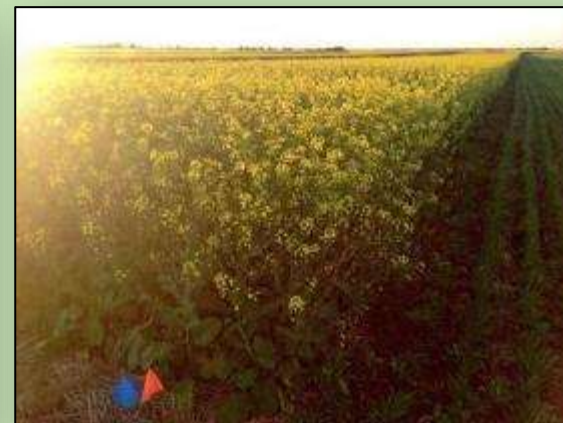


2016 IHARF AGRONOMY UPDATE

Chris Holzapfel, MSc, PAg



IHARF Funding Sources

- Grain revenues from approximately 1200 ac of owned & rented cropland comprise up to 50% of gross operating funds
- Additional revenues come from approximately 40-50 research & demo projects annually which are funded through government (provincial & federal), producer groups & private industry

Source	% of Outside Funding (Cash & In-Kind)							
	2010	2011	2012	2013	2014	2015	2016	AVG
Industry	49%	30%	36%	35%	32%	28%	27%	32%
Producer	36%	48%	45%	20%	26%	46%	41%	37%
Government	15%	22%	19%	45%	42%	26%	32%	31%

Hybrid vs Open Pollinated Fall Rye Agronomy

Indian Head 2014-15 & 2015-16 (ADOPT)



Hybrid vs Open Pollinated Fall Rye Response to Nitrogen Rates

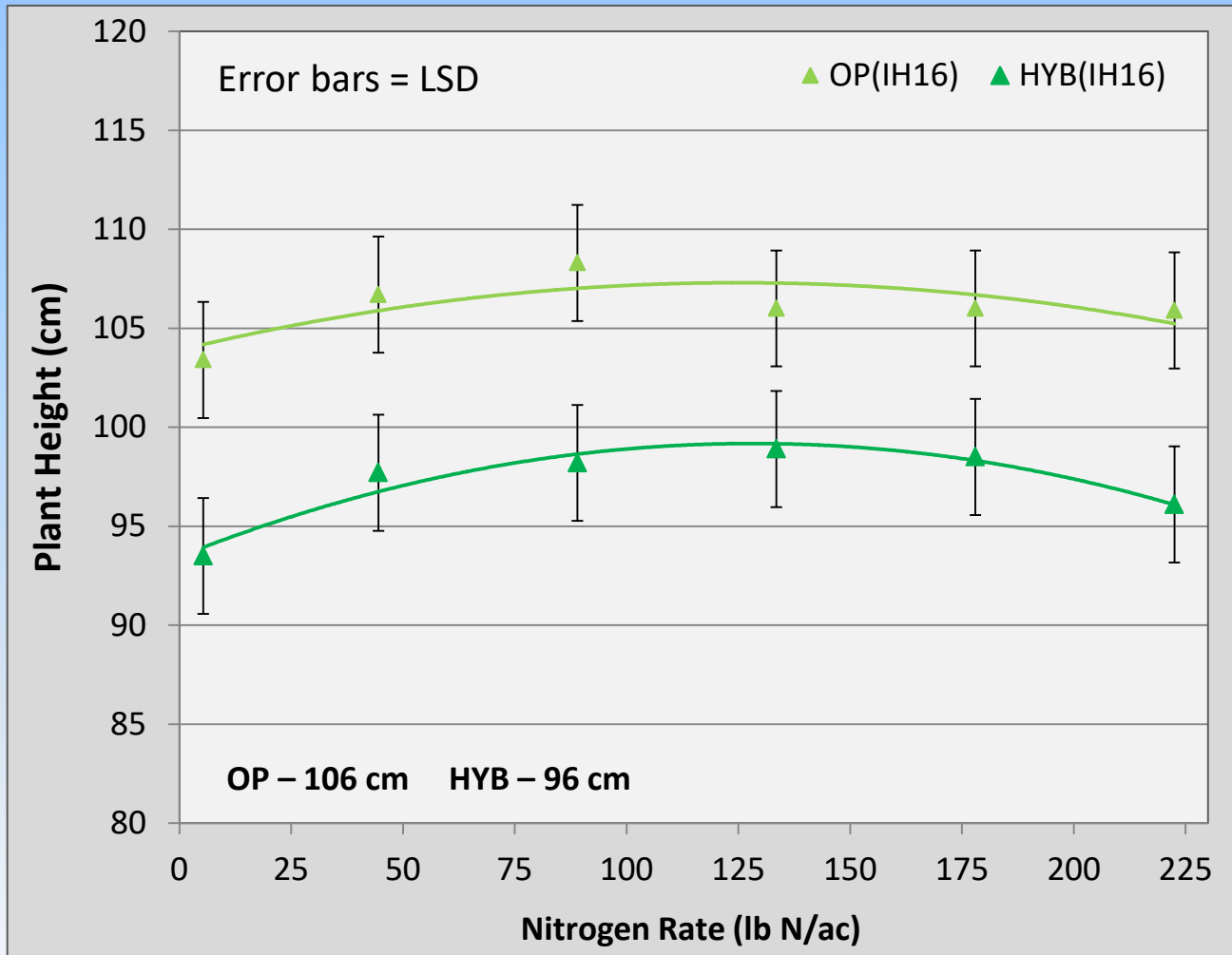
Treatments

2 Varieties: AC Hazlet (OP) & Brasetto (HYB)

6 N Rates: 5, 45, 89, 134, 178 & 223 lb N/ac

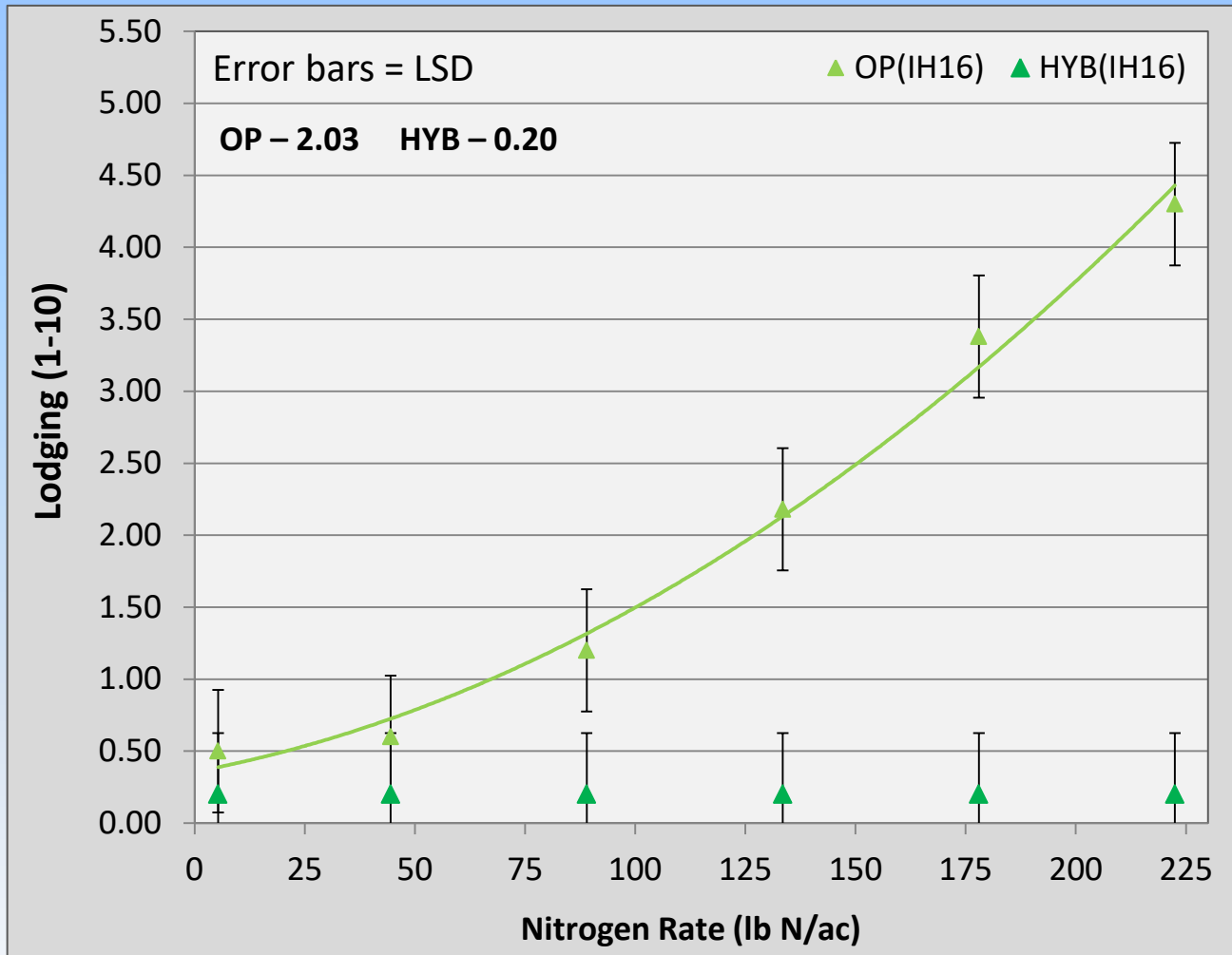
- Fall rye direct-seeded into canola stubble (SeedMaster, 12" spacing) in the 3rd or 4th week of September at 200 seeds/m²
- All fertilizer applied at seeding to provide x-27-47-14 lb N-P₂O₅-K₂O-S/ac (urea & MAP side-banded, K₂SO₄ seed-placed)
- Weeds controlled using pre-emergent & (spring) in-crop herbicides, Caramba applied at early heading
- Pre-harvest glyphosate applied at maturity, centre 5 rows of each plot straight-combined when fit to do so

Hybrid vs OP Fall Rye Nitrogen Response Effects on Plant Height (IH16)



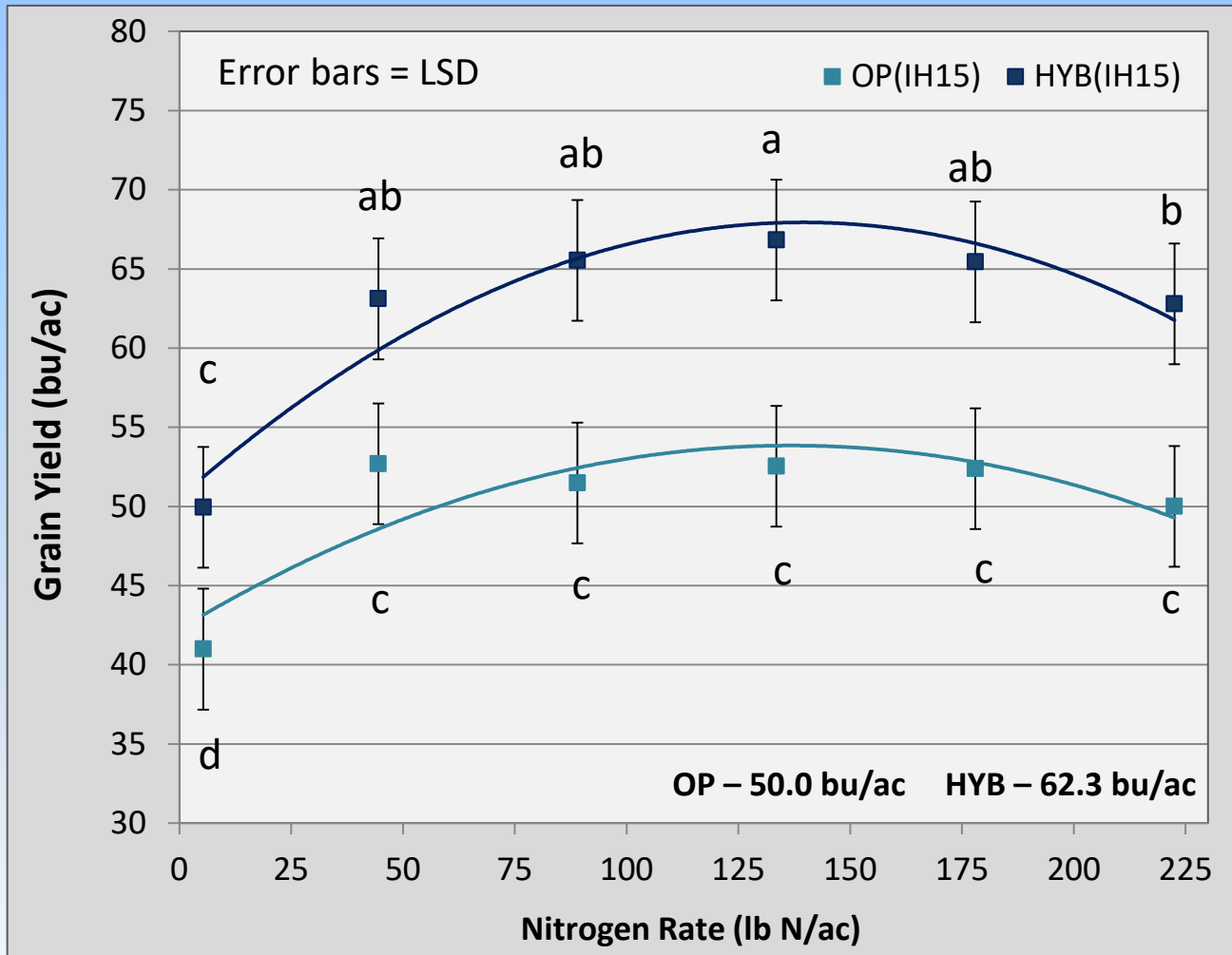
INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
NR	< 0.001
Var × NR	0.553
NR CONTRASTS	
Linear	0.066
Quad	< 0.001
OP-lin	0.379
OP-quad	0.020
HYB-lin	0.081
HYB-quad	< 0.001

Hybrid vs OP Fall Rye Nitrogen Rate Effects on Lodging (IH16)



INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
NR	< 0.001
Var × NR	< 0.001
NR CONTRASTS	
Linear	< 0.001
Quad	0.009
OP-lin	< 0.001
OP-quad	< 0.001
HYB-lin	0.198
HYB-quad	0.726

Hybrid vs OP Fall Rye Nitrogen Rate Effects on Grain Yield (IH15)



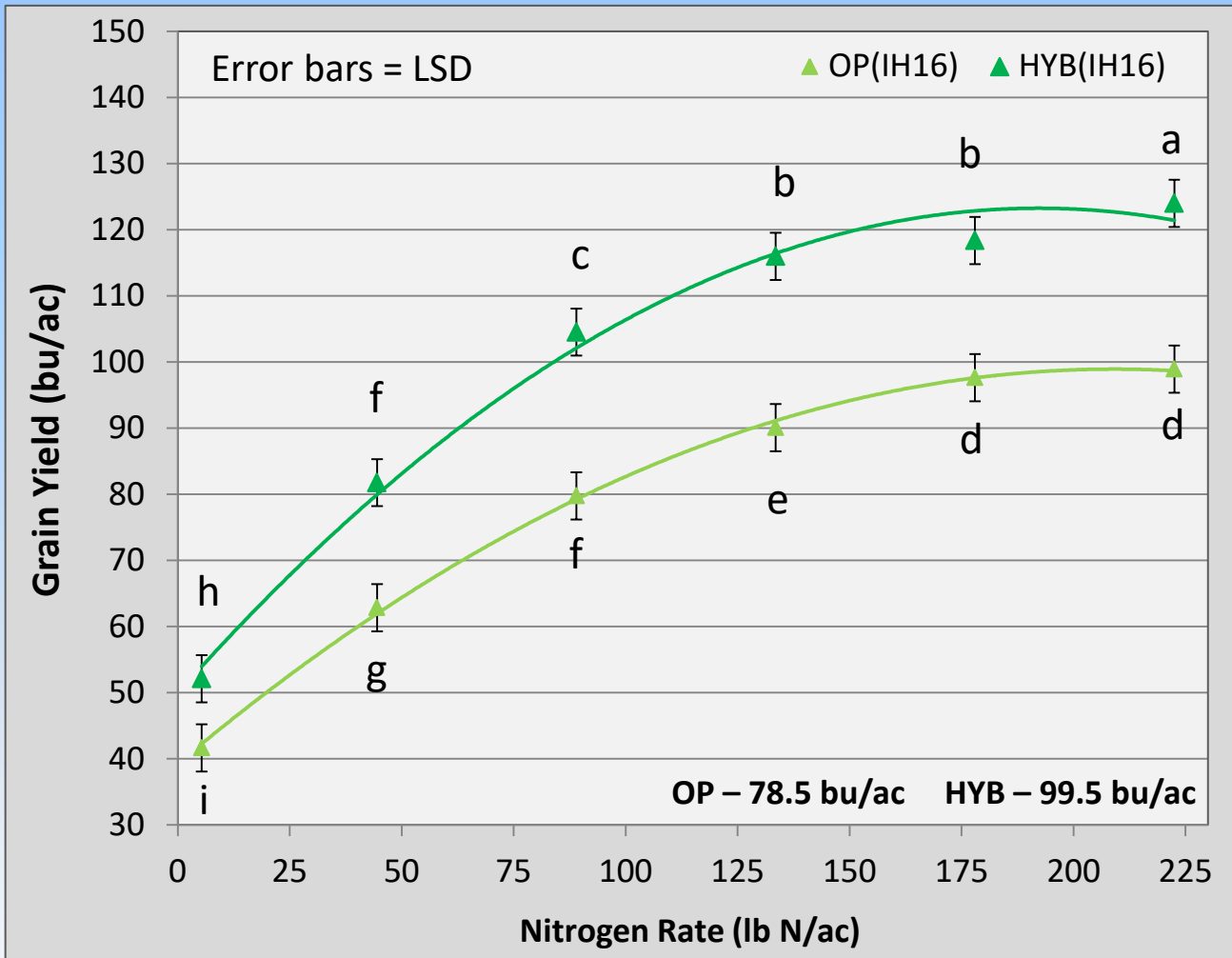
INDIAN HEAD 2015

Effect	p-value
Var	< 0.001
NR	< 0.001
Var × NR	0.295

NR CONTRASTS

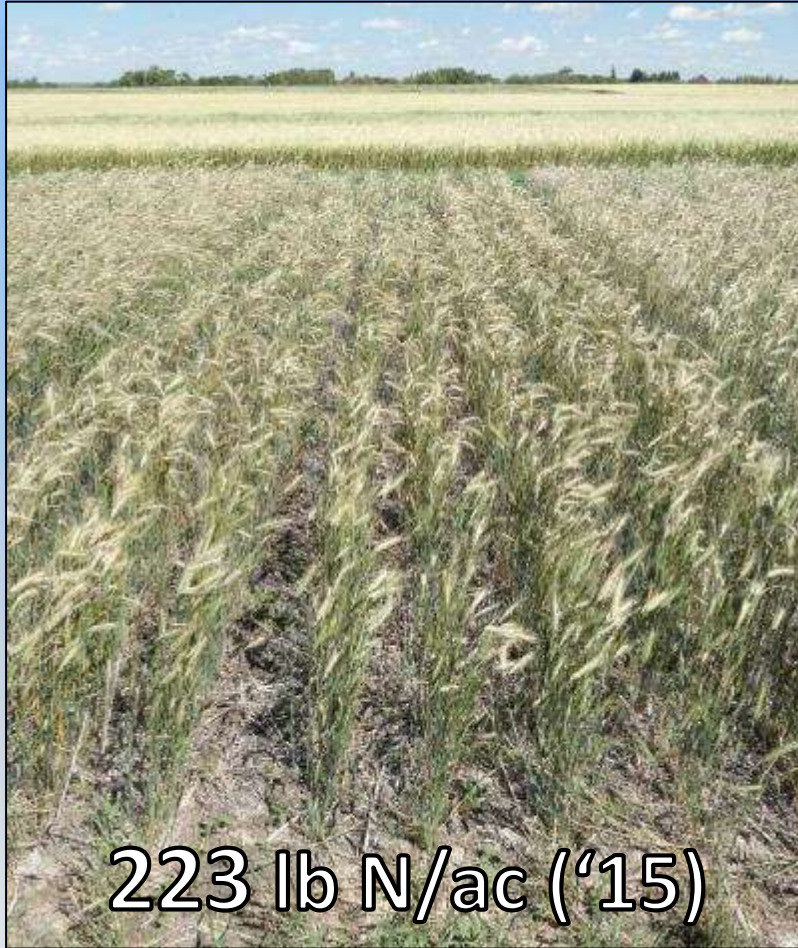
Linear	< 0.001
Quad	< 0.001
OP-lin	< 0.001
OP-quad	< 0.001
HYB-lin	< 0.001
HYB-quad	< 0.001

Hybrid vs OP Fall Rye Nitrogen Rate Effects on Grain Yield (IH16)

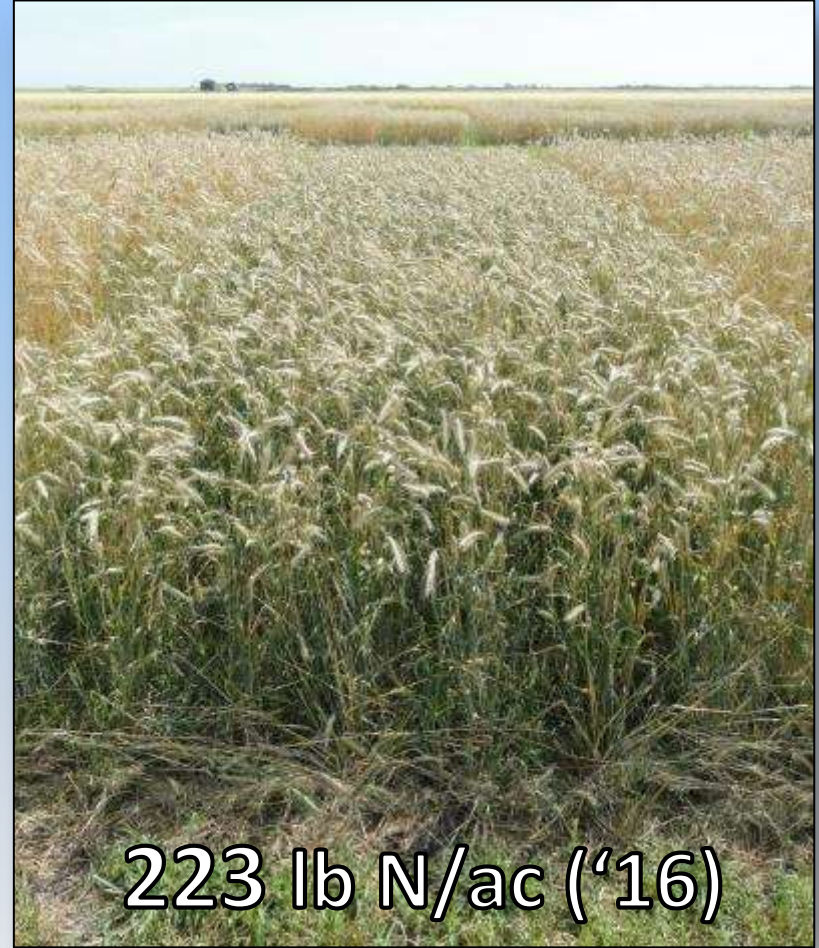


INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
NR	< 0.001
Var × NR	< 0.001
NR CONTRASTS	
Linear	< 0.001
Quad	< 0.001
OP-lin	< 0.001
OP-quad	< 0.001
HYB-lin	< 0.001
HYB-quad	< 0.001

Brasetto Hybrid Fall Rye Indian Head 2015 vs 2016

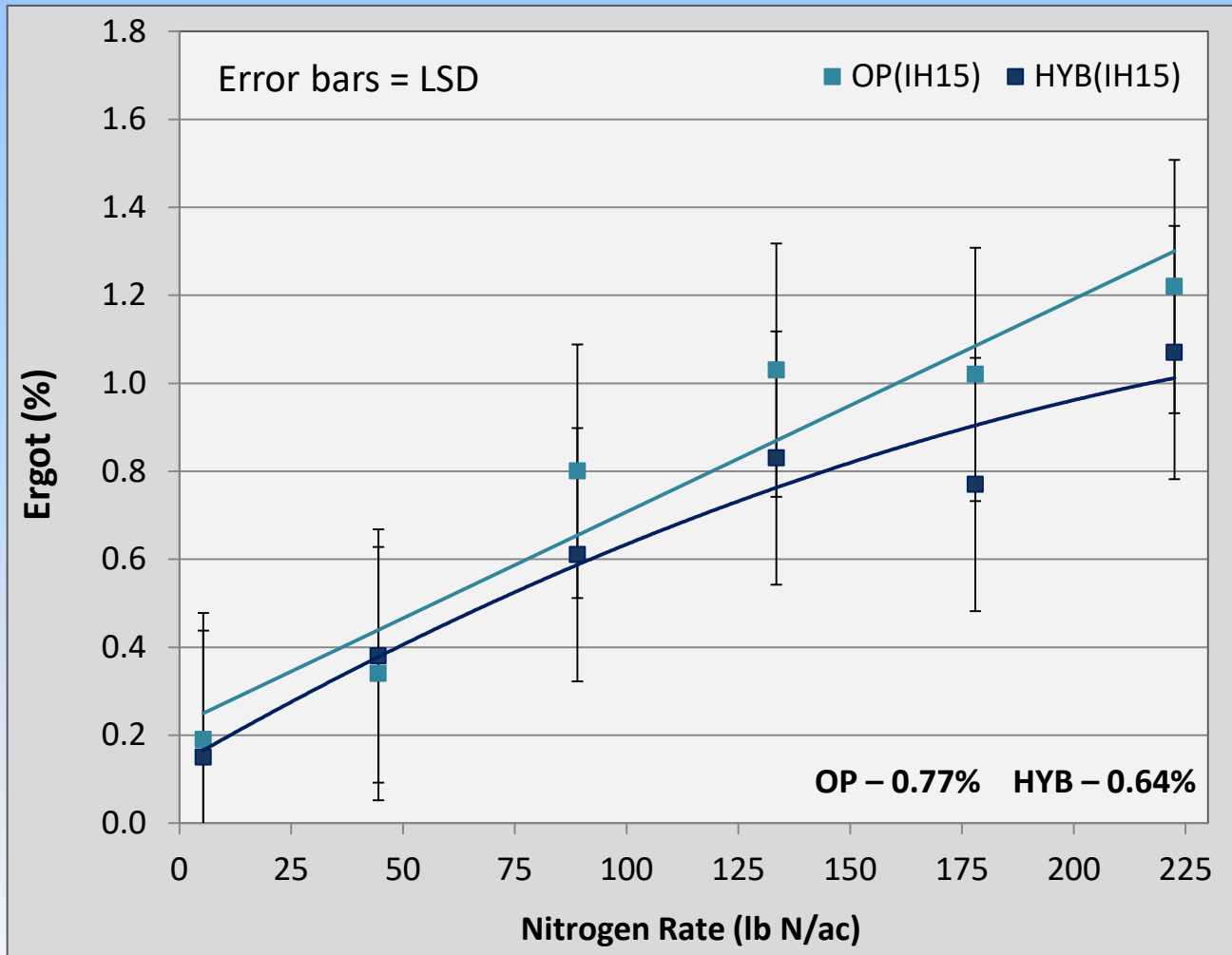


223 lb N/ac ('15)



223 lb N/ac ('16)

Hybrid vs OP Fall Rye Nitrogen Rate Effects on Ergot (IH15)



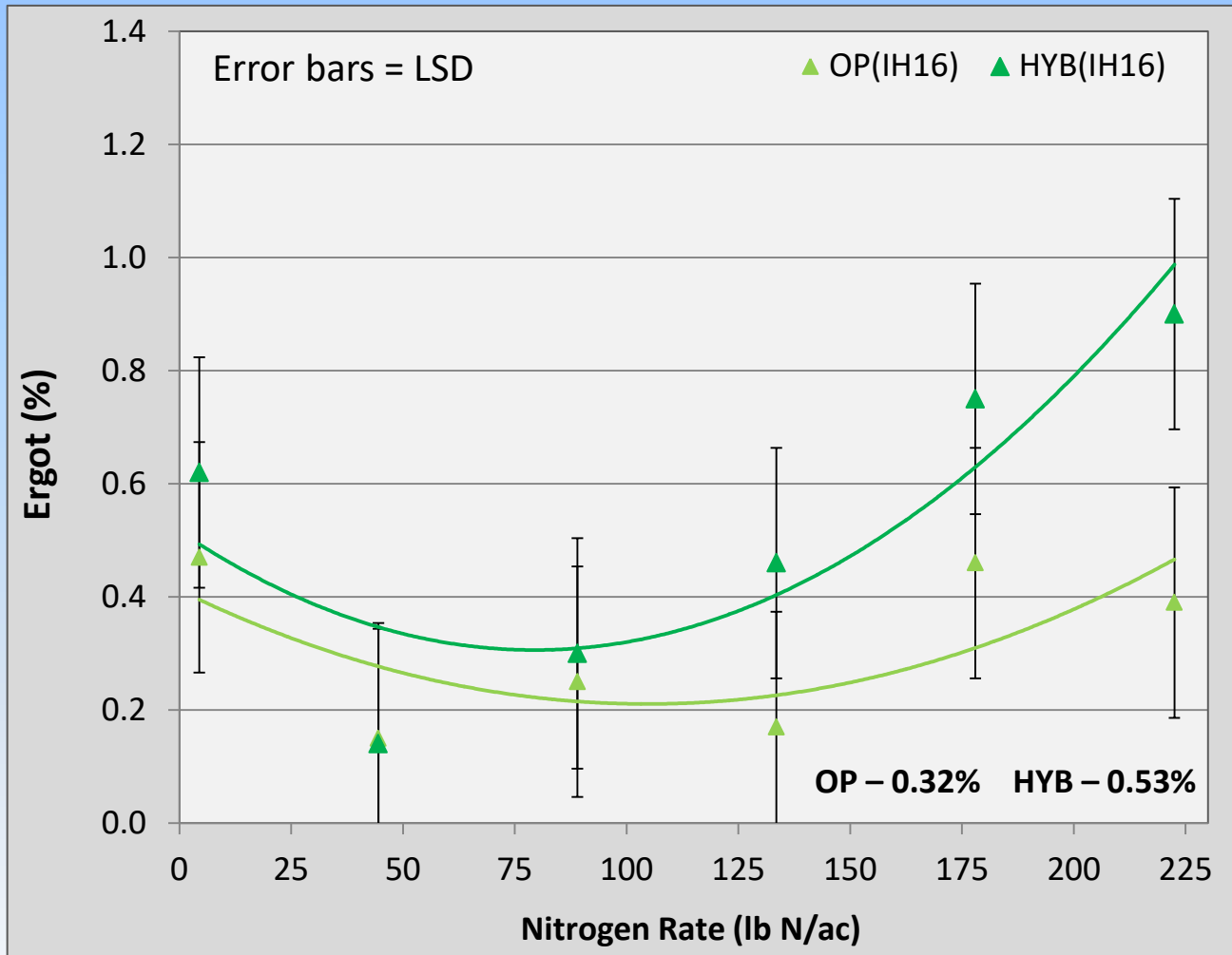
INDIAN HEAD 2015

Effect	p-value
Var	0.028
NR	< 0.001
Var × NR	0.687

NR CONTRASTS

Linear	< 0.001
Quad	0.047
OP-lin	< 0.001
OP-quad	0.055
HYB-lin	< 0.001
HYB-quad	0.032

Hybrid vs OP Fall Rye Nitrogen Rate Effects on Ergot (IH16)



INDIAN HEAD 2016

Effect	p-value
Var	< 0.001
NR	< 0.001
Var × NR	0.009

NR CONTRASTS

Linear	< 0.001
Quad	< 0.001
OP-lin	0.410
OP-quad	0.005
HYB-lin	< 0.001
HYB-quad	< 0.001

Hybrid vs Open Pollinated Fall Rye Response to Seeding Rates

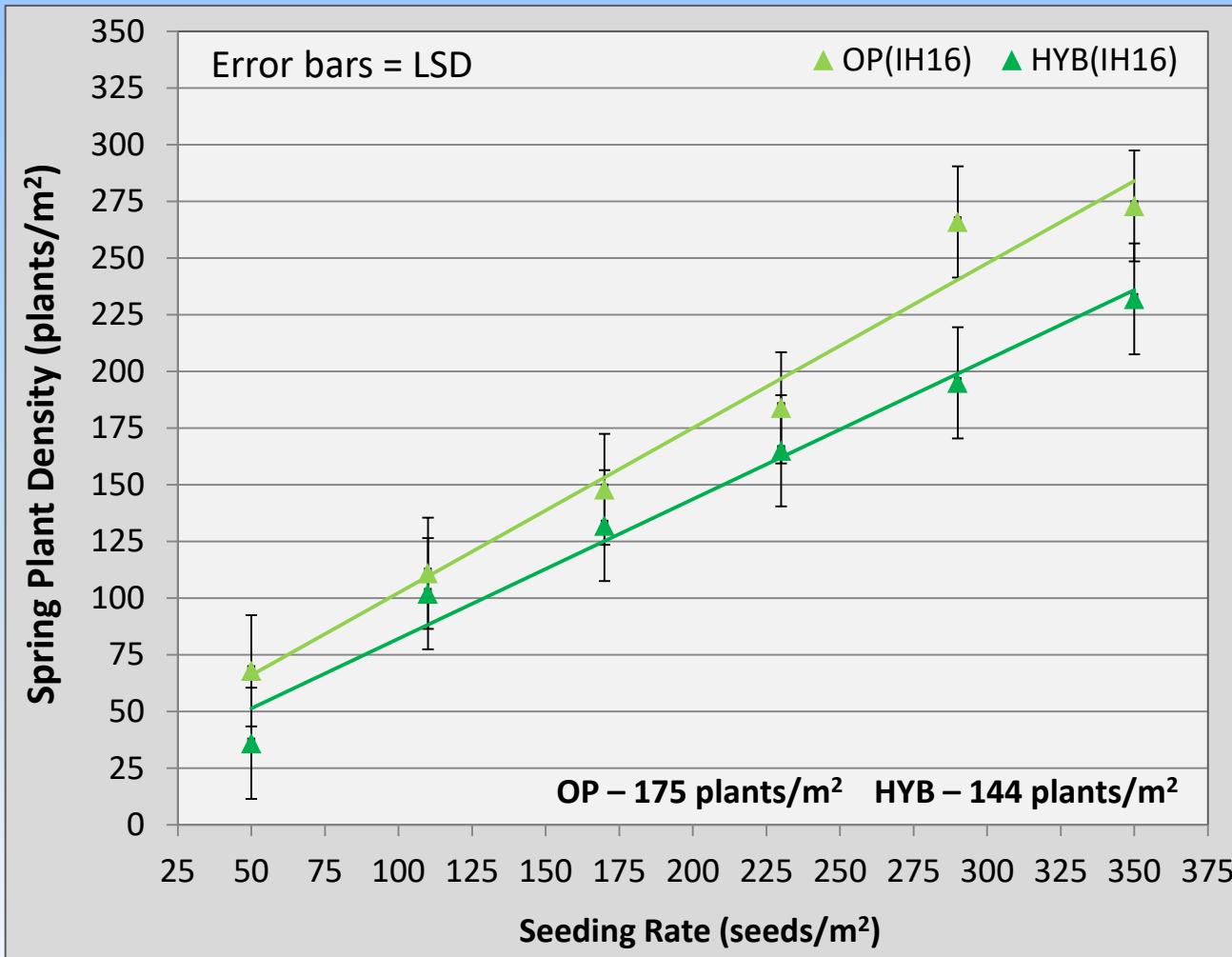
Treatments

2 Varieties: AC Hazlet (OP) & Brasetto (HYB)

6 Seed Rates: 50, 110, 170, 230, 290 & 350 seeds/m²

- Fall rye direct-seeded into canola stubble (SeedMaster, 12" spacing) in the 3rd or 4th week of September at 200 seeds/m²
- All fertilizer applied at seeding to provide 102-27-47-14 lb N-P₂O₅-K₂O-S/ac (urea & MAP side-banded, K₂SO₄ seed-placed)
- Weeds controlled using pre-emergent & (spring) in-crop herbicides, Caramba applied at early heading
- Pre-harvest glyphosate applied at maturity, centre 5 rows of each plot straight-combined when fit to do so

Hybrid vs OP Fall Rye Seeding Rate Effects on Plant Density (IH16)



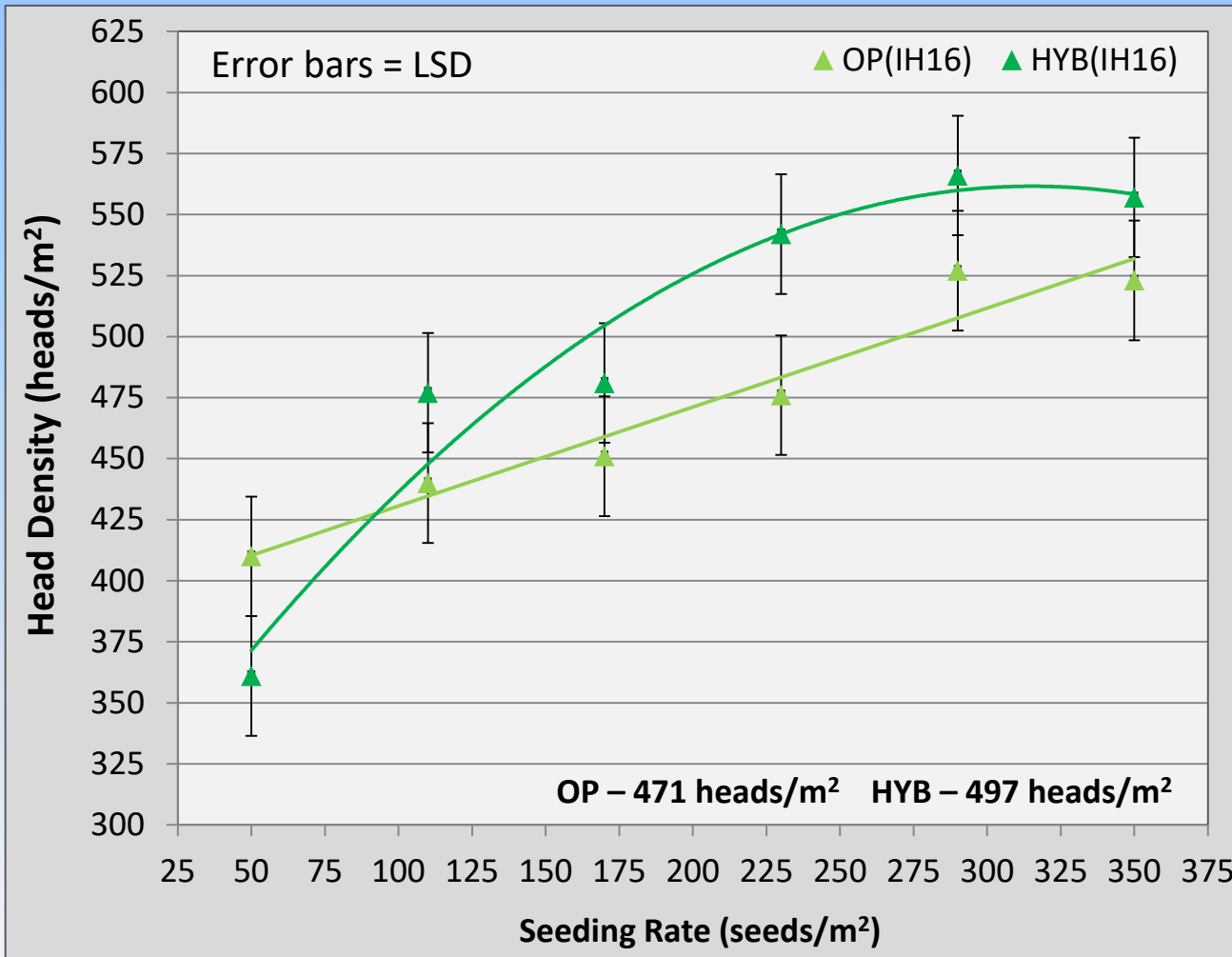
INDIAN HEAD 2016

Effect	p-value
Var	< 0.001
SR	< 0.001
Var × SR	0.012

SR CONTRASTS

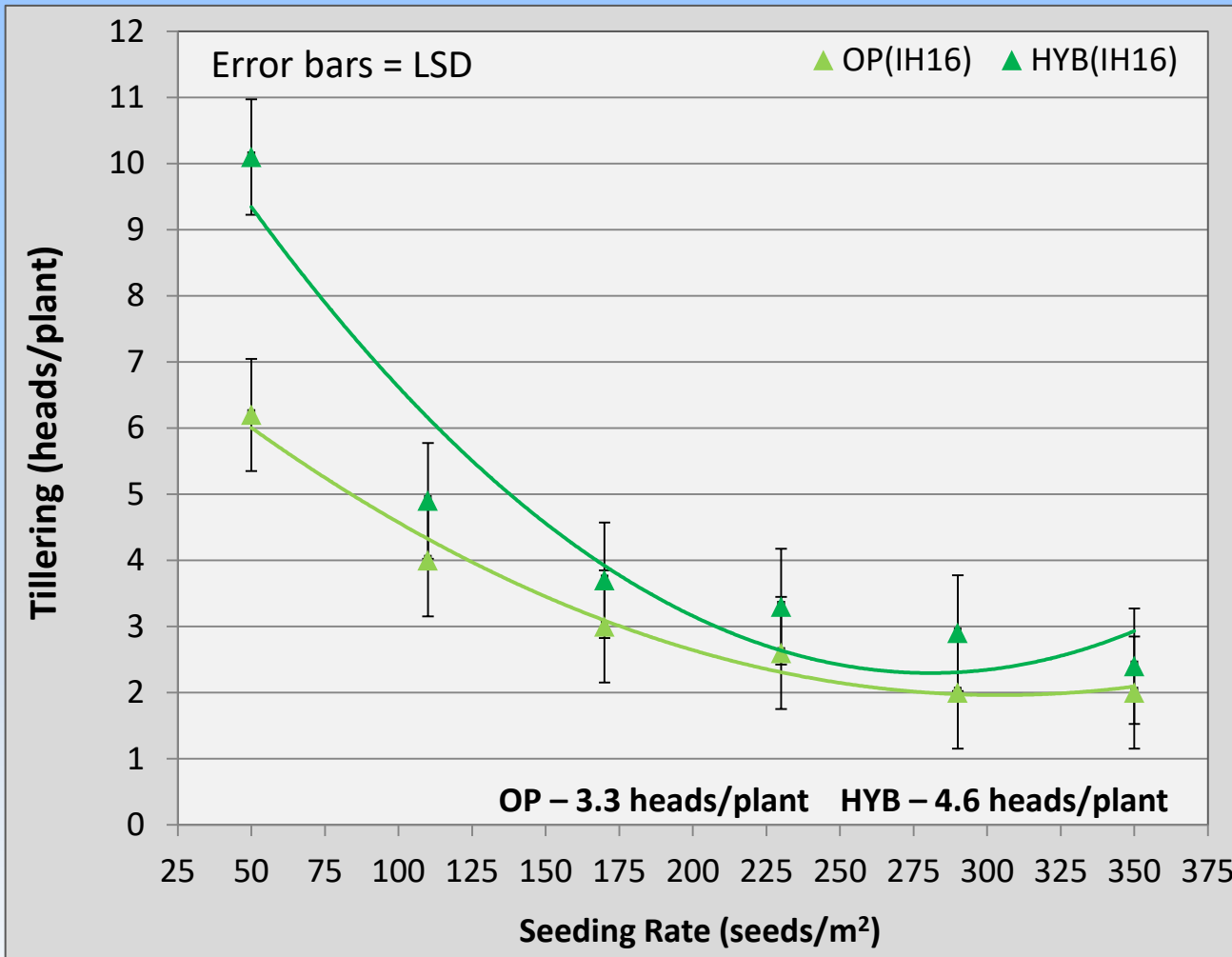
Linear	< 0.001
Quad	0.194
OP-lin	< 0.001
OP-quad	0.982
HYB-lin	< 0.001
HYB-quad	0.073

Hybrid vs OP Fall Rye Seeding Rate Effects on Head Density (IH16)



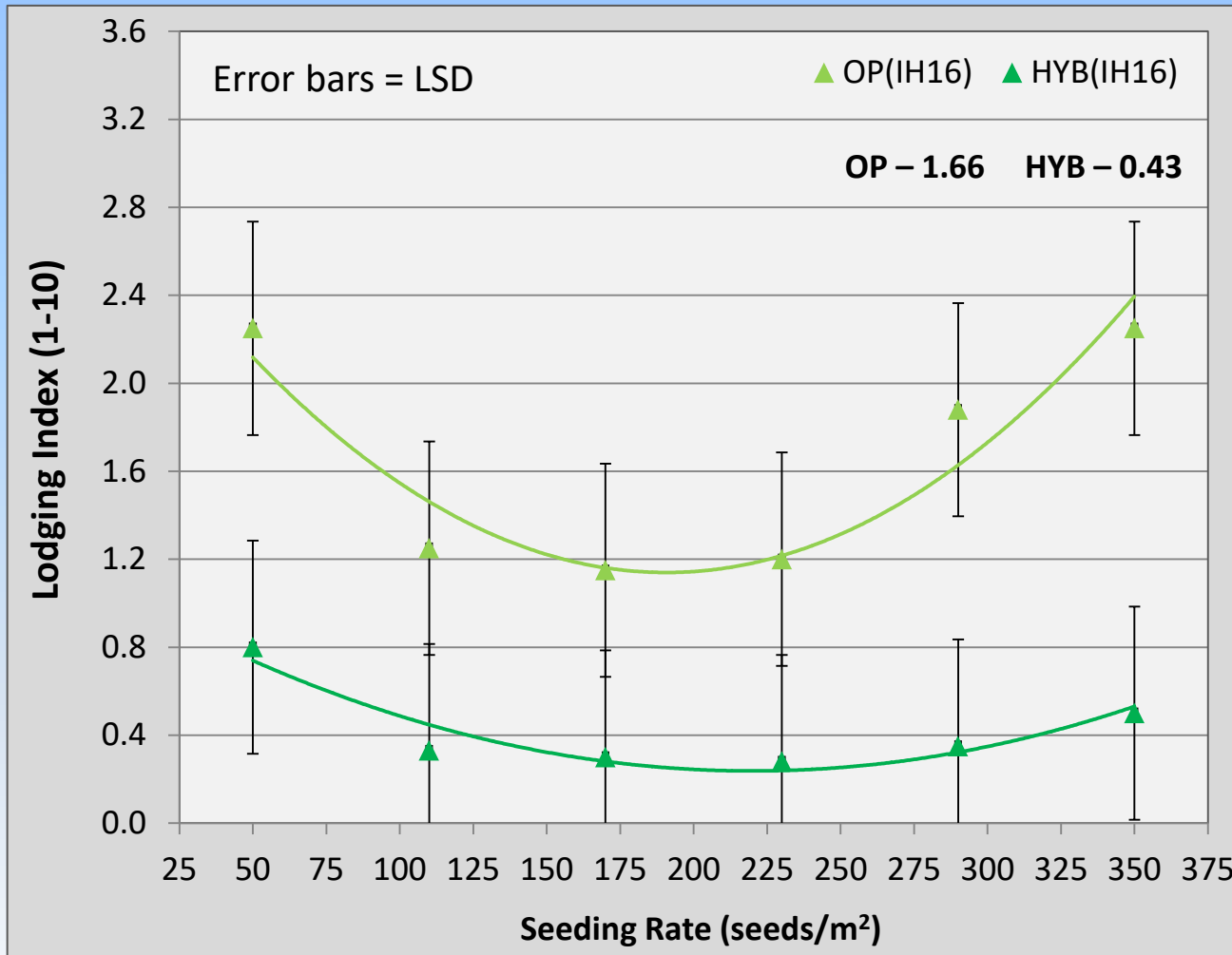
INDIAN HEAD 2016	
Effect	p-value
Var	0.010
SR	< 0.001
Var × SR	0.035
SR CONTRASTS	
Linear	< 0.001
Quad	0.016
OP-lin	< 0.001
OP-quad	0.955
HYB-lin	< 0.001
HYB-quad	0.001

Hybrid vs OP Fall Rye Seeding Rate Effects on Tillering (IH16)



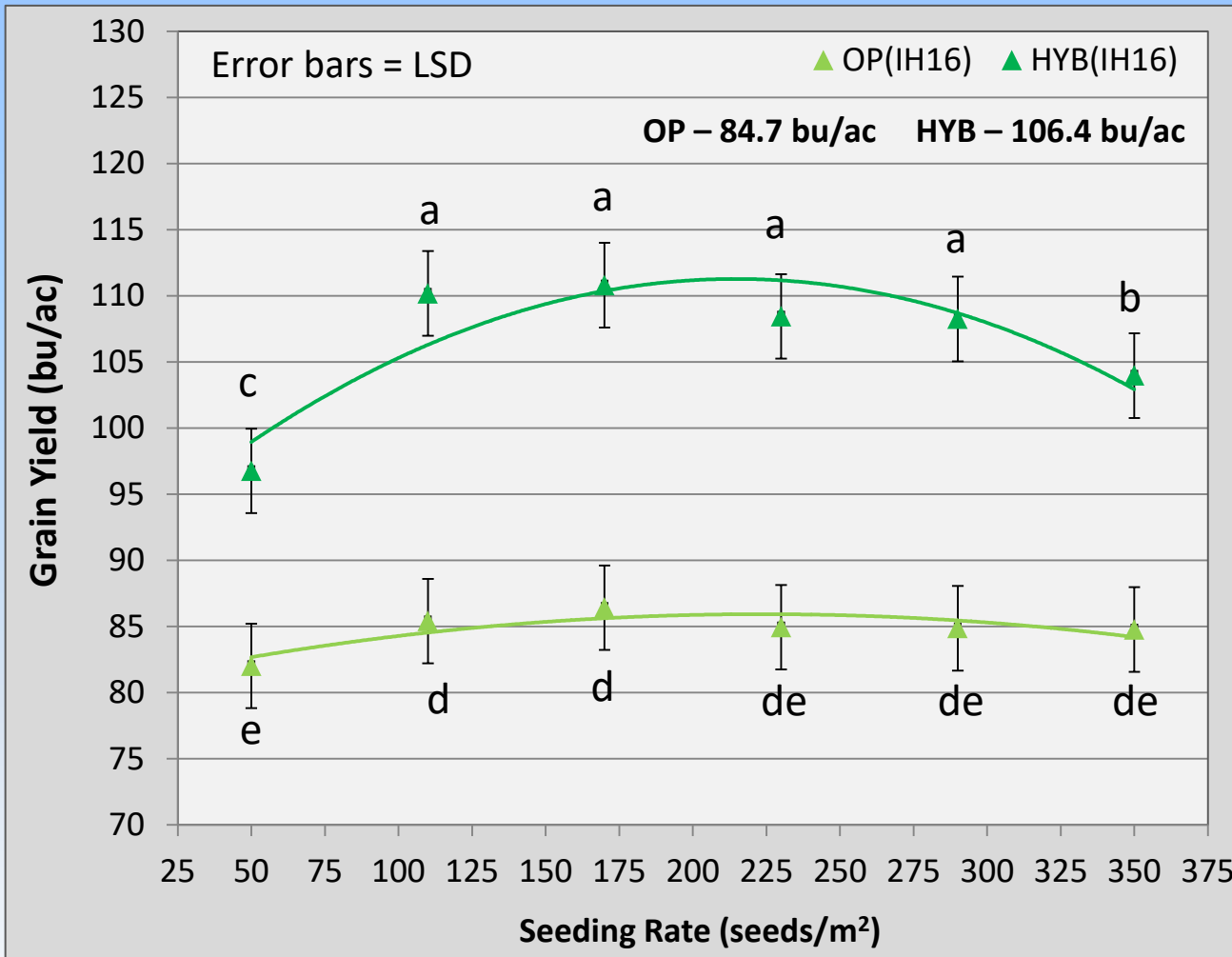
INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
SR	< 0.001
Var × SR	< 0.001
SR CONTRASTS	
Linear	< 0.001
Quad	< 0.001
OP-lin	< 0.001
OP-quad	< 0.001
HYB-lin	< 0.001
HYB-quad	< 0.001

Hybrid vs OP Fall Rye Seeding Rate Effects on Lodging (IH16)



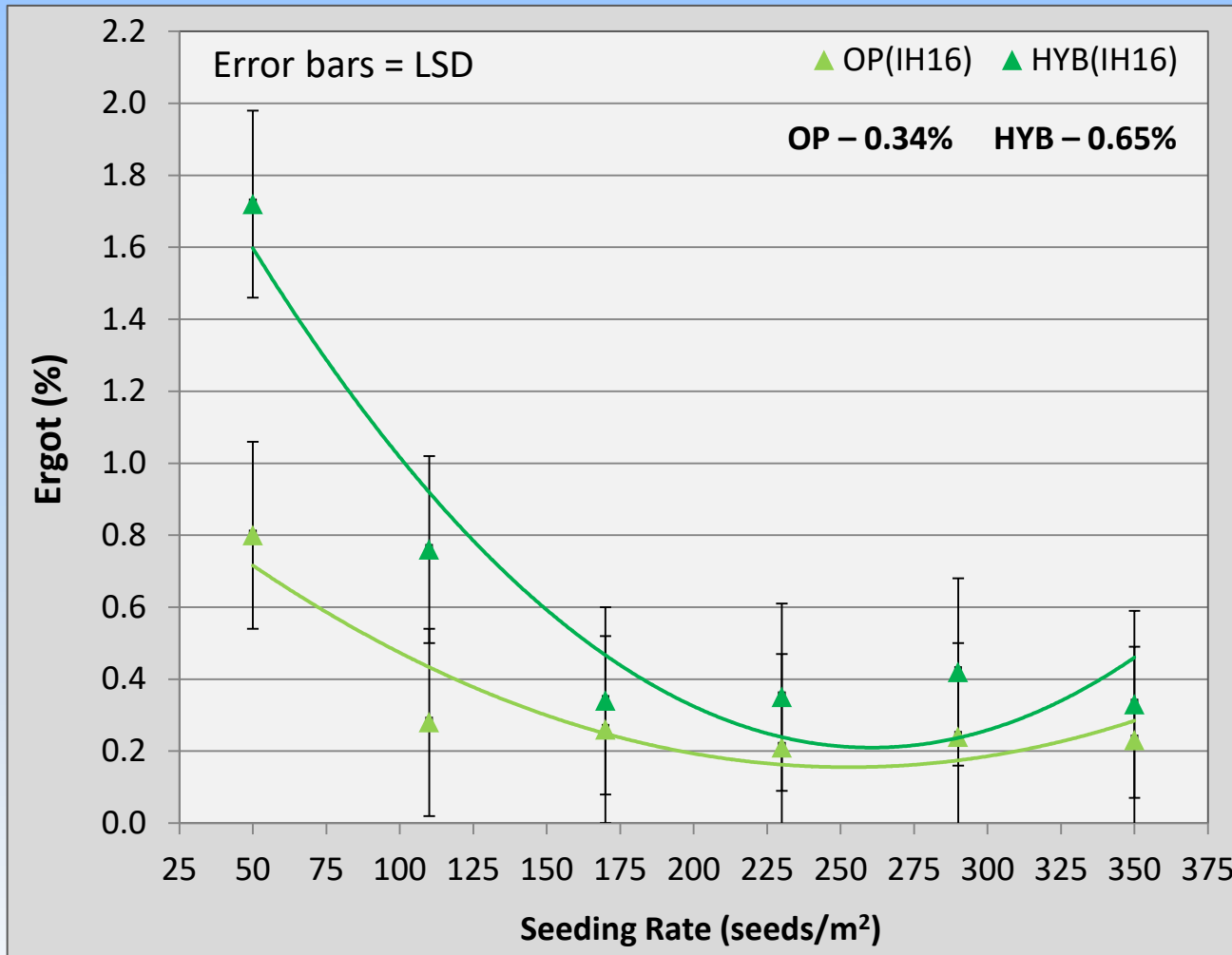
INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
SR	< 0.001
Var × SR	0.044
SR CONTRASTS	
Linear	0.813
Quad	< 0.001
OP-lin	0.182
OP-quad	< 0.001
HYB-lin	0.311
HYB-quad	0.029

Hybrid vs OP Fall Rye Seeding Rate Effects on Grain Yield (IH16)



INDIAN HEAD 2016	
Effect	p-value
Var	< 0.001
SR	< 0.001
Var × SR	< 0.001
CONTRASTS	
Linear	0.006
Quad	< 0.001
OP-lin	0.261
OP-quad	0.041
HYB-lin	0.005
HYB-quad	< 0.001

Hybrid vs OP Fall Rye Seeding Rate Effects on Ergot (IH16)



INDIAN HEAD 2016

Effect	p-value
Var	<0.001
SR	<0.001
Var × SR	<0.001

SR CONTRASTS

Linear	<0.001
Quad	<0.001
OP-lin	<0.001
OP-quad	<0.001
HYB-lin	<0.001
HYB-quad	<0.001

Hybrid Fall Rye Management Take-Home Messages

- Hybrid fall rye performed well w/more uniform heading, superior lodging resistance, higher yield & higher profits compared to open pollinated rye
 - 20-26% higher yield in 2016 SK Seed Guide, 25-27% 2-yr average at Indian Head
- Both varieties responded to high levels of N w/maximum yield achieved at 135/215 lb N/ac for Hazlet & 139/192 lb/ac for Brasetto in 2015/16
 - Similar responses to N rate despite the higher yields with the hybrid variety
- Both varieties compensated well for low plant populations (i.e. increased tillering) but hybrid reached maximum head density at lower plant densities
 - Excellent establishment achieved in trial, rates of 200-220 seeds/m² recommended to ensure maximum yield & quality & to account for potential mortality / winter kill
- Both excessive N rates & (to an even greater extent) low plant densities increased ergot levels – important management consideration since <0.33% ergot results in a sample grade (cleaning for grade improvement?)

Pre-Harvest Options for Straight-Combining Canola

Indian Head 2016 (ADOPT)



2016 Canola Pre-Harvest Demo

(Agricultural Demonstration of Technologies & Practices)

Treatments (Liberty Link[®] canola):

1. **Untreated**
2. **0.67 l/ac Roundup Transorb HC**
~60-65% SCC, applied Aug. 29 (242)
3. **59 ml/ac Heat LQ + 0.2 l/ac Merge**
~ 70-75% SCC, applied Sep. 2 (246)
4. **0.67 l/ac Roundup + 59 ml/ac Heat LQ + 0.2 l/ac Merge**
~ 70-75% SCC, applied Sep. 2 (246)
5. **0.70 l/ac Reglone + 0.1% Agrol 90**
~ 90-95% SCC, applied Sep. 8 (254)

- All treatments applied at 20 U.S. gal/ac solution volume
- Variety – L140P
- Location – Indian Head, SK



Visualization of Crop Stages



Aug 29 (242)

Roundup Applied



Sep 2 (246)

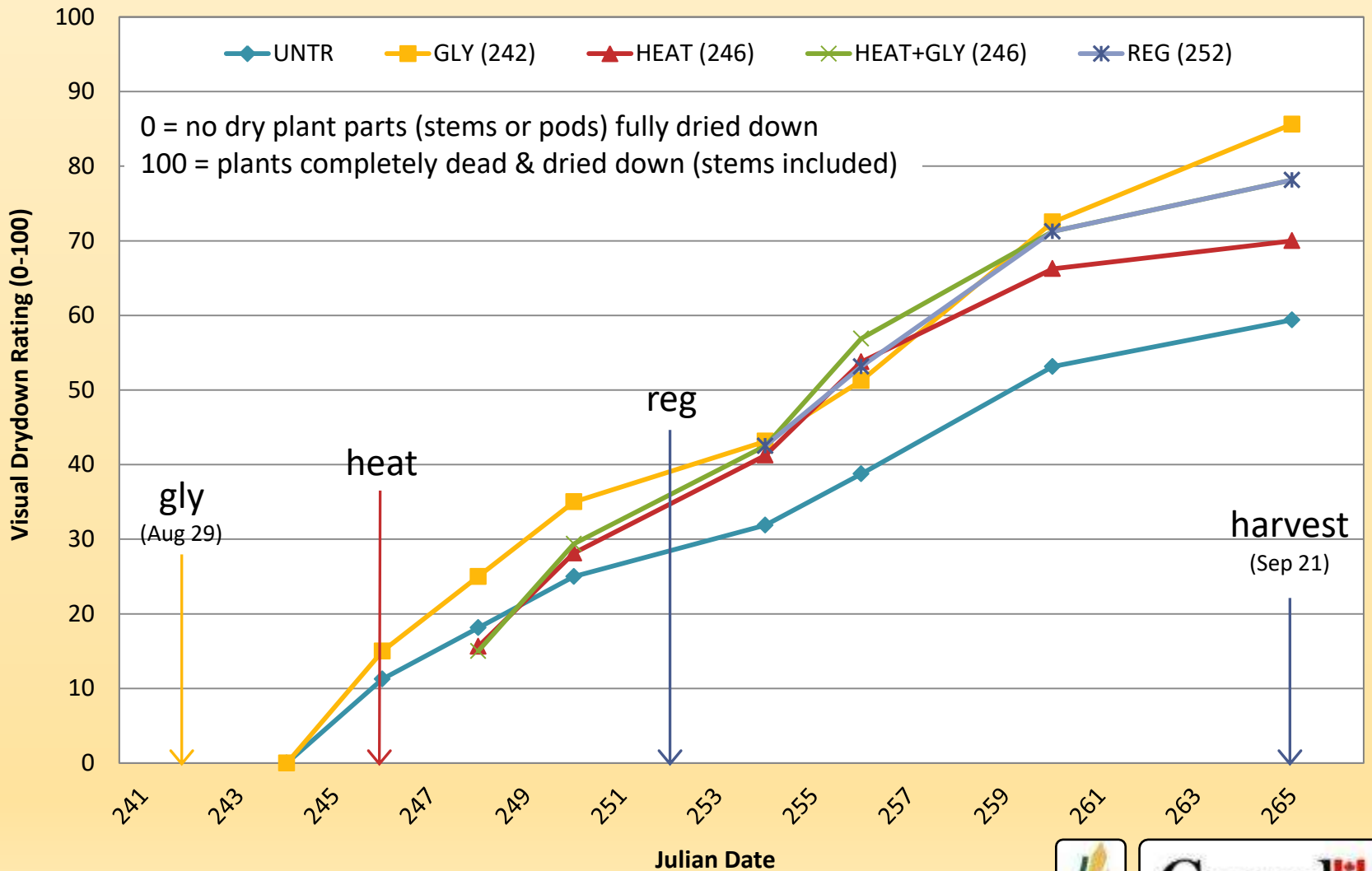
Heat & Roundup + Heat Applied)



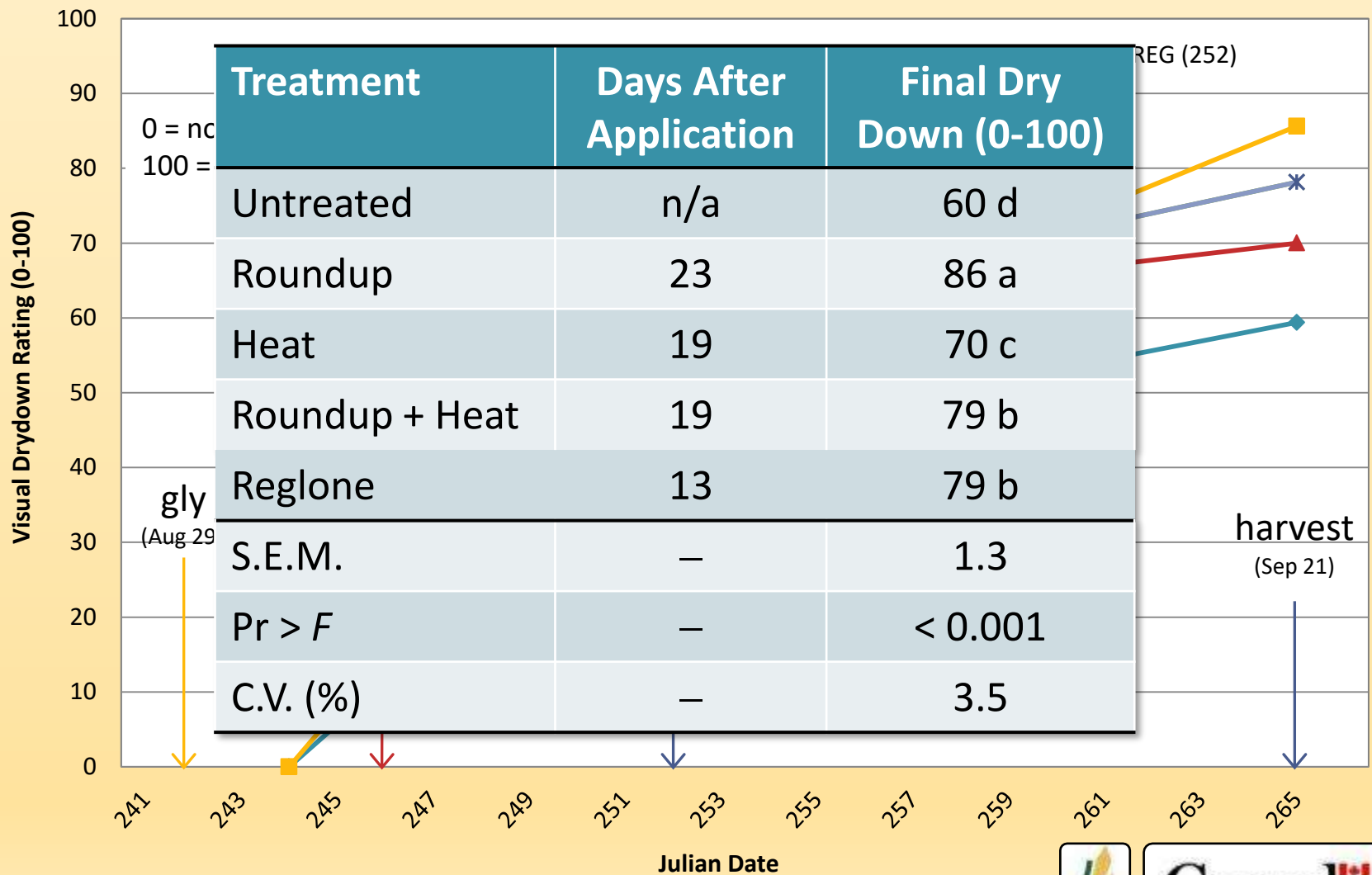
Sep 8 (252)

(Reglone applied)

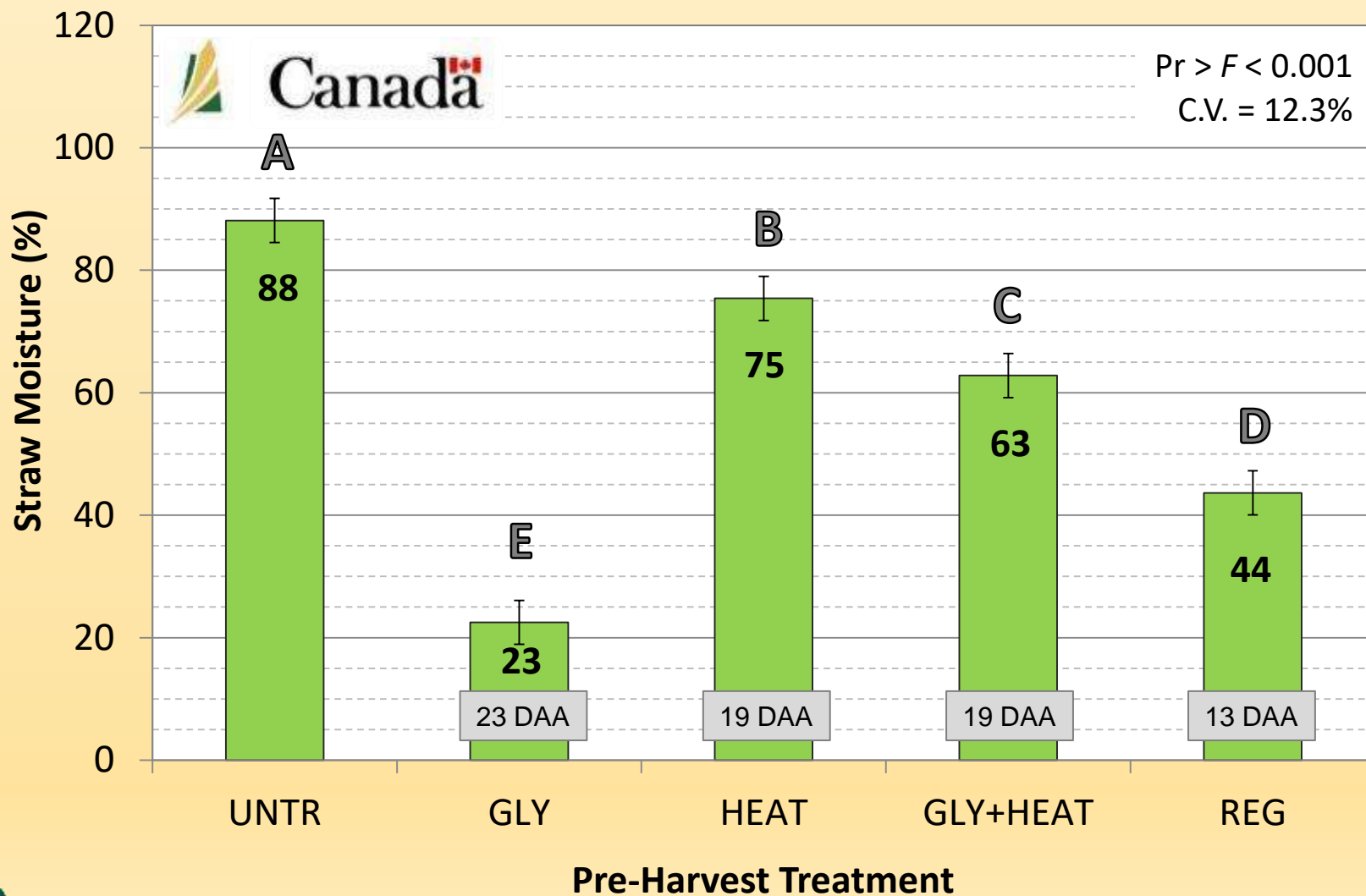
Visual Stem Dry Down (0-100)



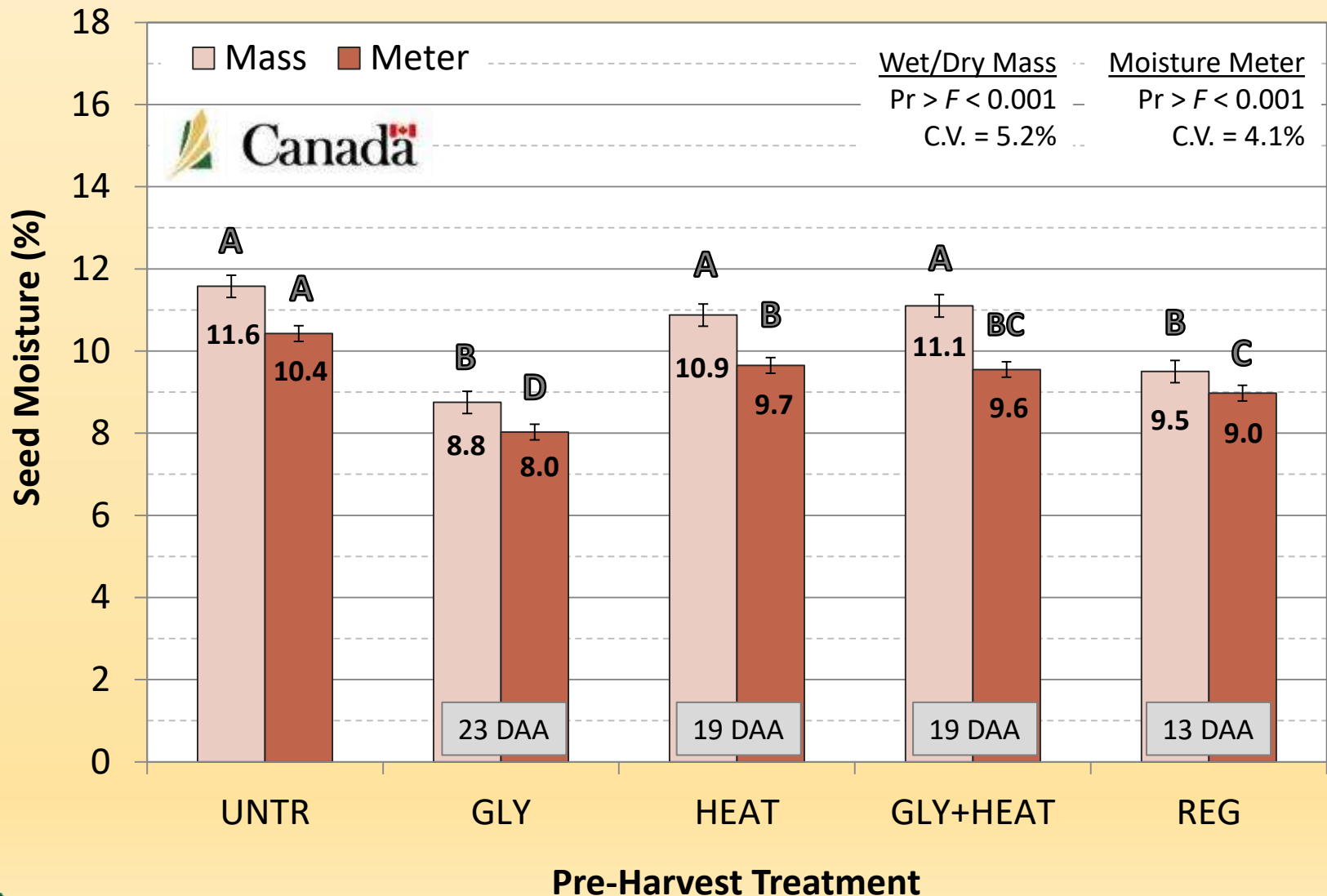
Visual Stem Dry Down (0-100)



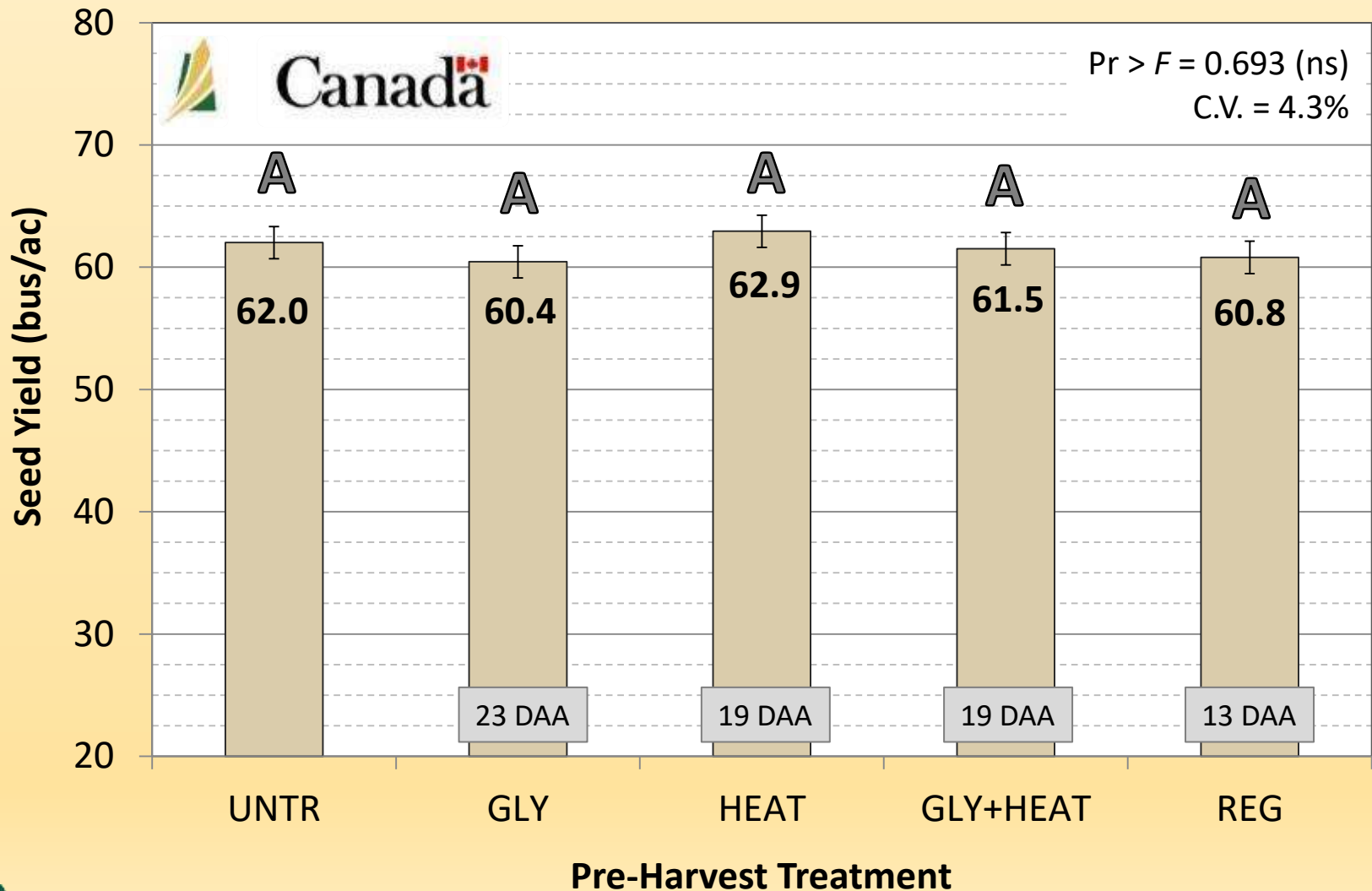
Effects on Whole Plant Moisture



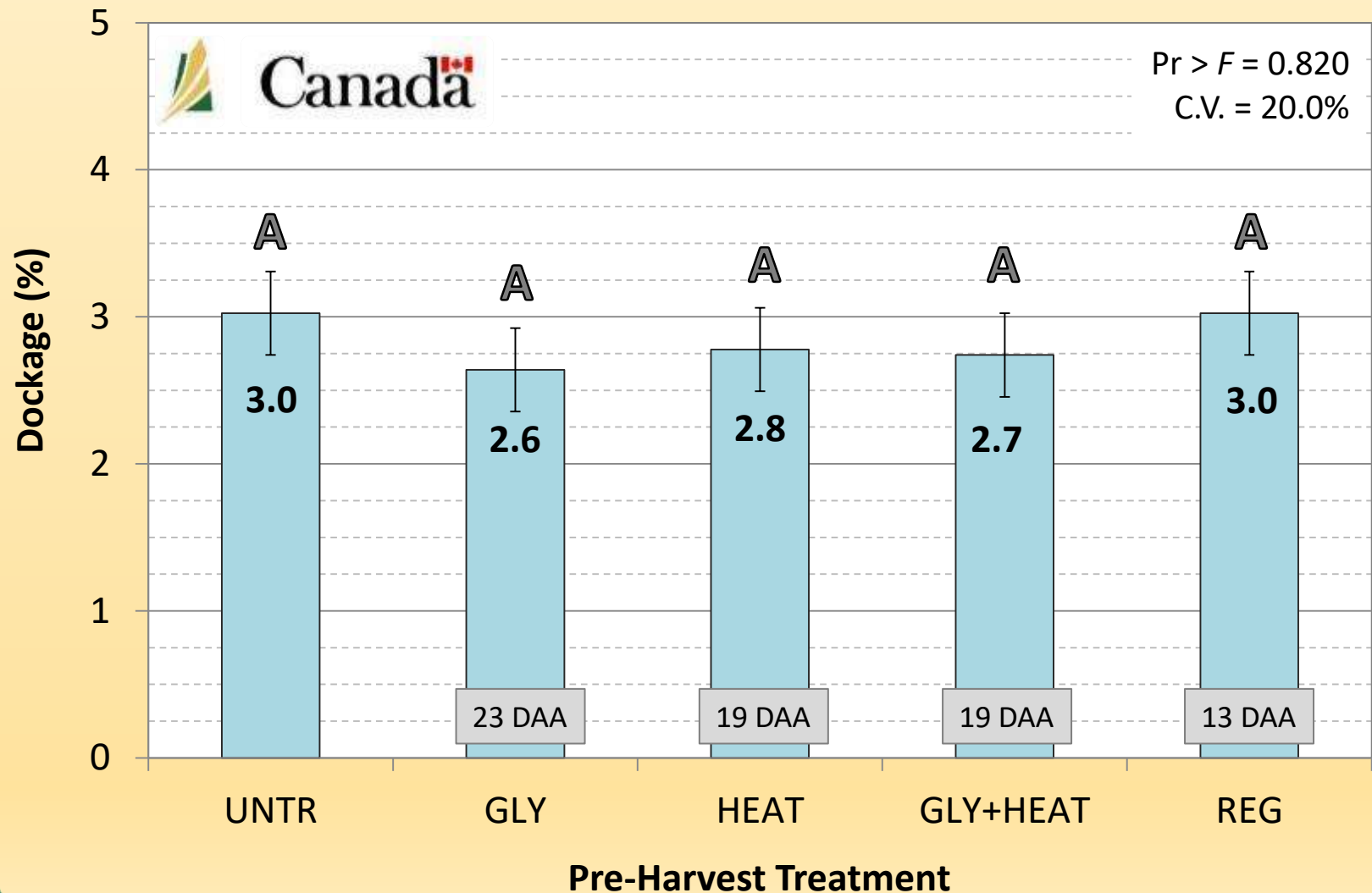
Effects on Seed Moisture



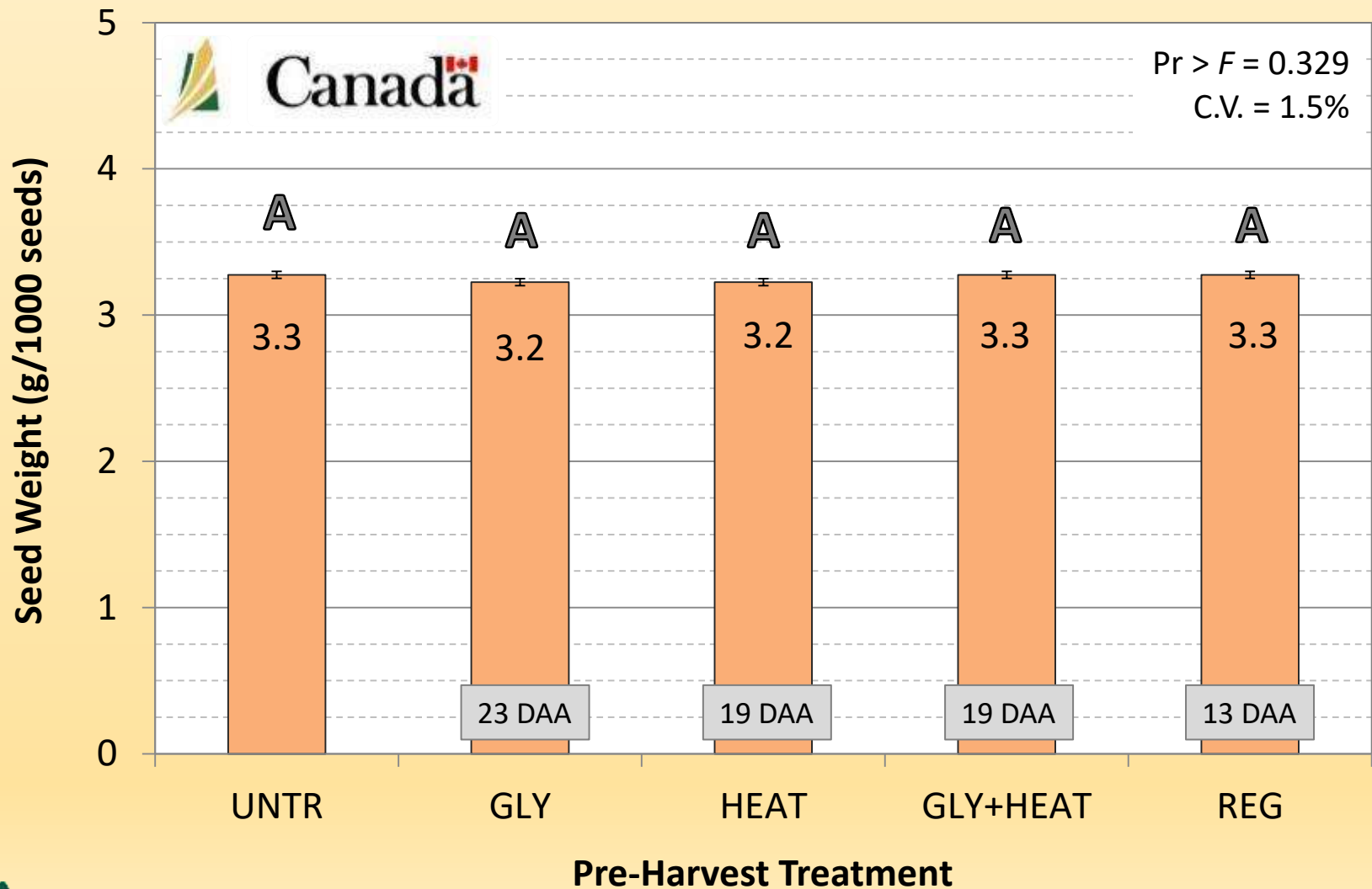
Effects on Canola Seed Yield



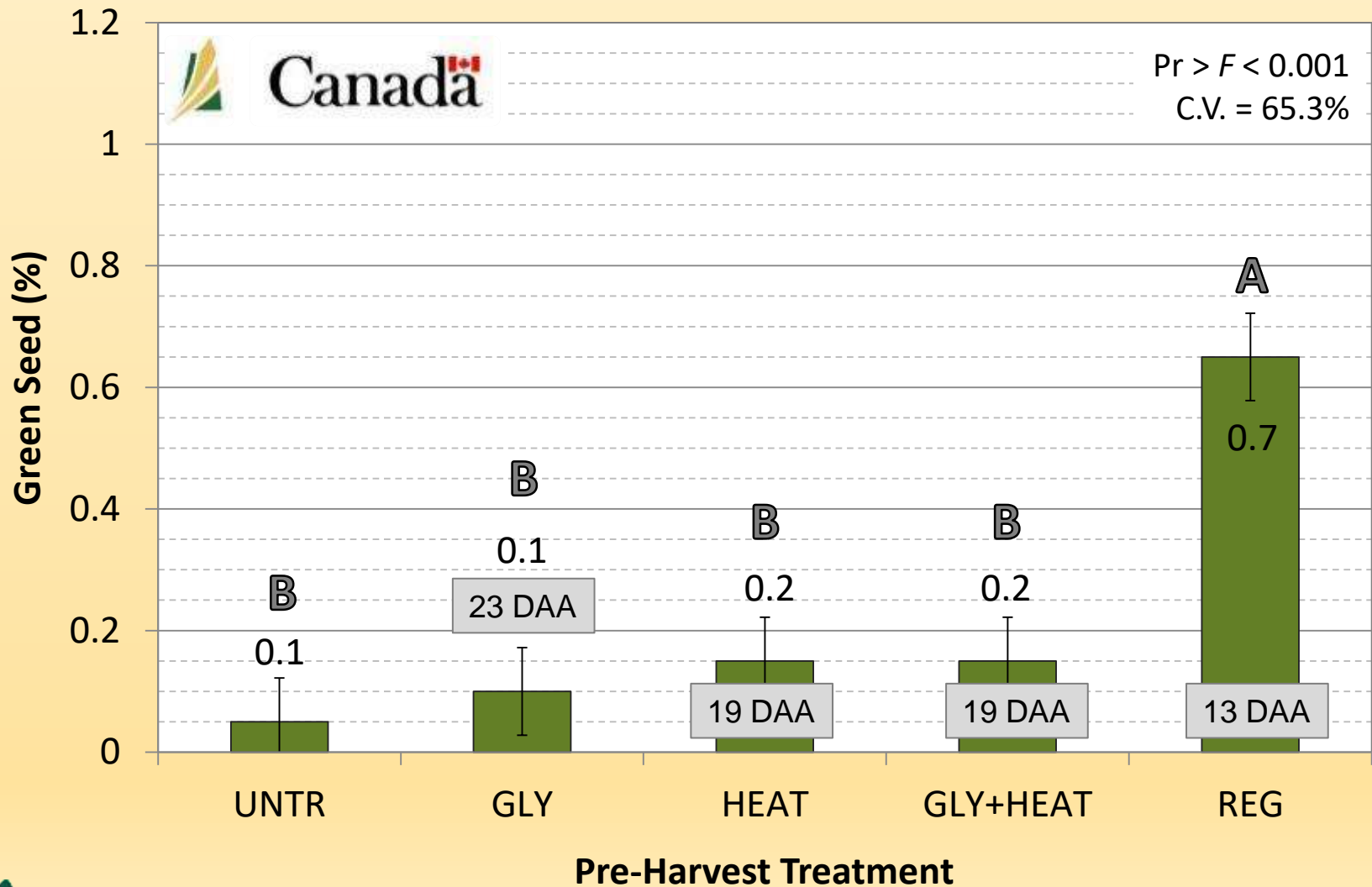
Effects on Percent Dockage



Effects on Seed Weight



Effects on Green Seed



Are Pre-Harvest Applications for Straight-Cut Canola Necessary?

- Not always & the risks associated with not spraying are arguably much lower w/reliable genetic pod shatter tolerance
- Properly applied products should not adversely affect yield or quality but can:
 - Address variation in maturity
 - Enable earlier harvest (in most but not all cases) & make harvest easier to time & plan ahead for
 - Allow for an easier, faster harvest (potentially lower fuel use) by accelerating dry-down of MOG
 - Dry down green weeds, provide an opportunity for perennial weed control
 - Potentially improve storability in some cases (less high moisture dockage & green plant material)



When are pre-harvest applications are most likely to be beneficial?

- Wet, cool weather going into late reproductive stages can delay maturity & lead to stems staying green for prolonged periods
- Low plant populations (i.e. <math><4-5\text{ ft}^2</math>), late seeded or variable fields generally take longer to dry down & make timing operations difficult
- High green weed (especially perennial) densities
- Varieties susceptible to pod drop/shatter (higher risk w/harvest delays)
- Large farms / big acres
 - Straight-combining is slower than picking up swaths, pre-harvest apps don't necessarily always result in earlier harvest but will reduce the risk later than expected harvest (i.e. waiting on green patches, stems, or last few pods)

