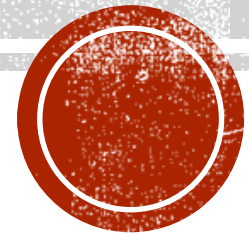


# CANOLA: ARE SAFE RATES OF P CHANGING?



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# CURRENT RECOMMENDATIONS

## Safe Rates of P<sub>2</sub>O<sub>5</sub>

- 17 to 22 kg P<sub>2</sub>O<sub>5</sub> / ha
- 28 kg P<sub>2</sub>O<sub>5</sub> / ha under good moisture

## Removal Rates

- 1-1.2 kg P<sub>2</sub>O<sub>5</sub> / bu > Safe Rate

## Safe rates of SO<sub>4</sub>- S

- 11 kg S / ha

## Typical Recommendation

- 15- 30 kg S / ha

Soil Texture	1 in. spread <sup>1</sup> (disk or knife) <sup>2</sup>			2 in. spread <sup>1</sup> (spoon or hoe)			3 in. spread <sup>1</sup> (sweep)		
	Row Spacing (in.)								
	6	9	12	6	9	12	6	9	12
	SBU <sup>3</sup>								
	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 P<sub>2</sub>O<sub>5</sub> & 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 <sub>2</sub> O <sub>5</sub>	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%
- Loom

### SOIL TEST NUTRIENT LEVELS

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

## Indian Head

- SBU 6%
- Clay Loom

### SOIL TEST NUTRIENT LEVELS

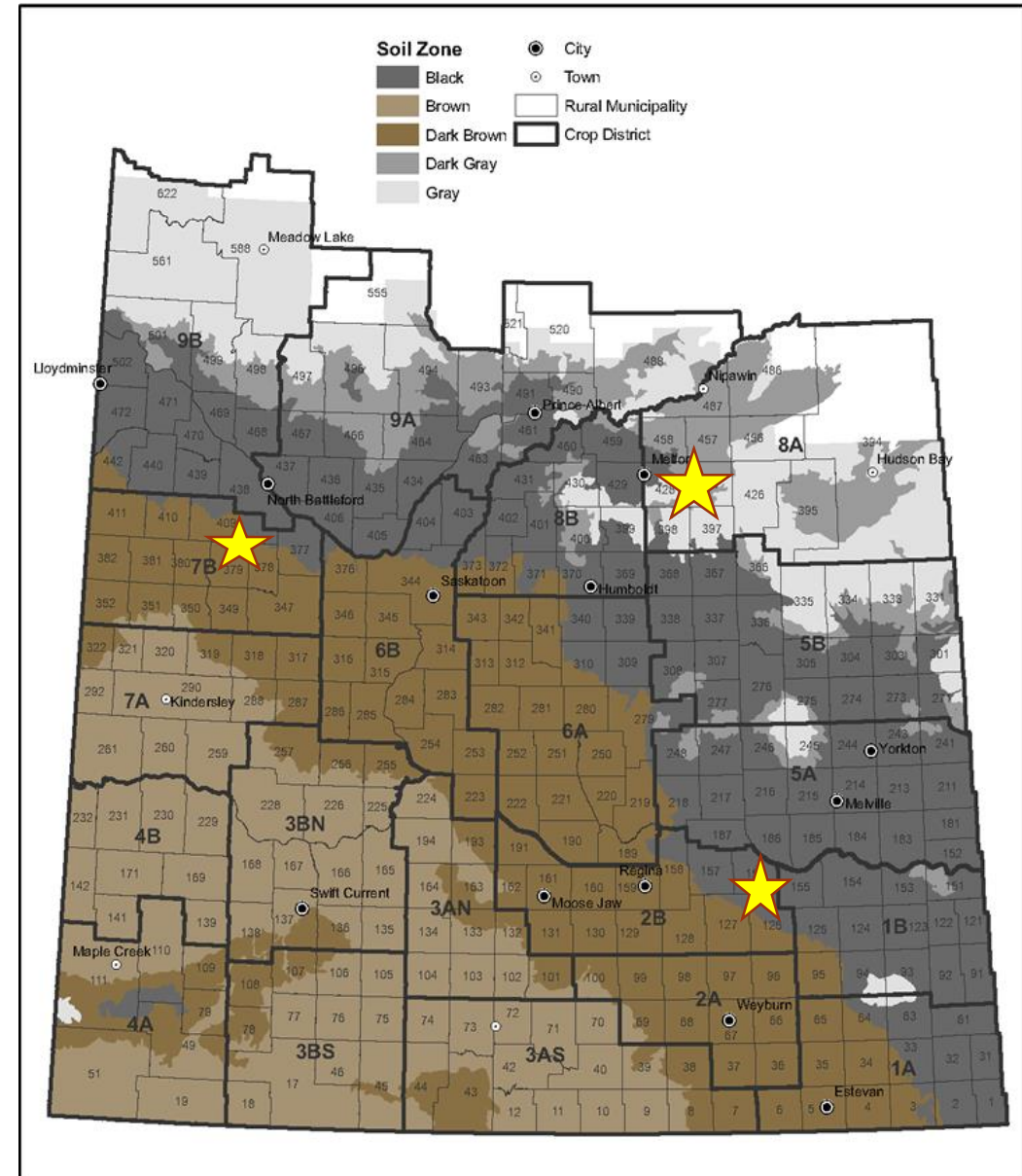
Depth (inches)	NO <sub>3</sub> -N	P	K	SO <sub>4</sub> -S
0-6	10	6	>540	9
6-24	11	"very low"		19

## Melfort

- SBU 8%
- Clay Loom

### SOIL TEST NUTRIENT LEVELS

Depth (inches)	NO <sub>3</sub> -N	P	K	SO <sub>4</sub> -S
0-6	39	22	700	10
0-12	68	"low"		15



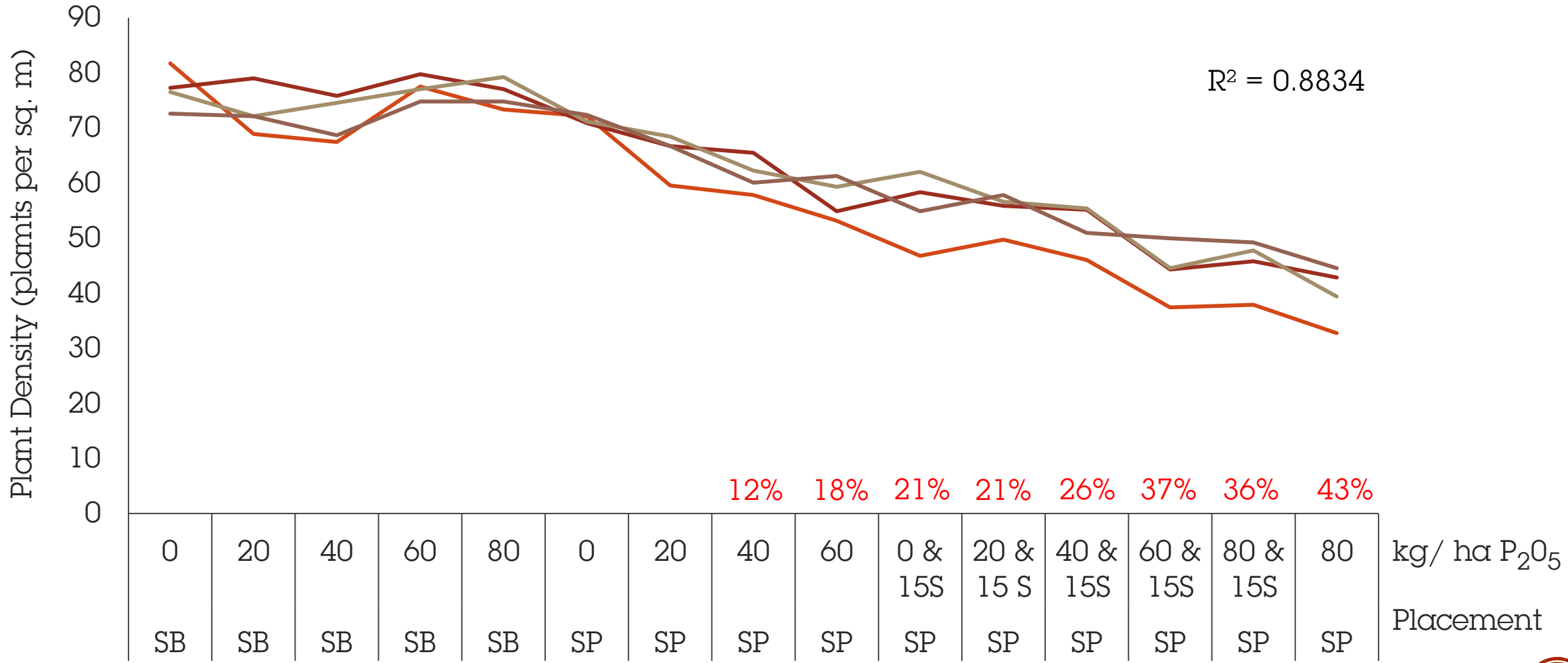
# PRELIMINARY RESULTS: SCOTT

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



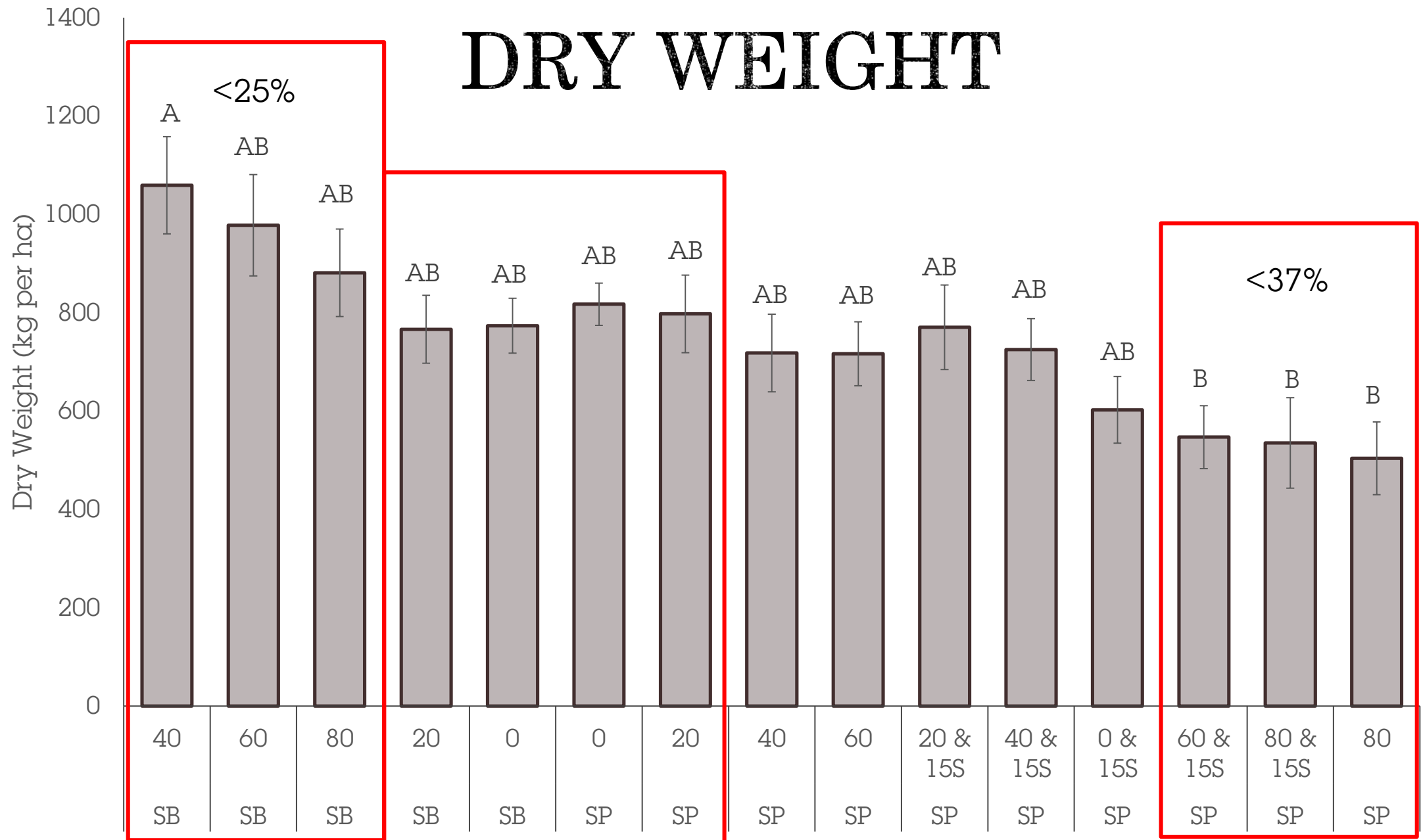
# PLANT DENSITY

— 2 WAE — 4 WAE — 6 WAE — Post Harvest

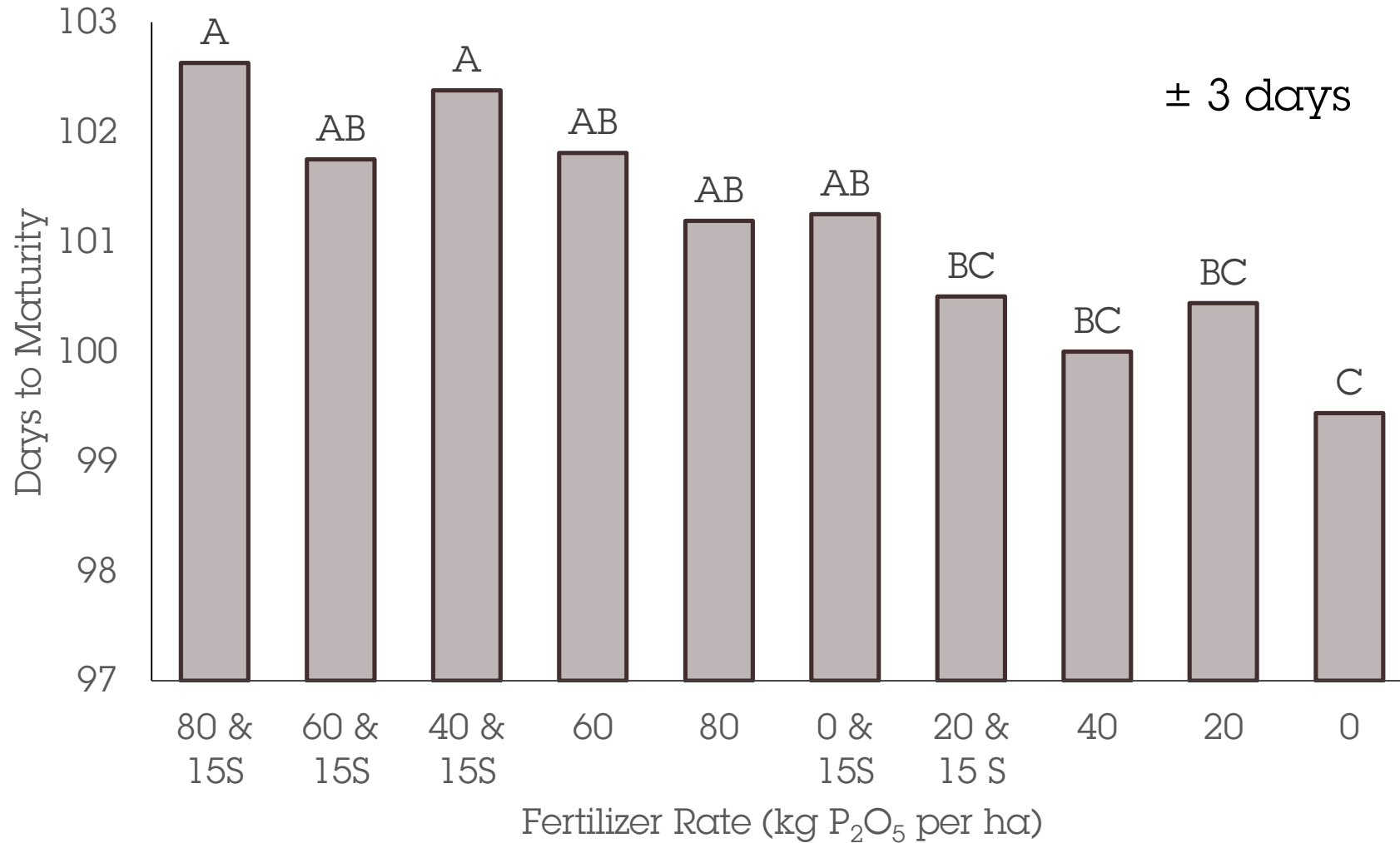




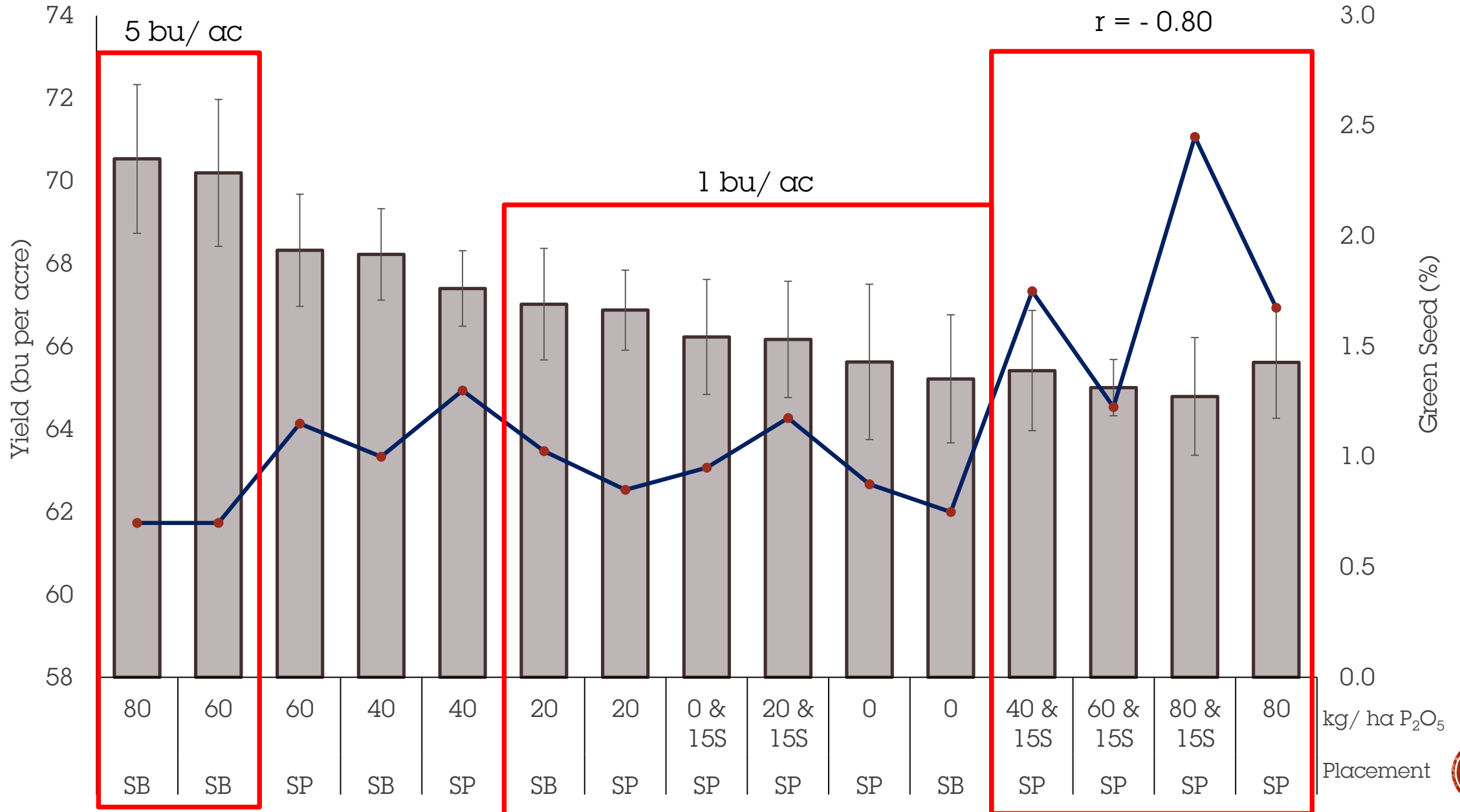
# DRY WEIGHT



# DAYS TO MATURITY



# SEED YIELD & GREEN SEED



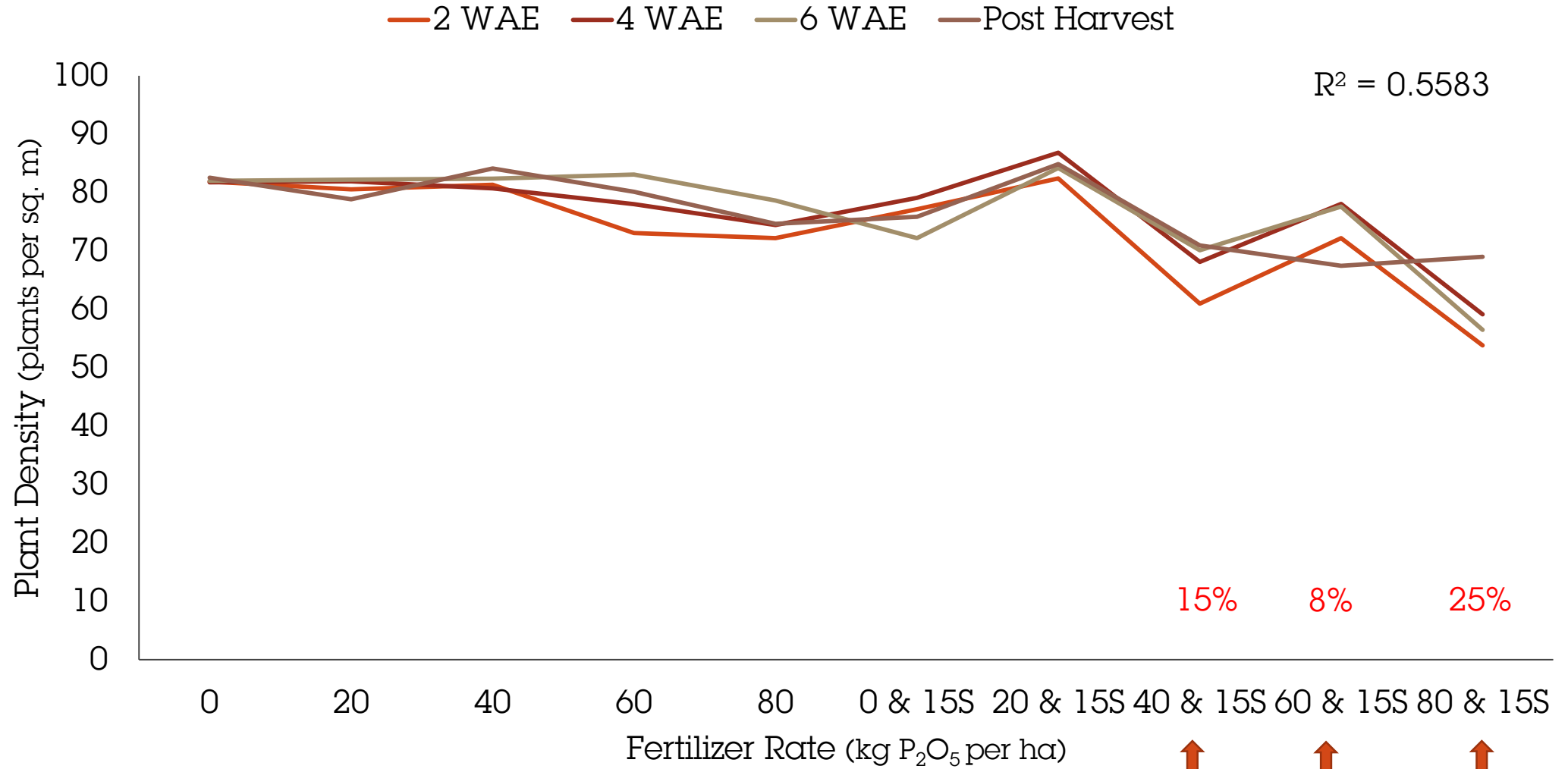
# PRELIMINARY RESULTS: INDIAN HEAD

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

\* 2016 data only

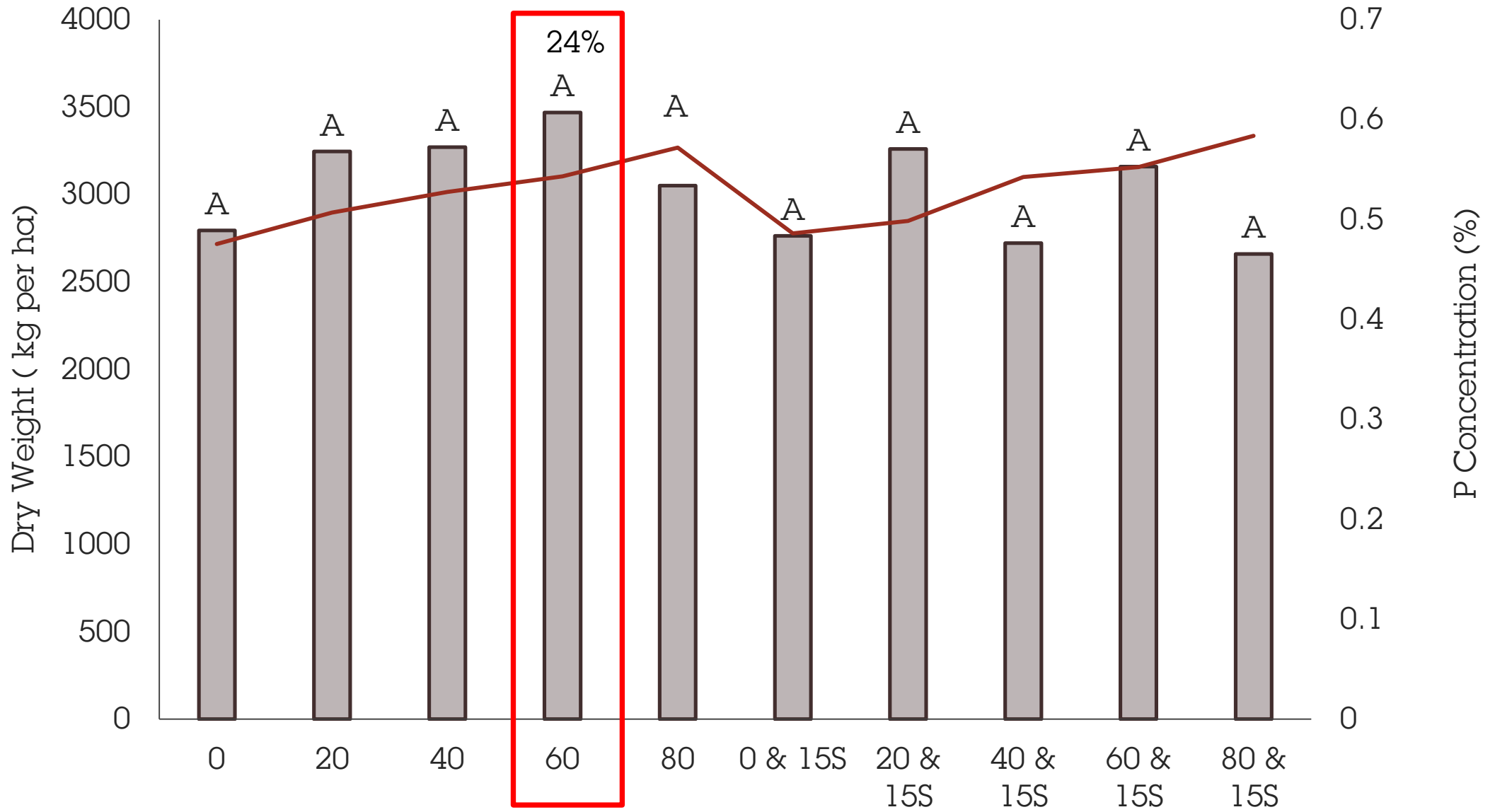


# PLANT DENSITY

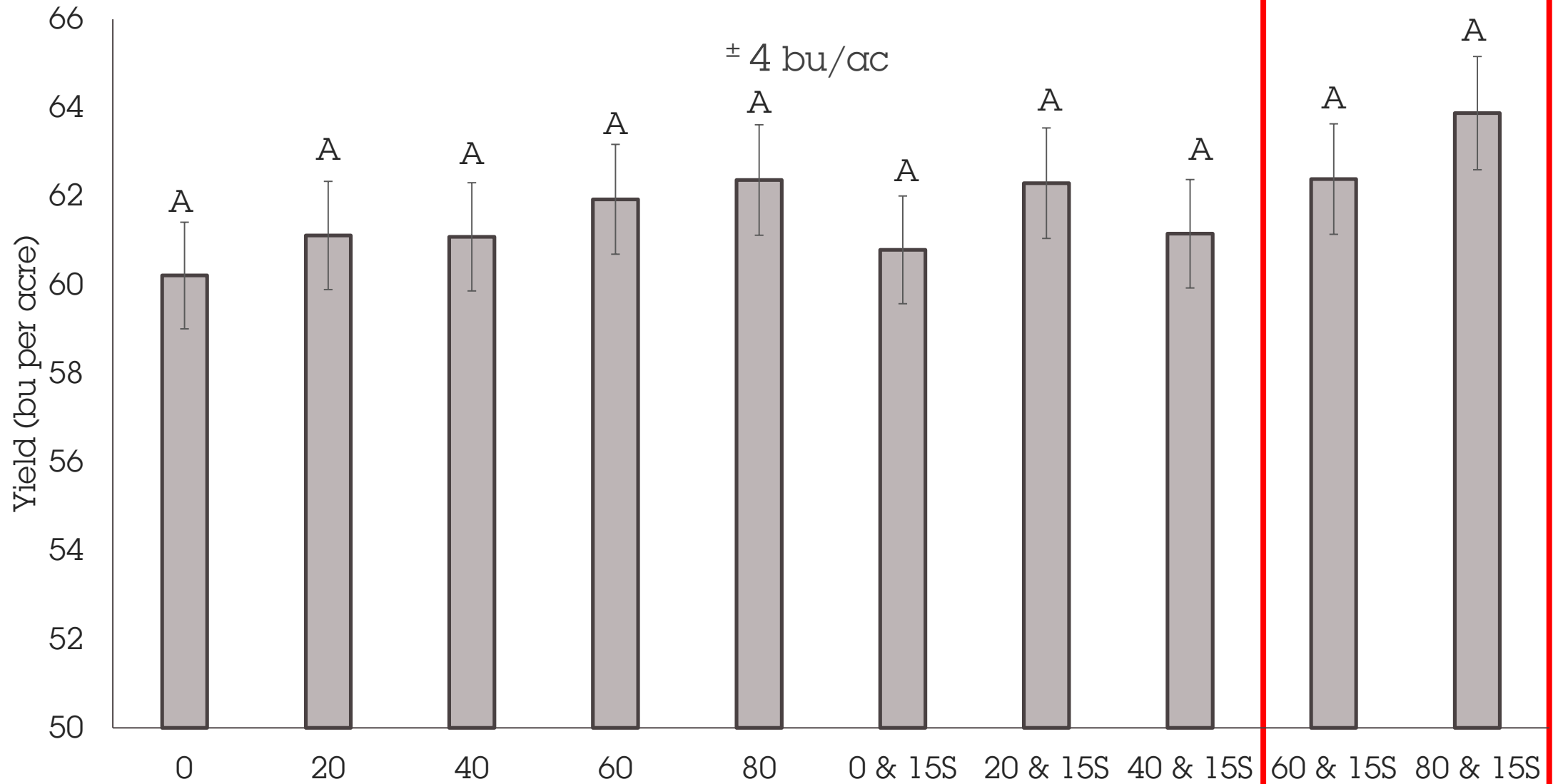




# DRY WEIGHT



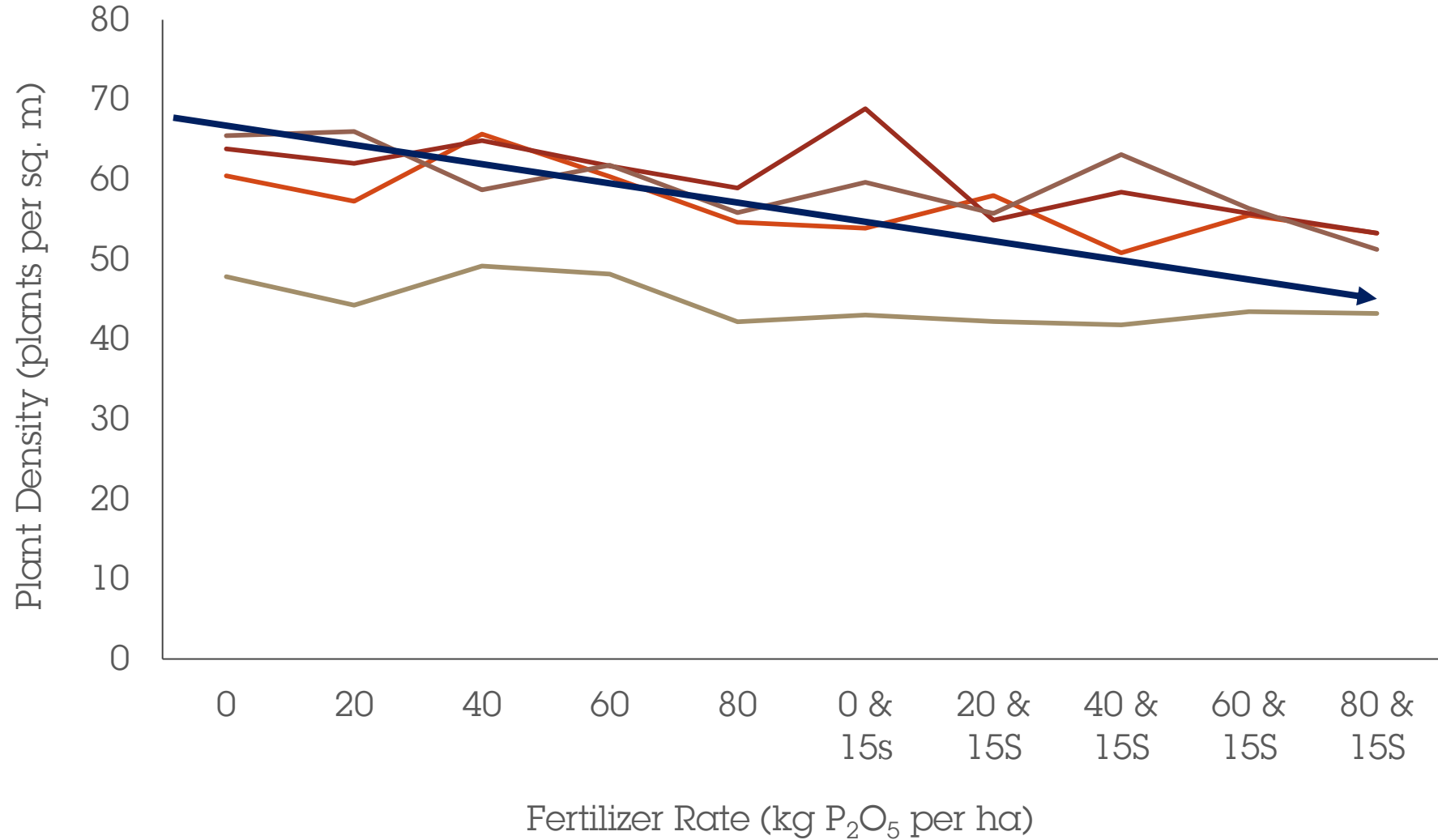
# SEED YIELD



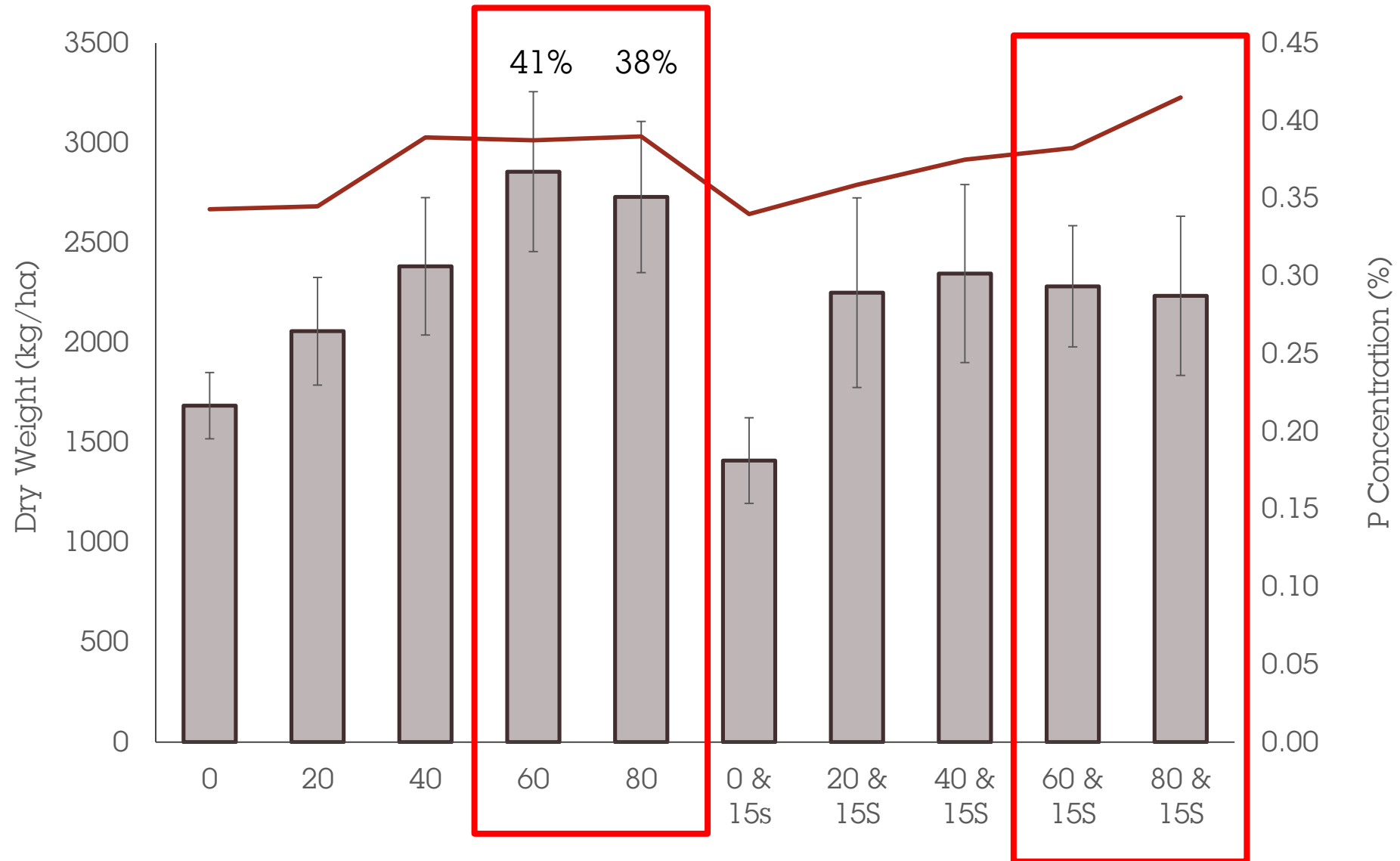
# PRELIMINARY RESULTS: MELFORT



# PLANT DENSITY

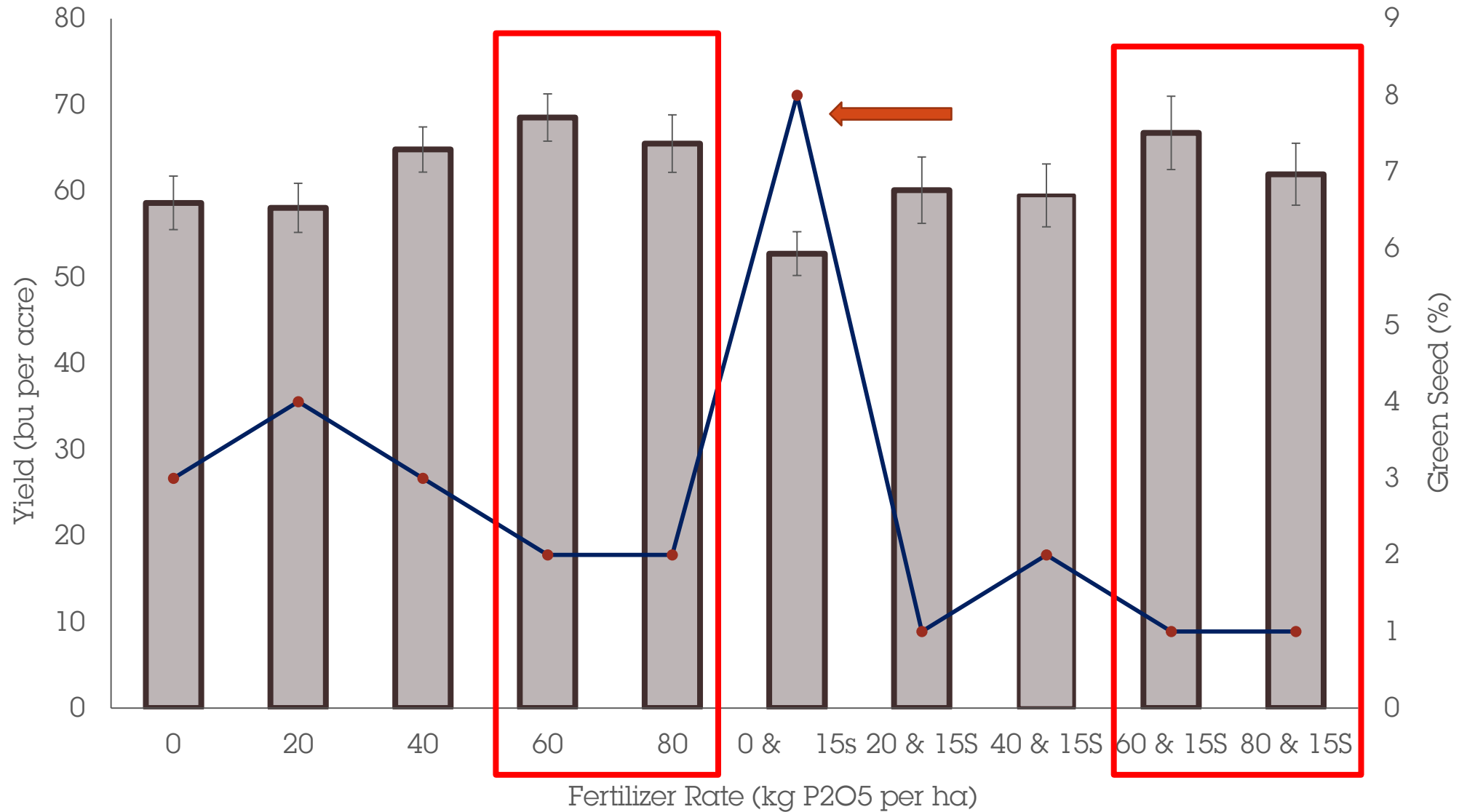


# DRY WEIGHT & P CONCENTRATION





# 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 P<sub>2</sub>O<sub>5</sub> greatest yield
    - S applications < P<sub>2</sub>O<sub>5</sub> alone



# FUTURE RESEARCH

- Are current P fertilizer recommendations adequate for high yielding cultivars?
  - $>40 \text{ kg/ ha P}_2\text{O}_5$
- 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?
  - $17 \text{ to } 22 \text{ kg P}_2\text{O}_5 / \text{ha VS. } >40 \text{ kg P}_2\text{O}_5 / \text{ha}$



# ACKNOWLEDGEMENTS



Agriculture and  
Agri-Food Canada

Agriculture et  
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