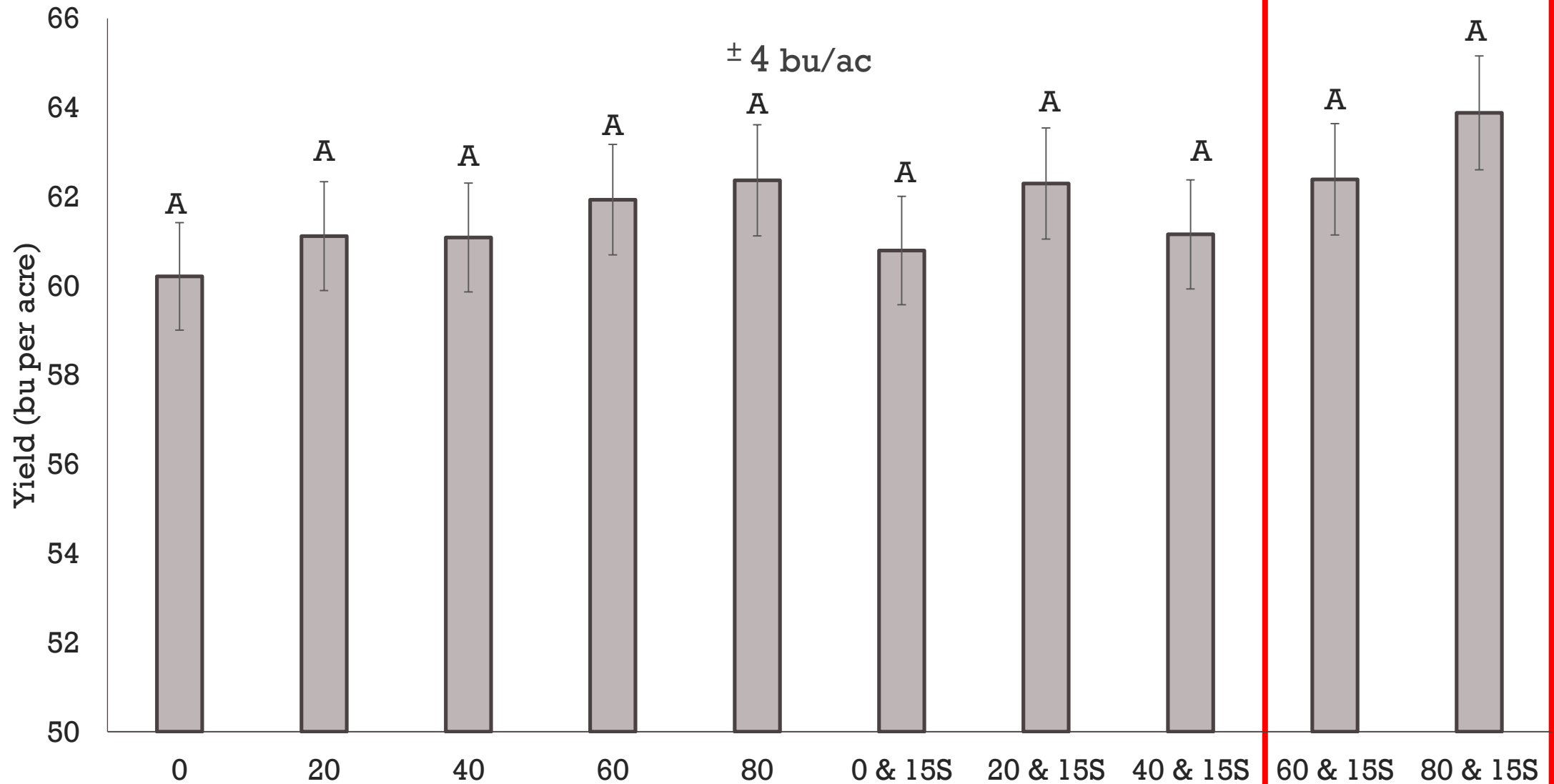
PLANT DENSITY



DRY WEIGHT



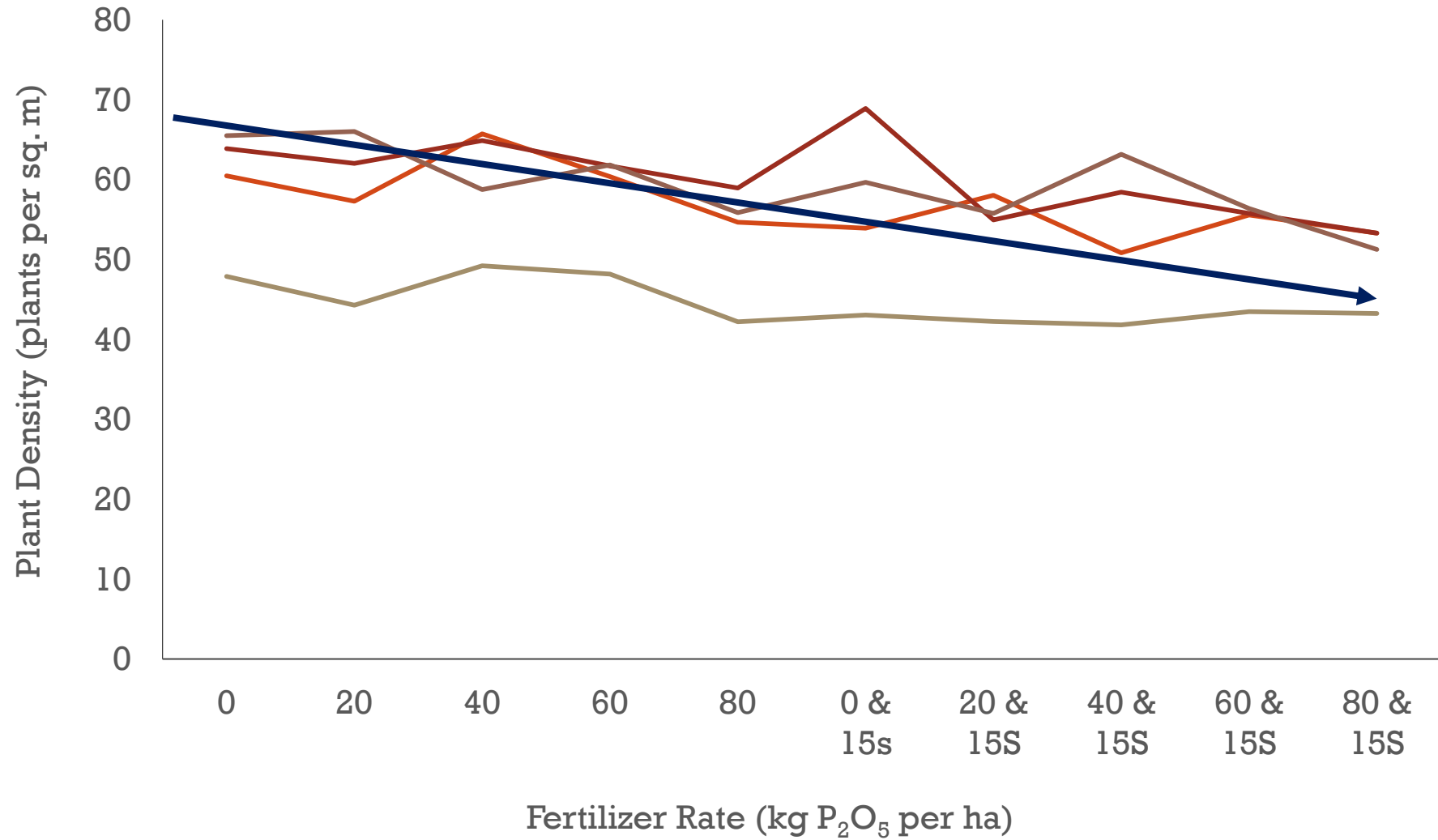
SEED YIELD



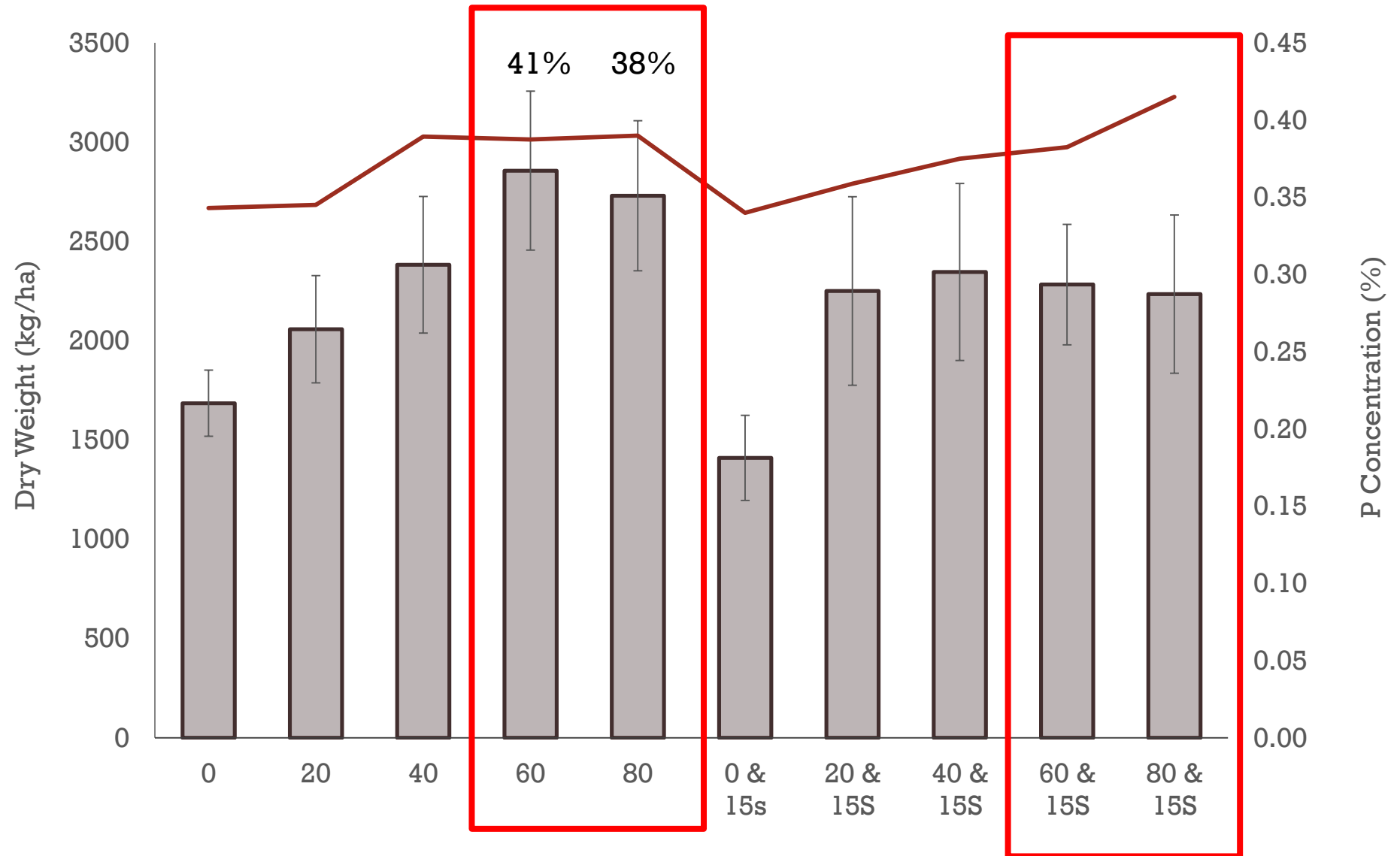
PRELIMINARY RESULTS: MELFORT



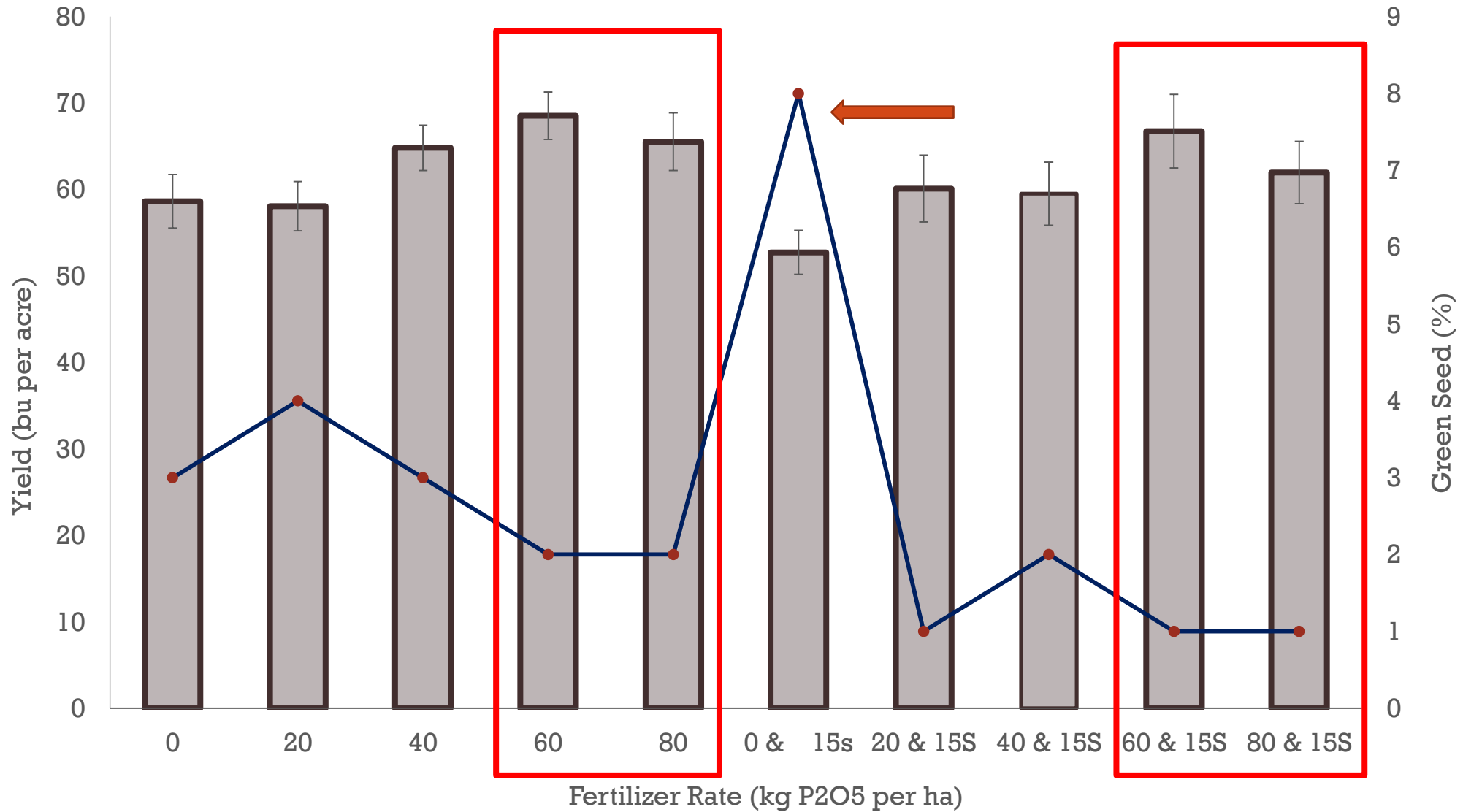
PLANT DENSITY



DRY WEIGHT & P CONCENTRATION



SEED YIELD & GREEN SEED



IMPLICATIONS

Effects of P & S were Site Dependent

- **Scott:**
 - Placement & Rate Interaction
 - Side-banding higher rates effective
 - >40 kg/ ha
 - S above recommended rate negative effects
- **Indian Head**
 - Rate Effect
 - Early season effect
 - Yield & GS unaffected : 4 bu/ac difference
- **Melfort**
 - Rate Effect
 - > 40 P₂O₅ greatest yield
 - S applications < P₂O₅ alone



FUTURE RESEARCH

- Are current P fertilizer recommendations adequate for high yielding cultivars?
 - >40 kg/ ha P_2O_5
- Does all fertilizer P need to be seed placed or is side banding equally effective?
 - Location dependent? Scott $>$ Melfort $>$ Indian Head

Factors to Consider: **SOIL TEXTURE**
SOIL MOISTURE

- Are current recommendations regarding safe rates of P and S suitable for typical knife or hoe openers in use today?
 - 17 to 22 kg P_2O_5 / ha VS. >40 kg P_2O_5 / ha



ACKNOWLEDGEMENTS



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

