2019 IHARF Agronomy Update

Chris Holzapfel, MSc PAg

Presentation Overview

- **4R N Management in Spring Wheat** (2019 Update)
- **Winter Wheat Response to N Rate & Management** (2019)
- **P Rate & Placement in Canola** (2016-2018, multi-site)
- **Dry Bean N Management** (2019, multi-site)
- **Field Pea Fertility** (2019, multi-site)
- **Wheat Response to Various Input Combinations** (2018-19)
- **Pre-harvest Options for Canola** (2017-19, multi-site)

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Enhanced Fertility for Optimizing Field Pea Yield & Protein (SPG)

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SPG Field Pea Fertility Trials: Locations & Treatments

Locations (6):

1. **Swift Current** (dry Brown soil)
2. **Outlook** (Brown soil)
3. **Scott** (Dark Brown)
4. **Indian Head** (thin Black)
5. **Yorkton** (Black)
6. **Melfort** (moist Black)

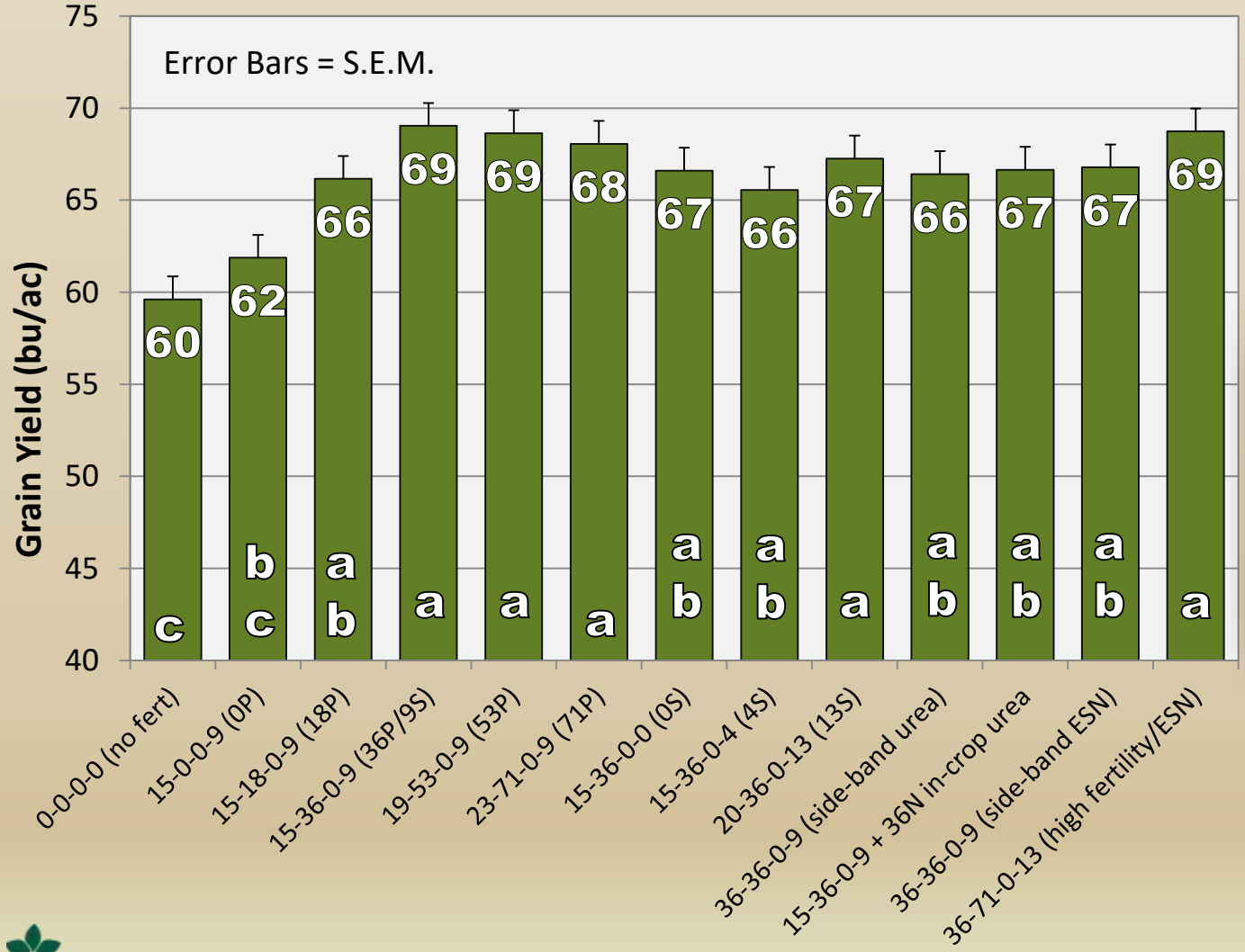
Treatments (13):

#	lb N-P_2O_5-K_2O-S/ac
1	0-0-0-0 **(no fertilizer)**
2	15-0-0-9 **(0 P)**
3	15-18-0-9 **(18 P)**
4	15-36-0-9 **(36 P / 9 S)**
5	19-53-0-9 **(53 P)**
6	23-71-0-9 **(71 P)**
7	15-36-0-0 **(0 S)**
8	15-36-0-4 **(4 S)**
9	20-36-0-13 **(13 S)**
10	36-36-0-9 **(36 N as MAP/AS/urea)**
11[Z]	15-36-0-9 **(+ 36 N in-crop broadcast urea)**
12[Y]	36-36-0-9 **(36 N as MAP/AS/ESN)**
13[Y]	36-71-0-13 **(ultra high fertility / ESN)**

[Z] In-crop N broadcast approximately 4-5 weeks after emergence, prior to flowering
[Y] ESN (44-0-0) instead of urea as the supplemental N source in Trt #12 and 13
***All fertilizer side-banded unless otherwise indicated**

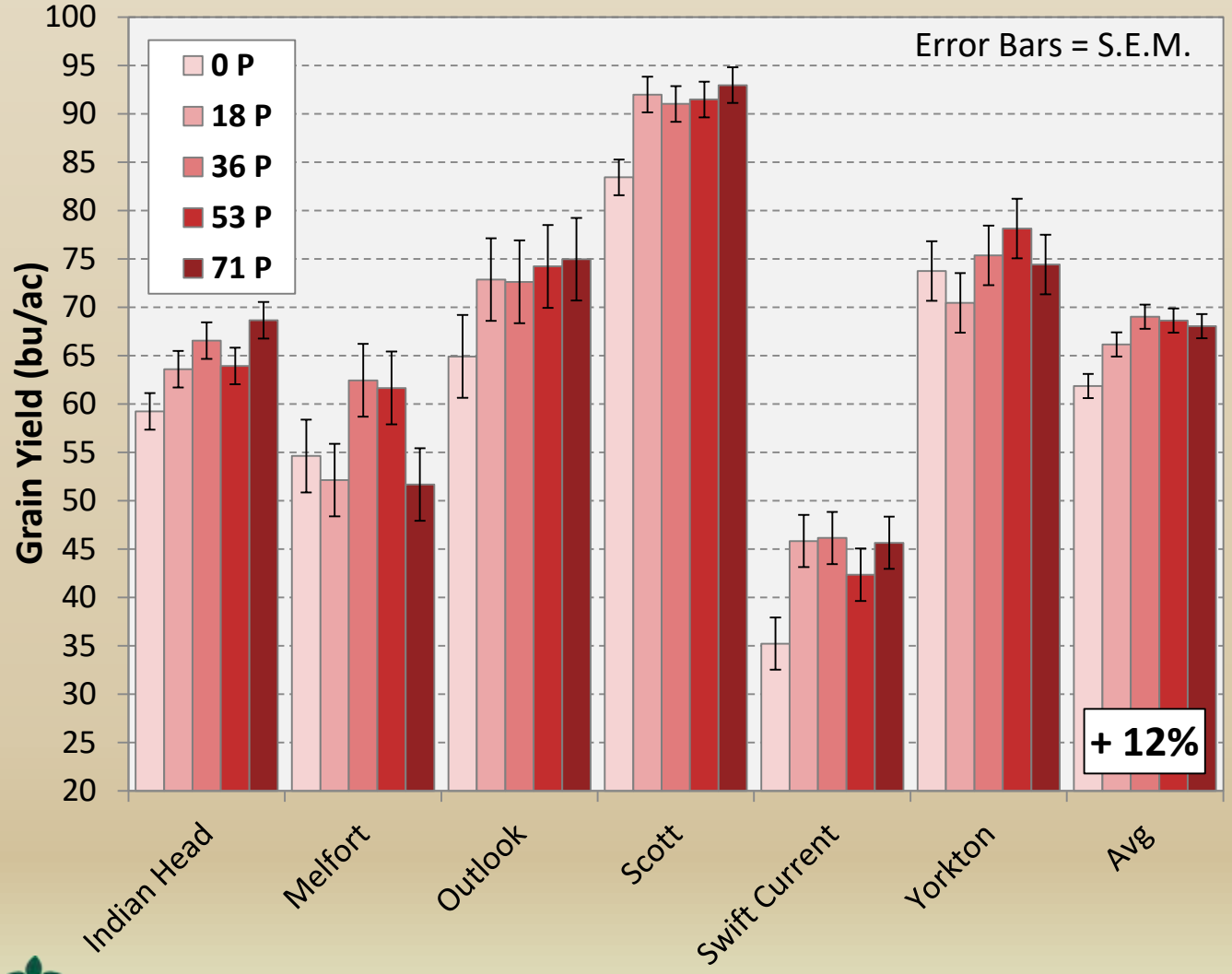
Fertility Effects on Field Pea Yield

Average of 6 Locations (2019)



Source	Pr > F
Fertility (F)	<0.001
Location (L)	<0.001
F x L	<0.001

Field Pea Yield Response to Phosphorus Rate by Location (2019)



LOC	LIN	QUAD
IH	***	ns
ME	ns	**
OL	*	ns
SC	***	***
SW	**	**
YK	ns	ns
AVG	***	***

ns: $P > 0.10$
*: $P > 0.05 \leq 0.10$
**: $P > 0.01 \leq 0.05$
***: $P \leq 0.01$

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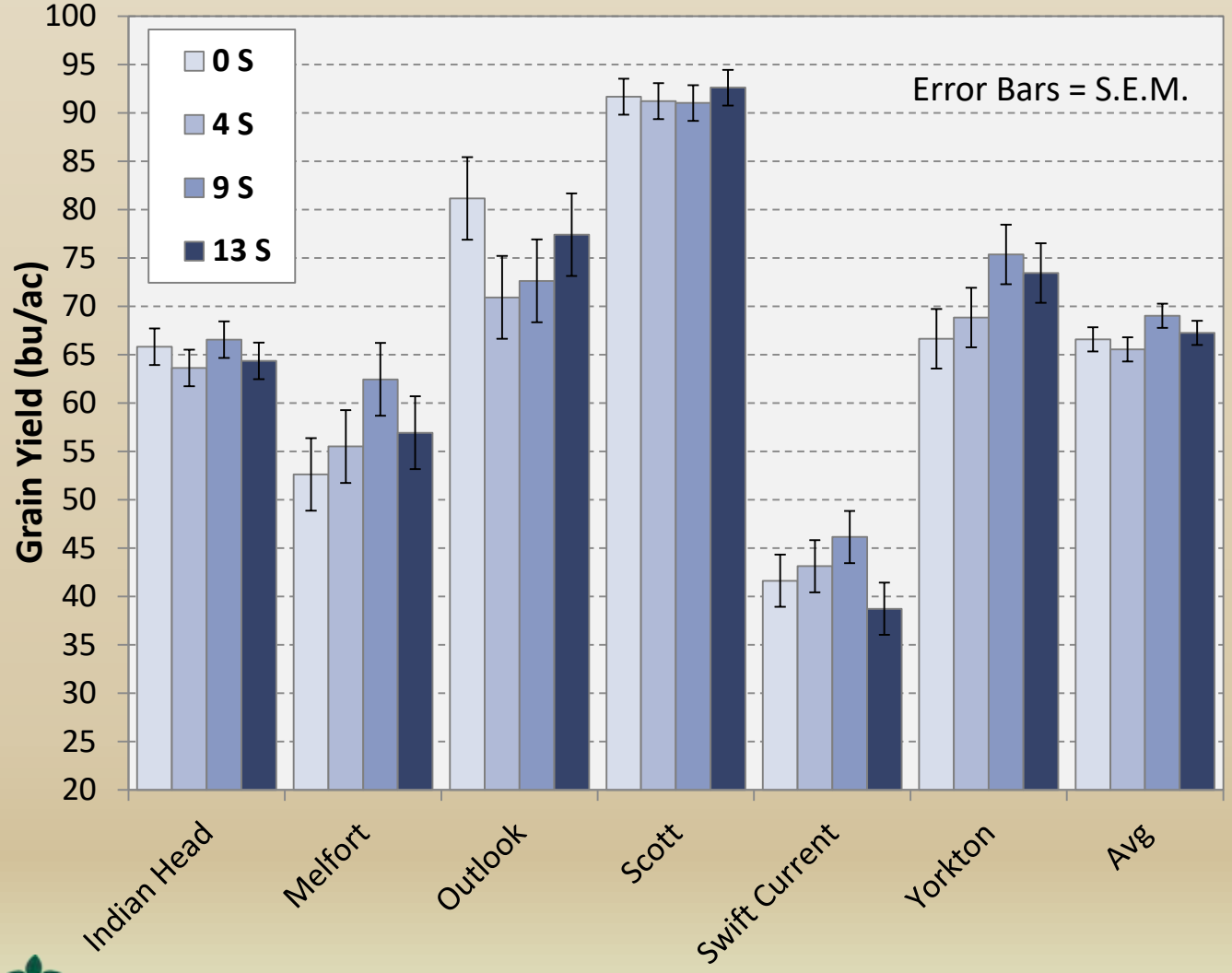
Field Pea Yield Response to Sulphur Rate by Location (2019)



LOC	LIN	QUAD
IH	ns	ns
ME	ns	ns
OL	ns	*
SC	ns	ns
SW	ns	*
YK	**	ns
AVG	ns	ns

ns: $P > 0.10$
*: $P > 0.05 \leq 0.10$
**: $P > 0.01 \leq 0.05$
***: $P \leq 0.01$

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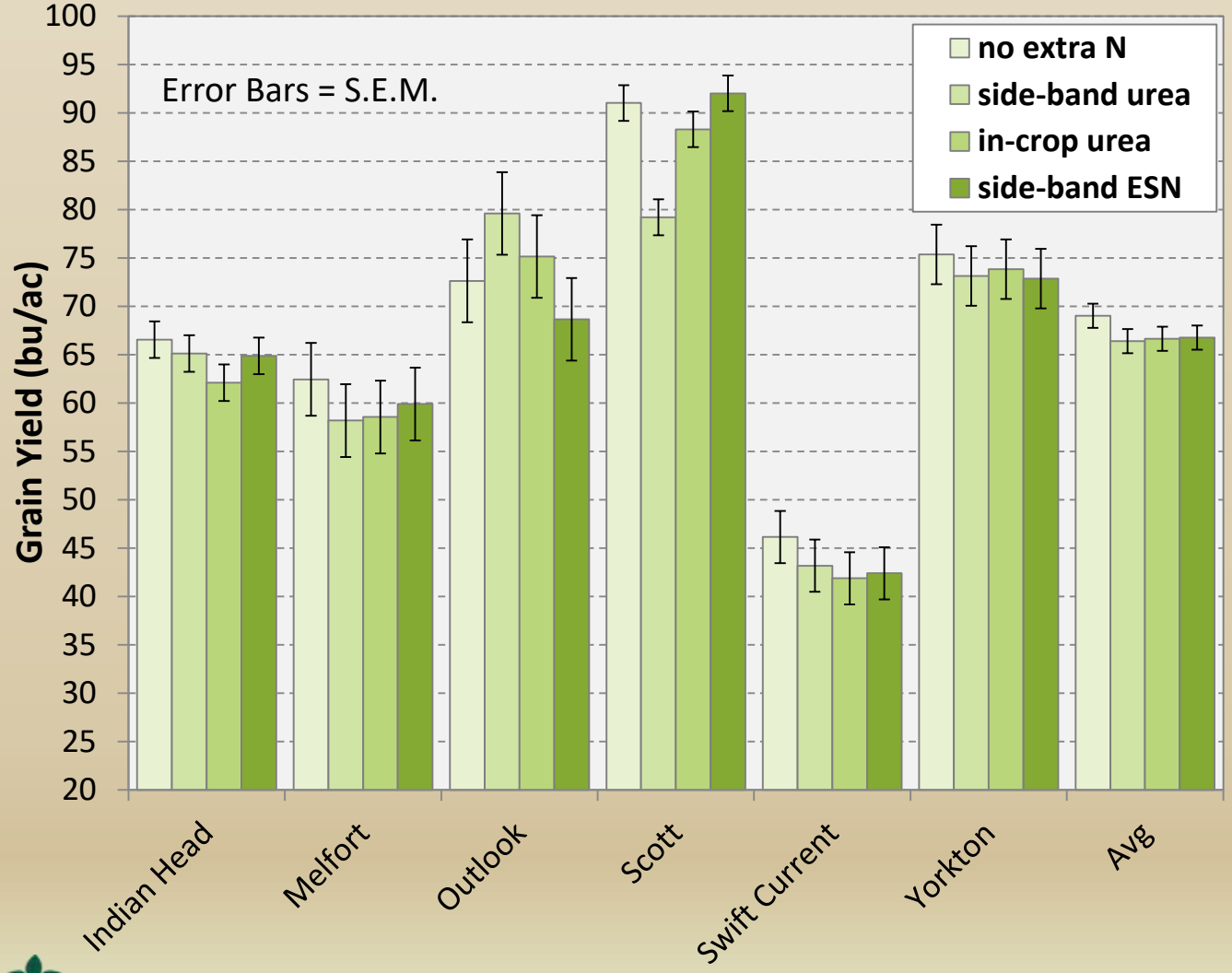
Field Pea Yield Response to Extra N by Location (2019)



LOC	No extra N vs Extra N
IH	*
ME	ns
OL	ns
SC	***
SW	ns
YK	ns
AVG	*

ns: $P > 0.10$
*: $P > 0.05 \leq 0.10$
**: $P > 0.01 \leq 0.05$
***: $P \leq 0.01$

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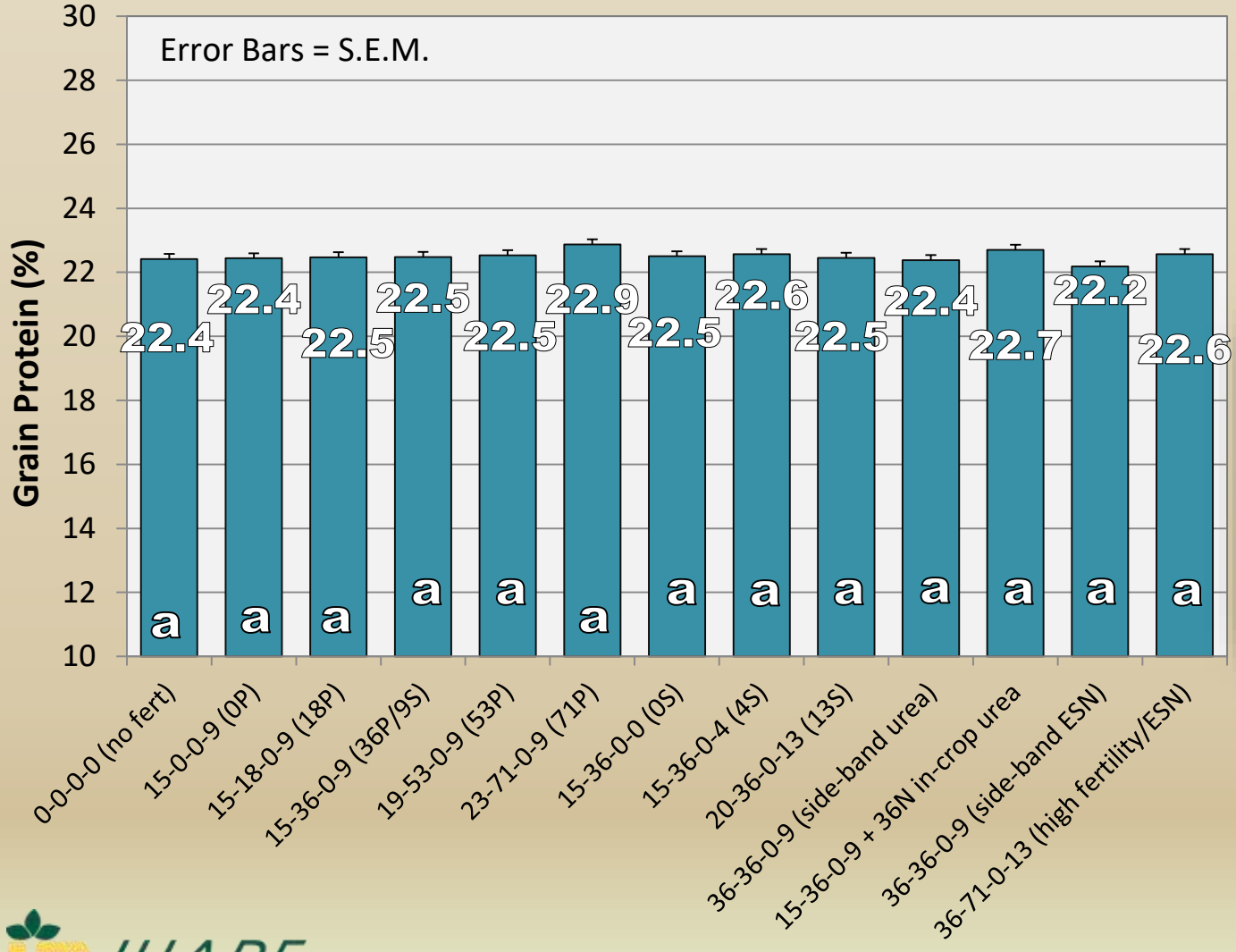
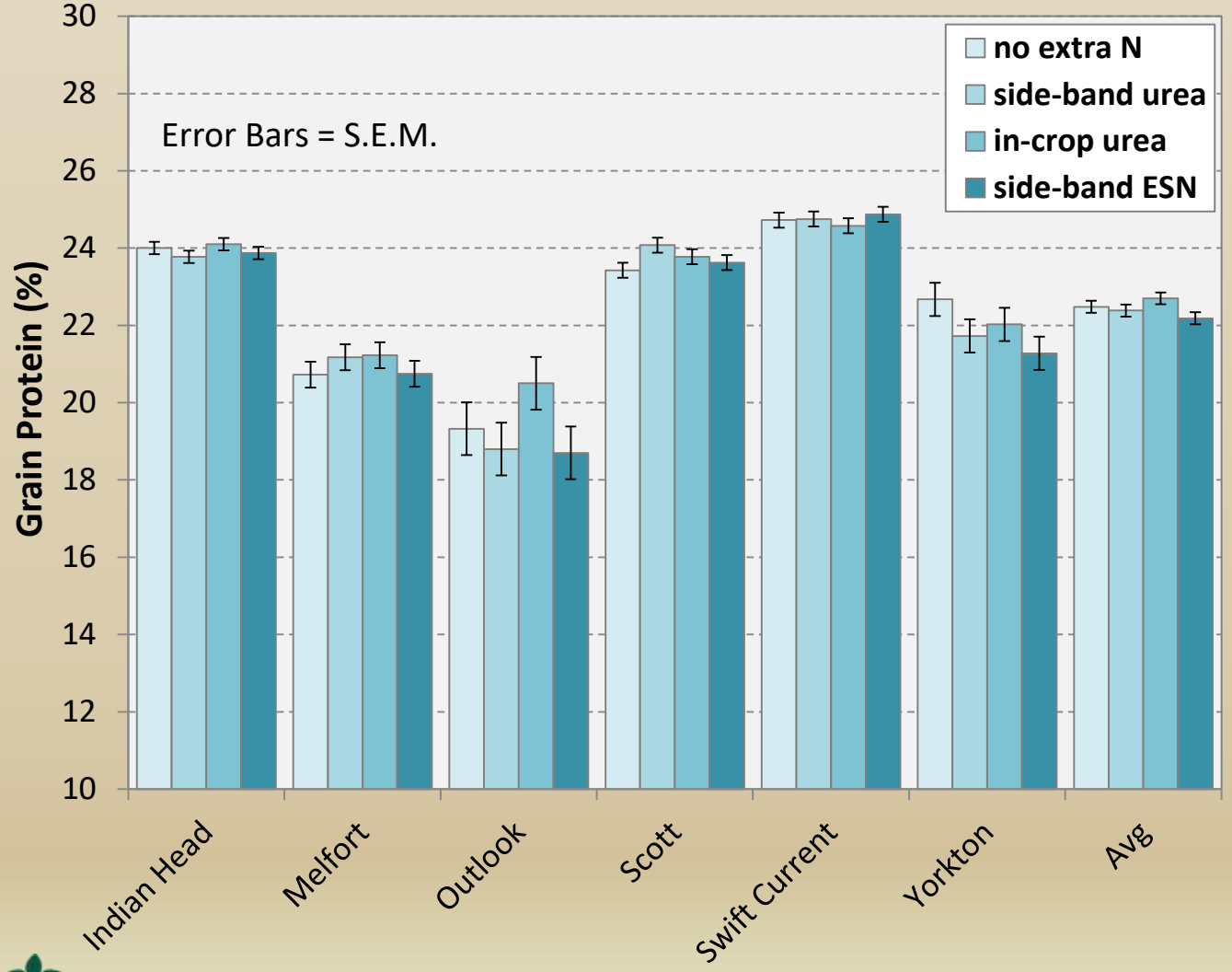
Fertility Effects on Field Pea Protein

Average of 6 Locations (2019)



Source	Pr > F
Fertility (F)	0.270
Location (L)	<0.001
F x L	<0.001

Field Pea Protein Response to Extra N by Location (2019)



LOC	No extra N vs Extra N
IH	ns
ME	ns
OL	ns
SC	**
SW	ns
YK	**
AVG	ns

ns: $P > 0.10$
*: $P > 0.05 \leq 0.10$
**: $P > 0.01 \leq 0.05$
***: $P \leq 0.01$

Dry Bean Inoculant & N Fertilizer Strategies for Solid-Seeded Production

Garry Hnatowich - ICDC

Dry Bean Inoculant & Fertilizer Treatments

Locations: Indian Head, Yorkton, Redvers, Scott, & Outlook

Inoculant Treatments

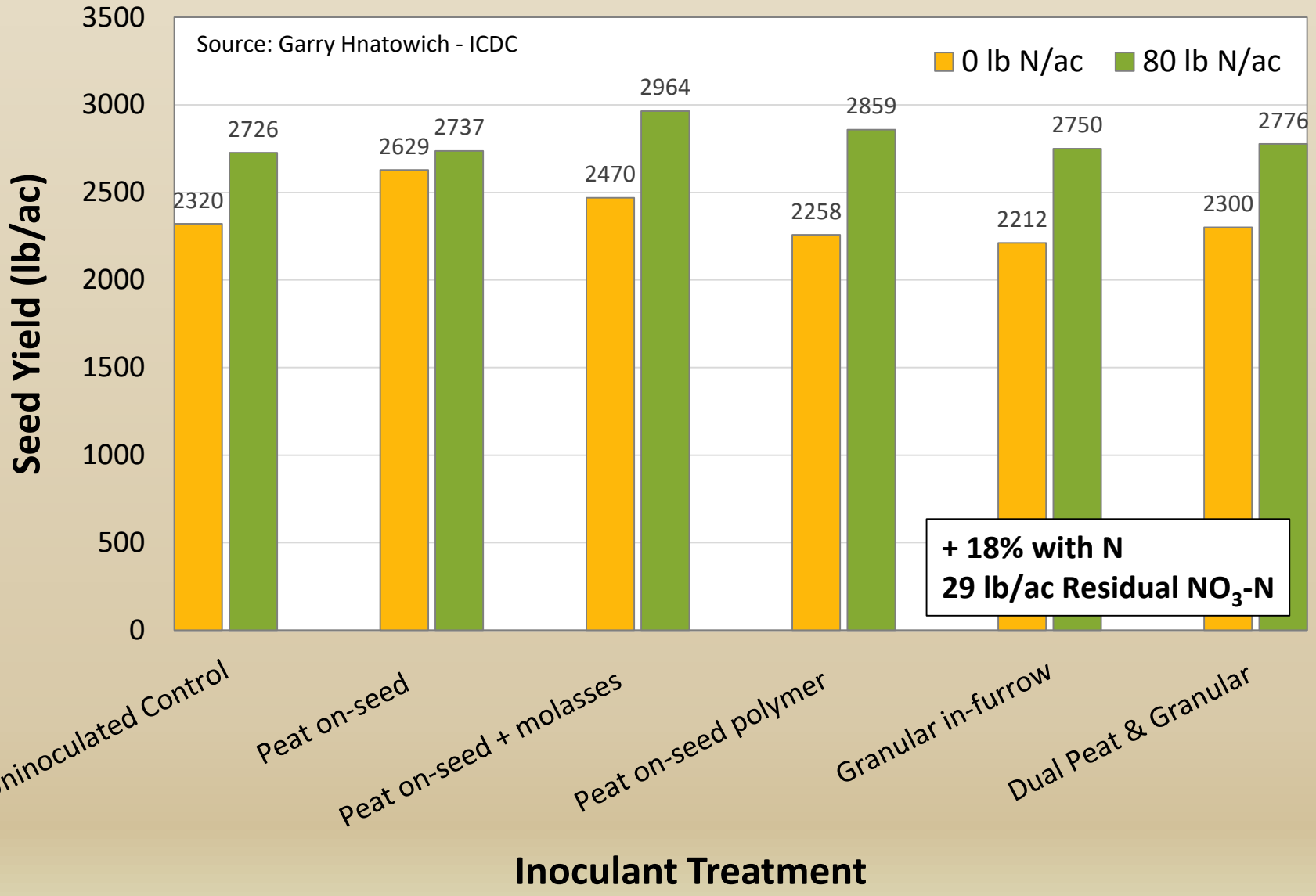
1. Control – no inoculant
2. Peat Formulation – on-seed
3. Peat Formulation – on-seed & molasses
4. Peat Formulation – on-seed polymer coated
5. Granular Formulation – in-furrow application
6. Dual Peat Formulation & Granular Formulation

- Inoculants imported courtesy of a USA manufacturer (Verdesian), facilitated by ICDC (recommended rates of each form applied)

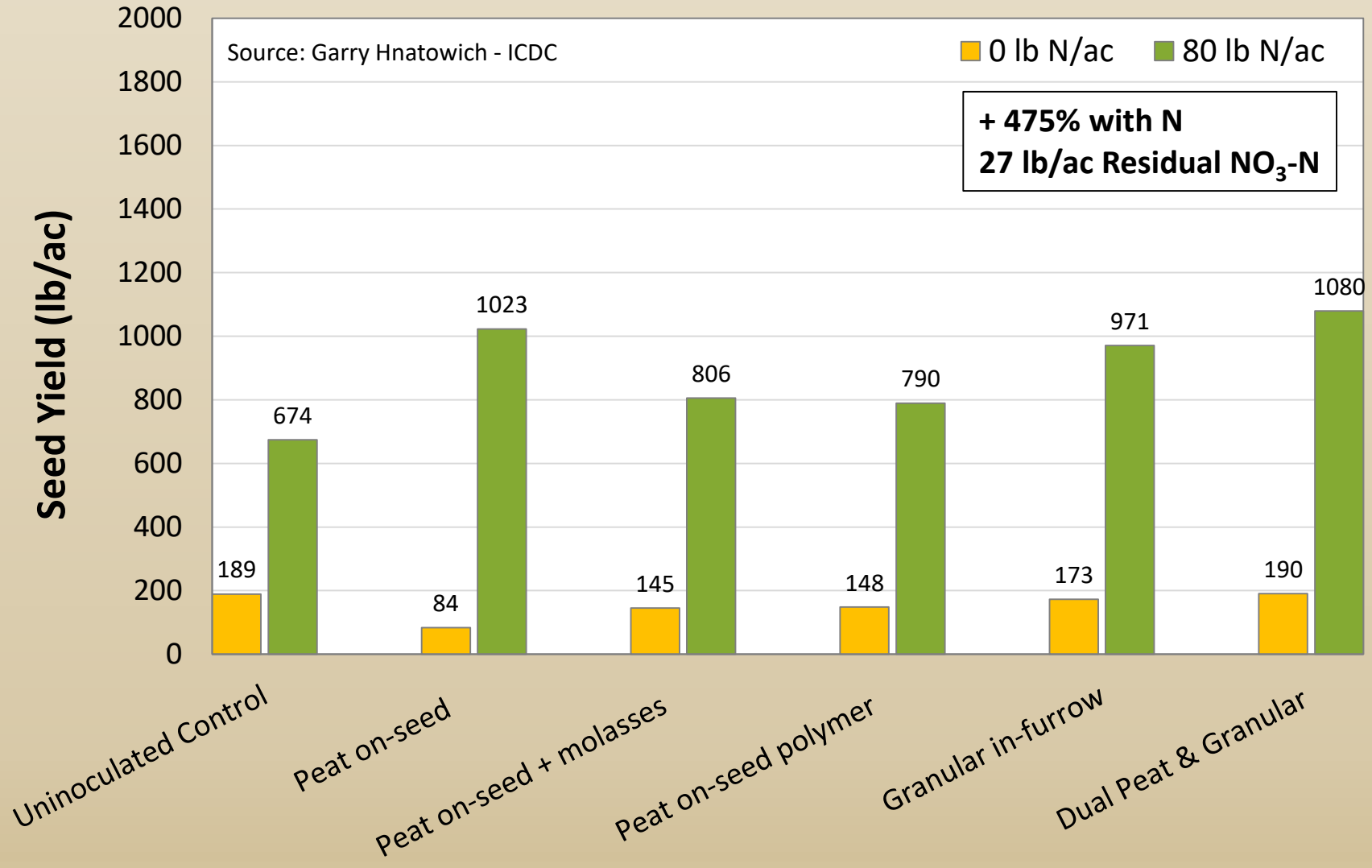
Fertilizer Applications (side banded)

1. 0 lbs N/ac
2. 80 lbs N/ac (total of soil test N [0-24”] + fertilizer N) as urea

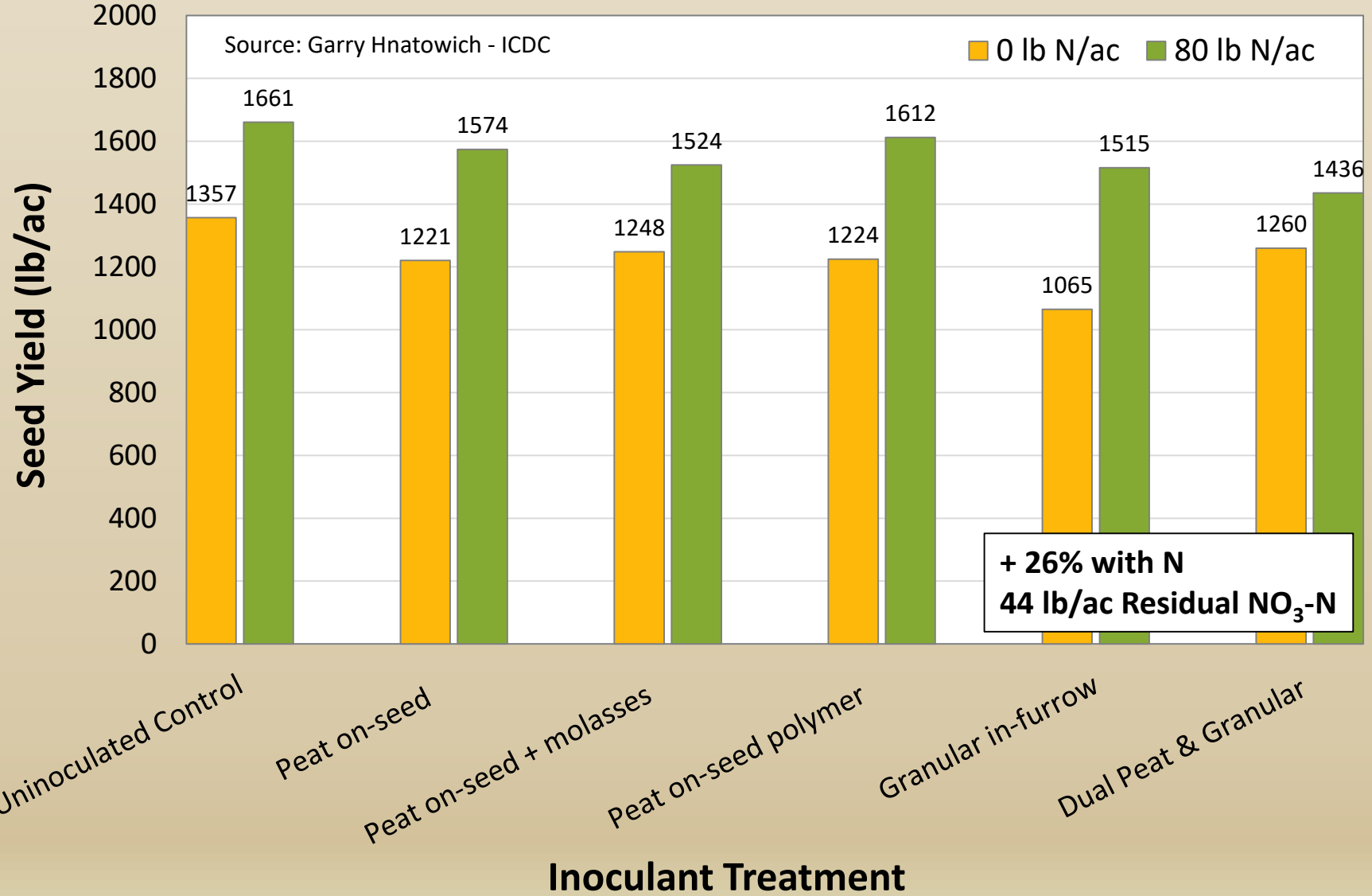
ICDC – Outlook (irrigated)



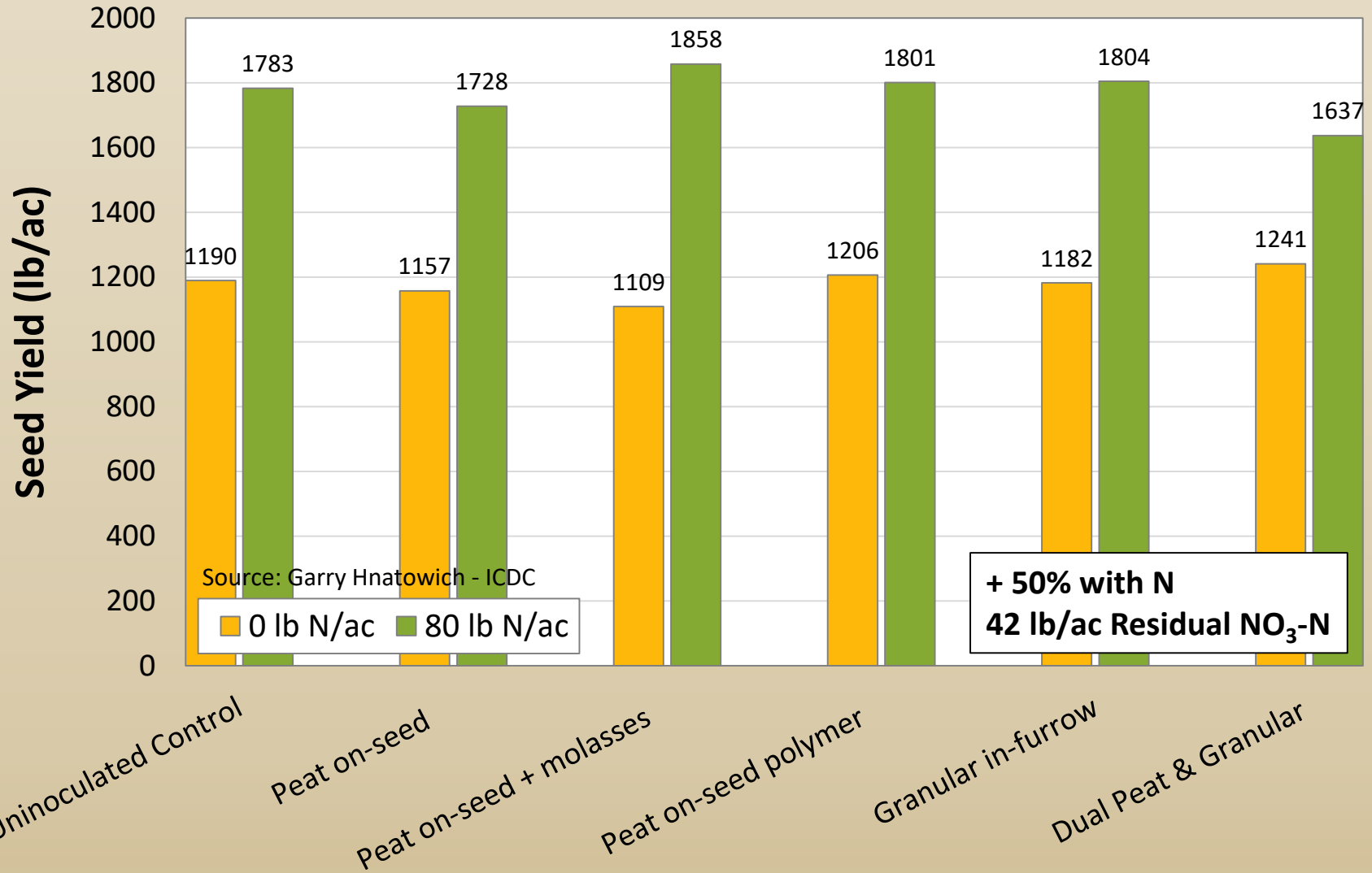
IHARF - Indian Head (dryland)



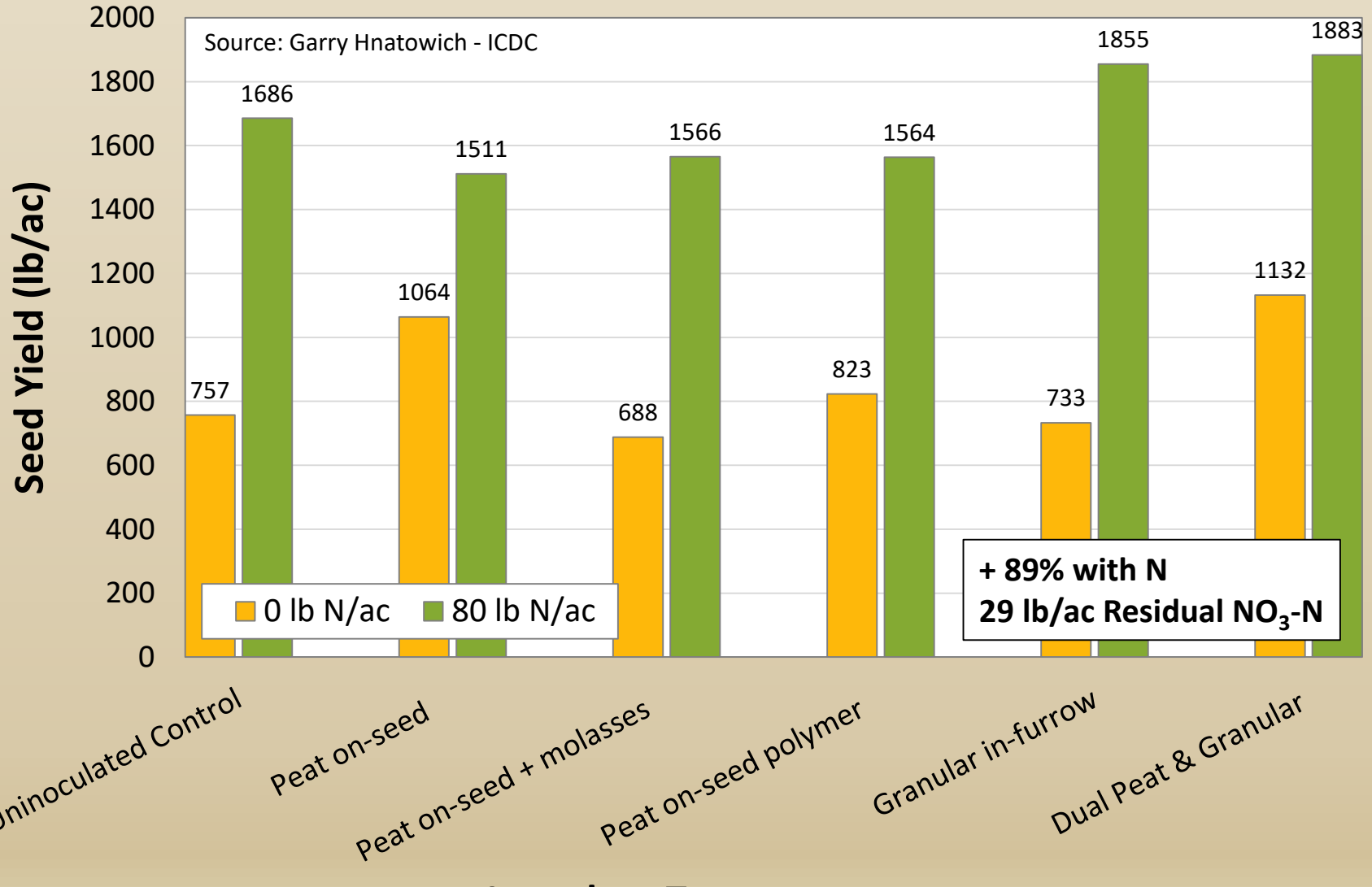
SERF – Redvers (dryland)



WARC – Scott (dryland)

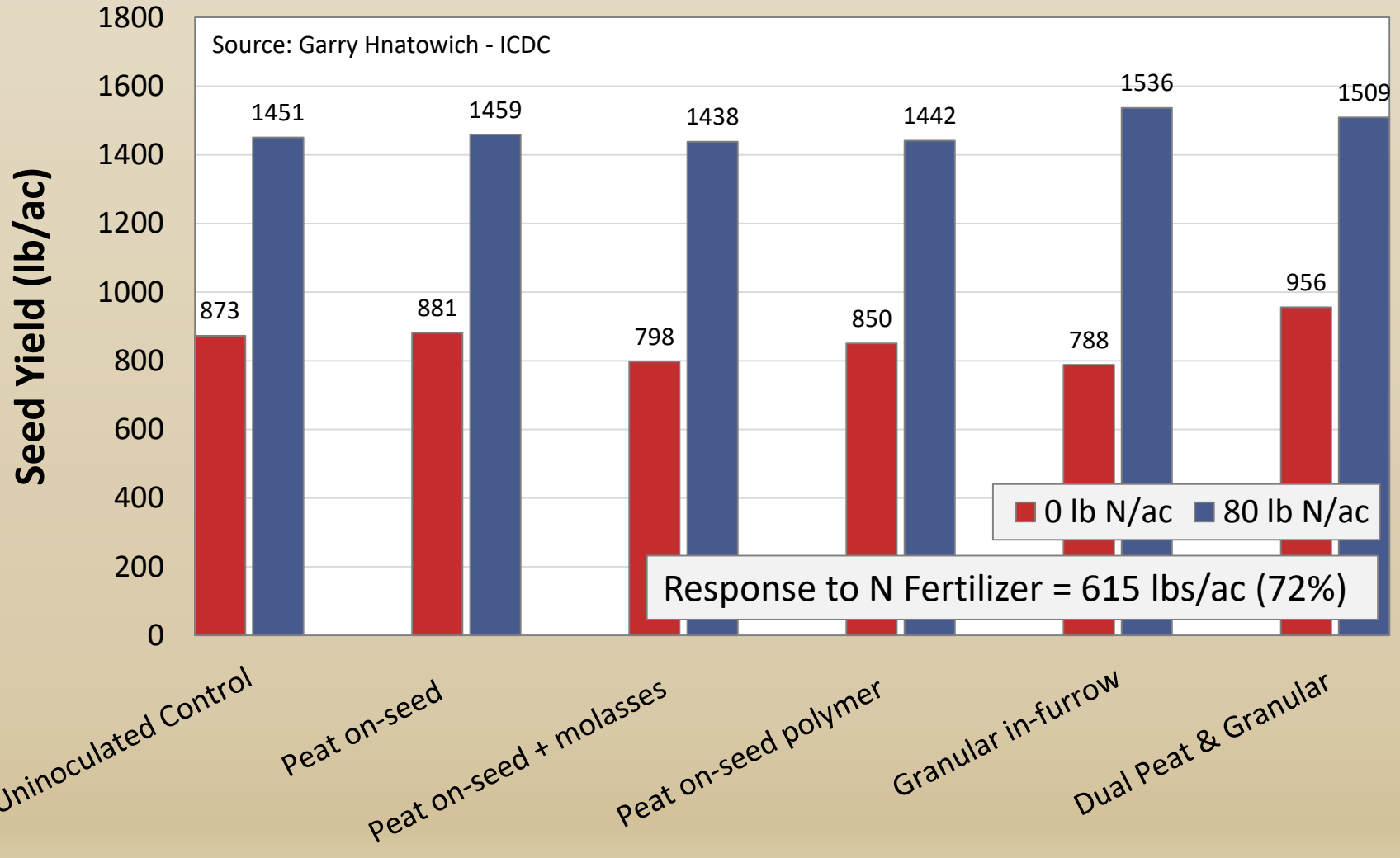


ECRF – Yorkton (dryland)



Dryland Sites

Average of 4 sites in 2019 (Indian Head, Redvers, Yorkton & Scott)



Inoculant Treatment

Wheat Response to Various Inputs Alone and in Combination (ADOPT)

ADOPT Wheat Input Demonstration

Indian Head 2018

Objectives: To demonstrate agronomic and economic responses of CWRS wheat to various crop inputs both individually and collectively

#	Name	Seed Trt (no/yes)	Seed Rate (seeds/m^2)	Fertility (lb/ac N-P_2O_5-K_2O-S)	PGR (no/yes)	Fungicide (no/yes)
1	Low Input	No	250	80-18-9-9	No	No
2	Seed Trt	Yes	250	80-18-9-9	No	No
3	Seed Rate	No	400	80-18-9-9	No	No
4	Fertility	No	250	120-36-18-18	No	No
5	PGR	No	250	80-18-9-9	Yes	No
6	Fungicide	No	250	80-18-9-9	No	Yes
7	High Input	Yes	400	120-36-18-18	Yes	Yes

ADOPT Wheat Input Demonstration

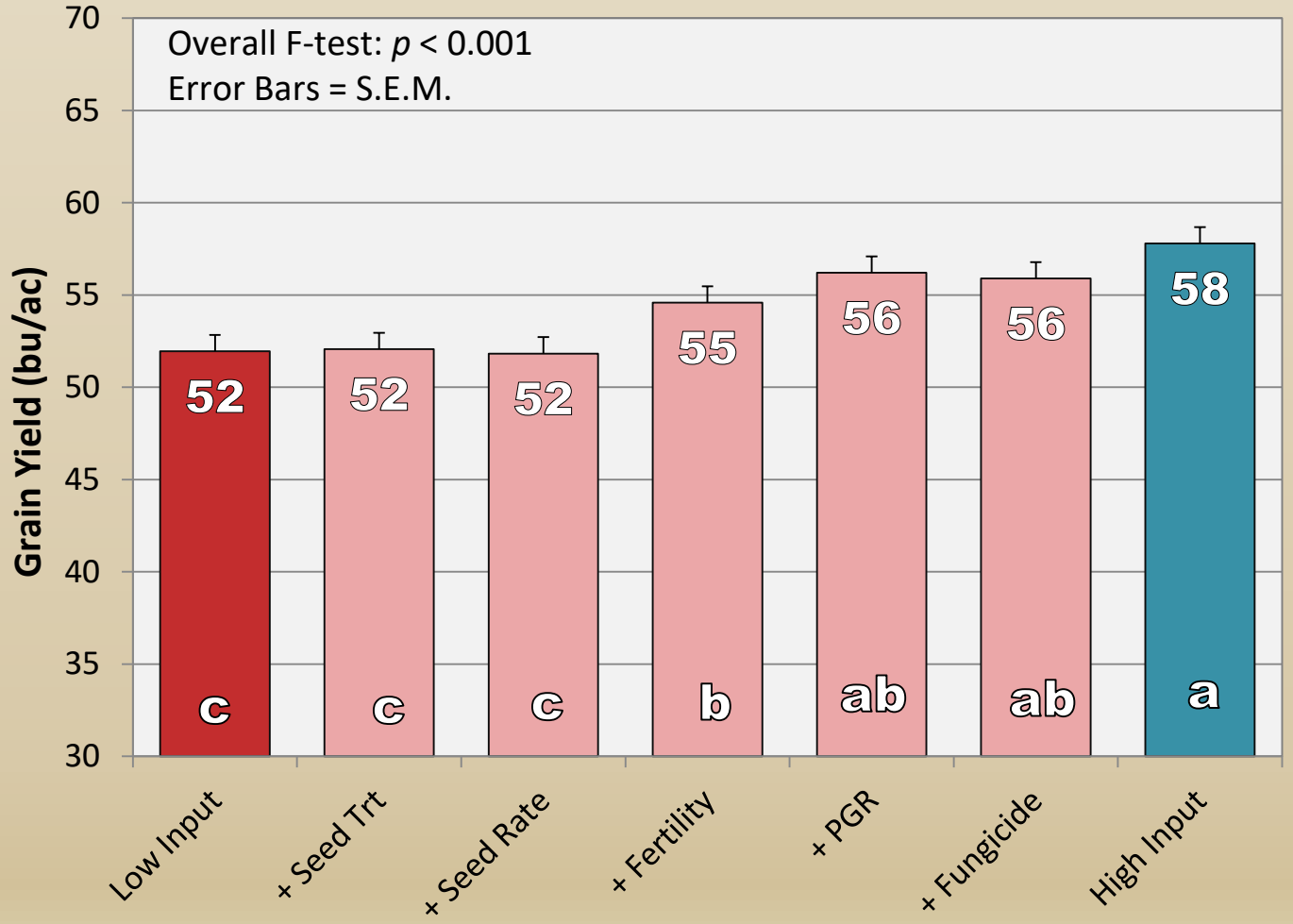
Indian Head 2019

Objectives: To build upon the results from the 2018 demonstration

#	Name	Seed Trt (no/yes)	Seed Rate (seeds/m^2)	Fertility (lb/ac N-P_2O_5-K_2O-S)	PGR (no/yes)	Fungicide (no/yes)
1	Low Input	No	250	80-18-9-9	No	No
2	+ Seed Trt	Yes	250	80-18-9-9	No	No
3	+ Seed Rate	No	400	80-18-9-9	No	No
4	+ Fertility	No	250	120-36-18-18	No	No
5	+ PGR	No	250	80-18-9-9	Yes	No
6	+ Fungicide	No	250	80-18-9-9	No	Yes
7	- Seed Trt	No	400	120-36-18-18	Yes	Yes
8	- Seed Rate	Yes	250	120-36-18-18	Yes	Yes
9	- Fertility	Yes	400	80-18-9-9	Yes	Yes
10	- PGR	Yes	400	120-36-18-18	No	Yes
11	- Fungicide	Yes	400	120-36-18-18	Yes	No
12	High Input	Yes	400	120-36-18-18	Yes	Yes

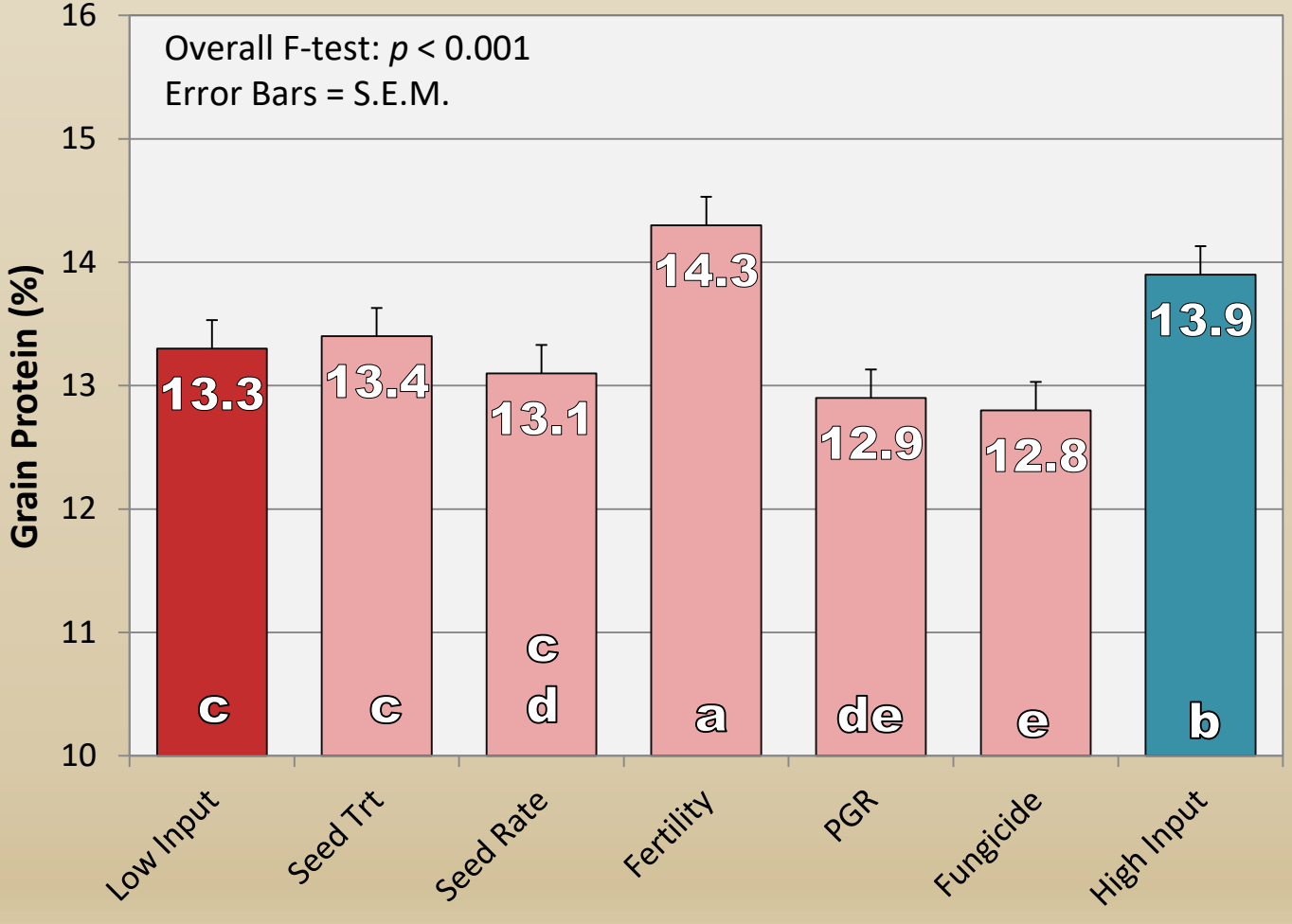
Input Effects on Wheat Yield

Indian Head 2018



Input Effects on Wheat Protein

Indian Head 2018



Input Effects on Marginal Profits

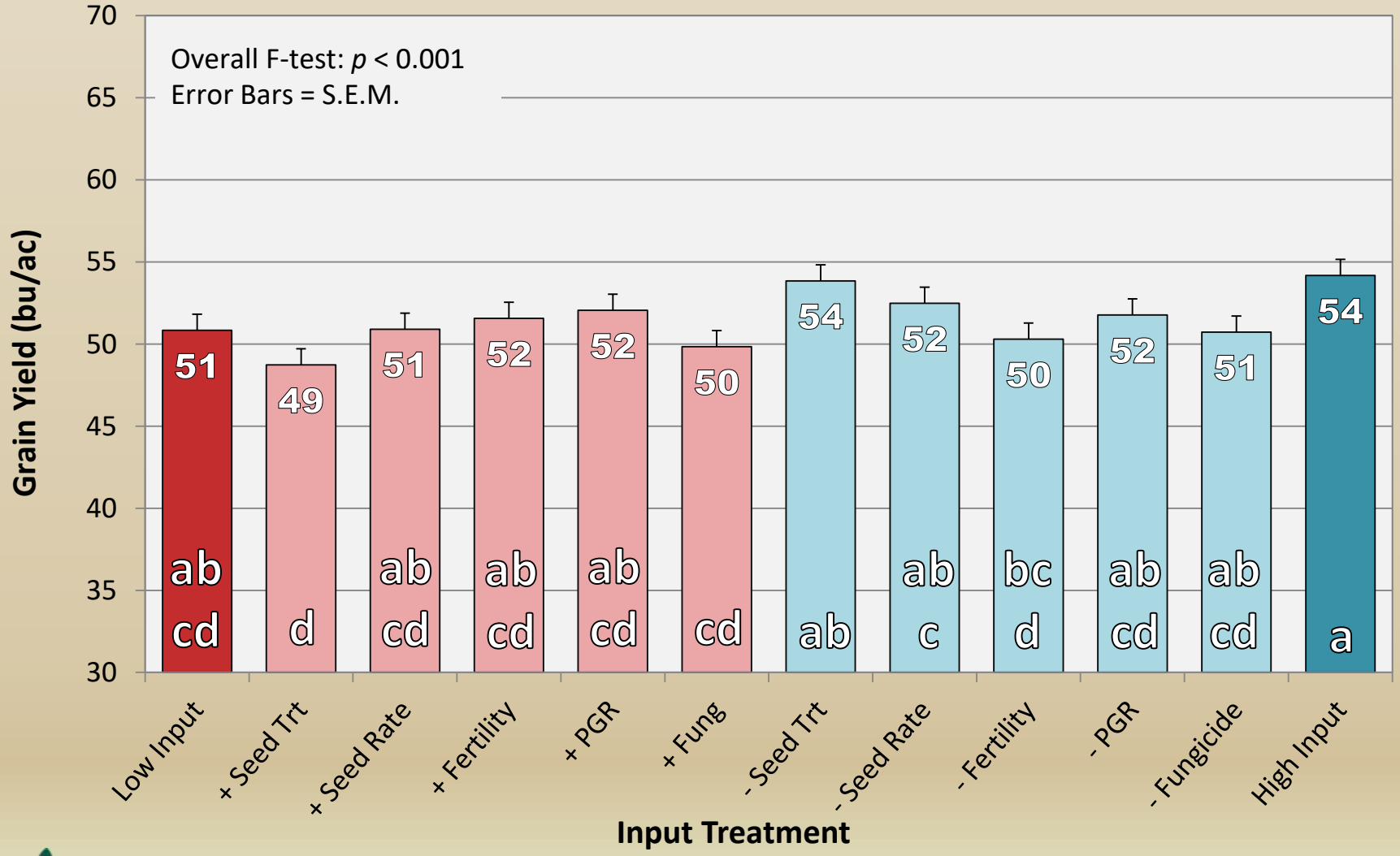
Indian Head 2018 ($/ha)

Trt #	Seed Trt [Z]	Seed Rate[Y]	Fertility[X]	PGR[W]	Fungicide[W]	Revenue[V]	Profit[U]
	$/ha						
Low Input	$0.00	$40.56	$126.04	$0.00	$0.00	$900.09	$733.49
Seed Treatment	$15.62	$40.56	$126.04	$0.00	$0.00	$902.06	$719.84
Higher Seed Rate	$0.00	$66.33	$126.04	$0.00	$0.00	$898.06	$705.69
Higher Fertility	$0.00	$40.56	$201.85	$0.00	$0.00	$945.68	$703.27
PGR	$0.00	$40.56	$126.04	$46.95	$0.00	$973.75	**$760.20**
Fungicide	$0.00	$40.56	$126.04	$0.00	$62.34	$968.50	**$739.56**
High Input	$15.62	$66.33	$201.85	$46.95	$62.34	$1,001.27	**$608.18**

[Z] Not adjusted for differences in seeding rate between Trt. 2 and 7
[Y] Assumes certified seed price of $0.478/kg
[X] Assumes $725/tonne for MAP and $525/tonne for urea
[W] Includes SRP of products plus $12.36/ha application cost
[V] Based on actual yields and a CWRS wheat price of $257/Mt ($7/bu) regardless of protein or other quality attributes
[U] Values do not take into account all production costs and are only estimates – actual input costs & revenues may vary widely

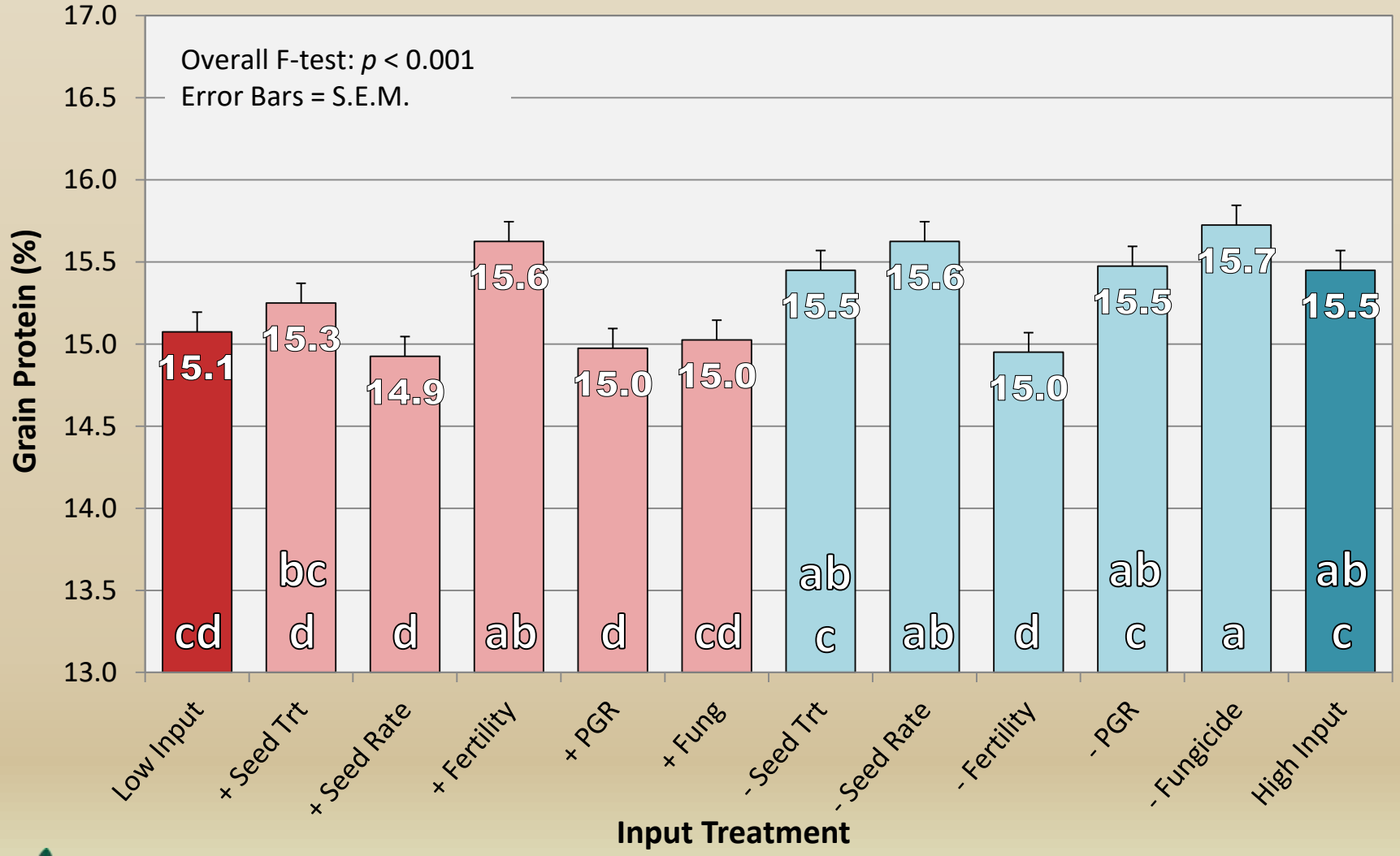
Input Effects on Wheat Yield

Indian Head 2019



Input Effects on Wheat Protein

Indian Head 2019



Input Effects on Marginal Profits

Indian Head 2019 ($/ha)

Trt #	Seed Trt	Seed Rate	Fertility	PGR	Fungicide	Revenue	Profit
	---------- $/ha ----------						
Low Input	$0.00	$40.56	$126.04	$0.00	$0.00	$880.74	**$714.14**
Low + Seed Trt	$15.62	$40.56	$126.04	$0.00	$0.00	$844.25	$662.03
Low + Seed Rate	$0.00	$66.33	$126.04	$0.00	$0.00	$882.02	$689.65
Low + Fertility	$0.00	$40.56	$201.85	$0.00	$0.00	$893.33	$650.92
Low + PGR	$0.00	$40.56	$126.04	$46.95	$0.00	$901.81	$688.26
Low + Fung	$0.00	$40.56	$126.04	$0.00	$62.34	$863.52	$634.58
High - Seed Trt	$0.00	$66.33	$201.85	$46.95	$62.34	$932.91	**$555.44**
High - Seed Rate	$15.62	$40.56	$201.85	$46.95	$62.34	$909.27	**$541.95**
High - Fertility	$15.62	$66.33	$126.04	$46.95	$62.34	$871.49	**$554.21**
High - PGR	$15.62	$66.33	$201.85	$0.00	$62.34	$896.93	**$550.79**
High - Fung	$15.62	$66.33	$201.85	$46.95	$0.00	$878.94	**$548.19**
High Input	$15.62	$66.33	$201.85	$46.95	$62.34	$938.56	**$545.47**

Pre-Harvest Options for Straight-Combined Canola (SCDC-MCGA)

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Evaluation of Pre-Harvest Options for Straight-Combined Canola

Locations: Indian Head, Melita, Melfort, and Scott (2017-2019)

Treatment Descriptions	
1) LL – untreated	6) RR – untreated
2) LL – glyphosate (890 g ai/ha) [Z]	7) RR – gluf. ammonium (408 g ai/ha) [YX]
3) LL – saflufenacil (50 g ai/ha) [Z]	8) RR – saflufenacil (50 g ai/ha) [Z]
4) LL – glyphosate (890 g ai/ha) + saflufenacil (50 g ai/ha) [Z]	9) RR - glyphosate (890 g ai/ha) + saflufenacil (50 g ai/ha) [Z]
5) LL – diquat (40 g ai/ha) [Y]	10) RR – diquat (40 g ai/ha) [Y]

LL – glufosinate ammonium tolerant; RR – glyphosate tolerant

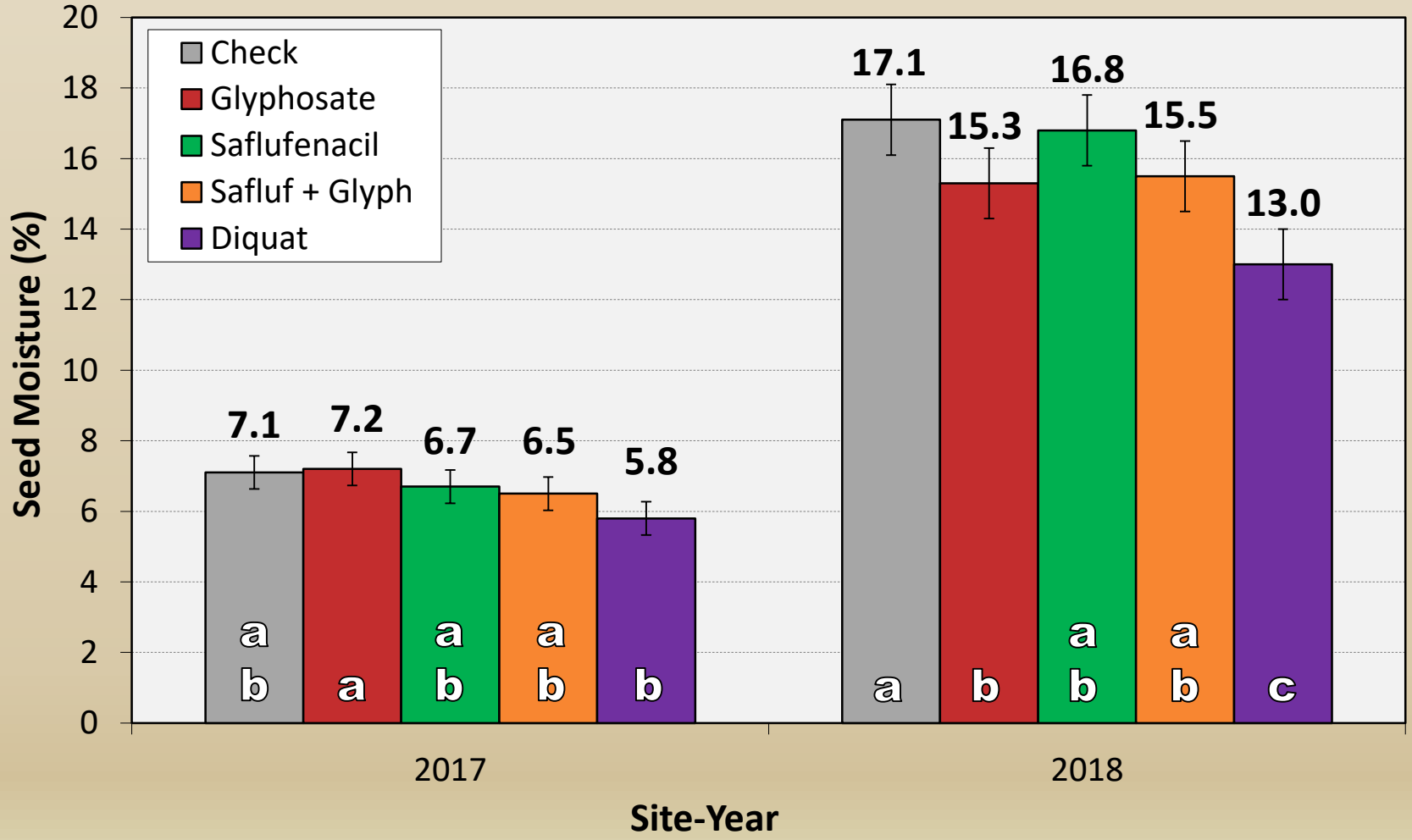
[Z] applied at 60-75% seed colour change; [Y] applied at 90% seed colour change

[X] not a registered option for pre-harvest applications on canola

Data Collected: Visual stem dry-down ratings, whole plant and seed moisture at harvest, seed size, percent green seed, yield

NOTE: Only Indian Head results presented for brevity, all results considered preliminary at this time

Pre-Harvest Application Effects on Seed Moisture at Indian Head – LL Canola



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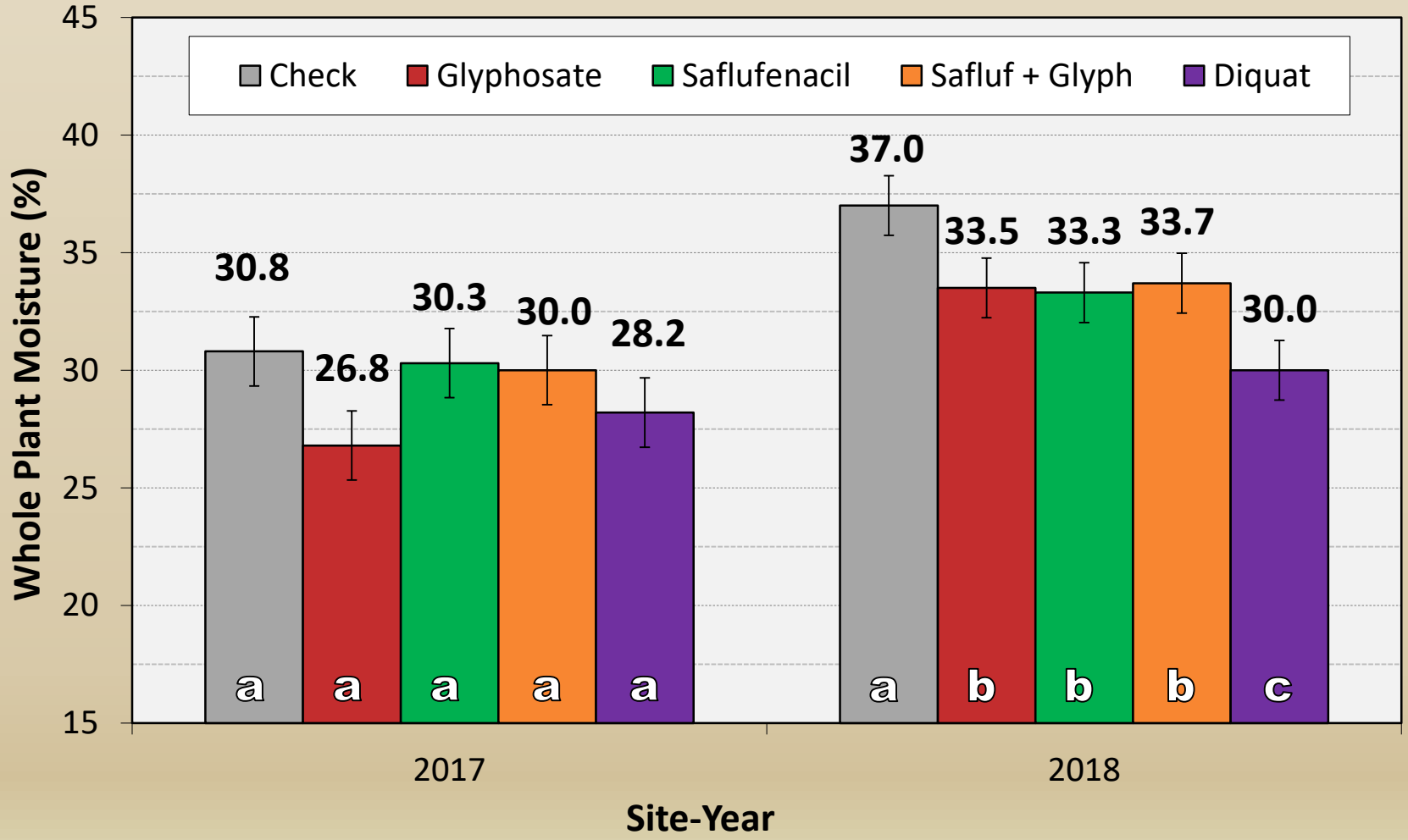
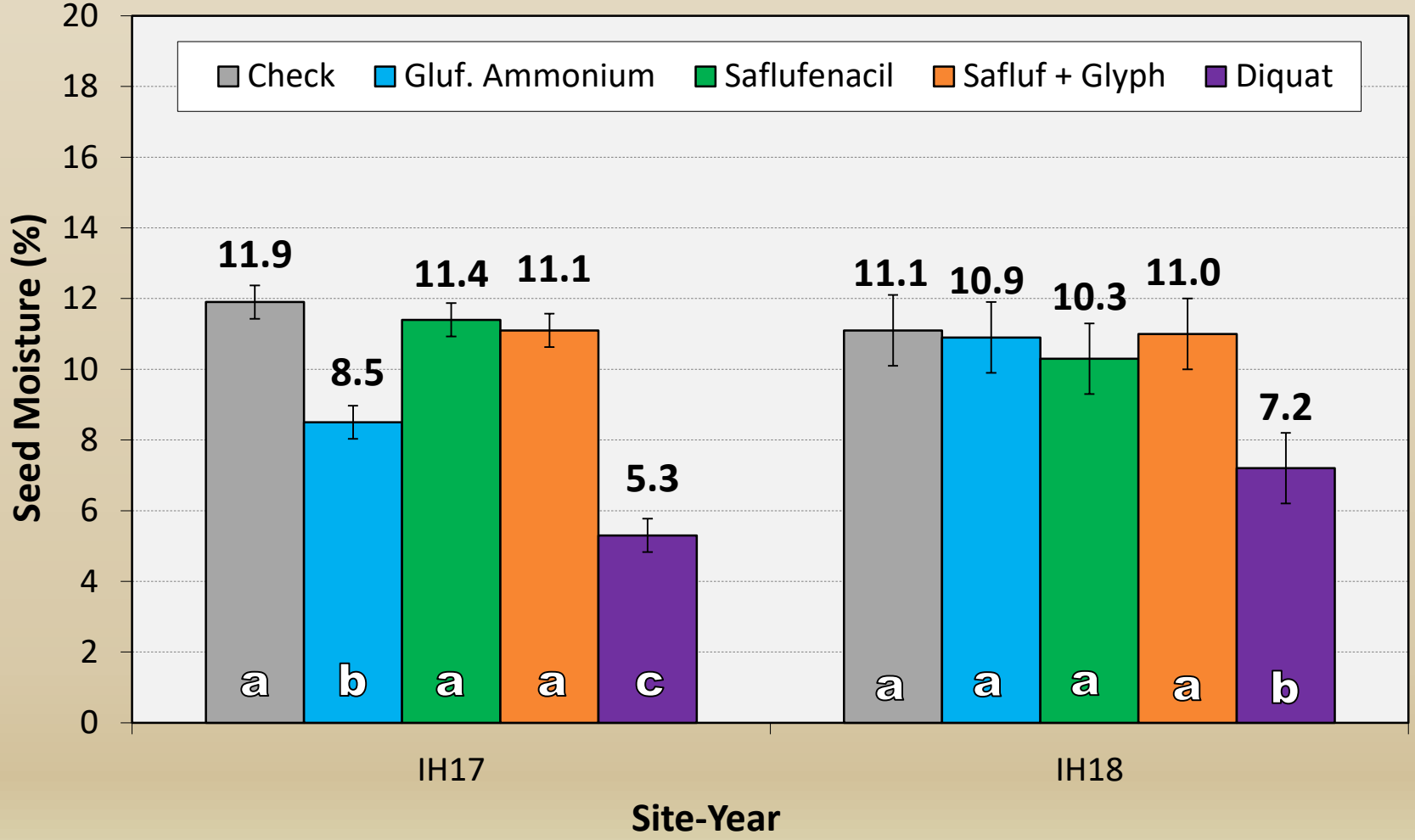
Pre-Harvest Application Effects on Plant Moisture at Indian Head – LL Canola



Pre-Harvest Application Effects on Seed Moisture at Indian Head – RR Canola



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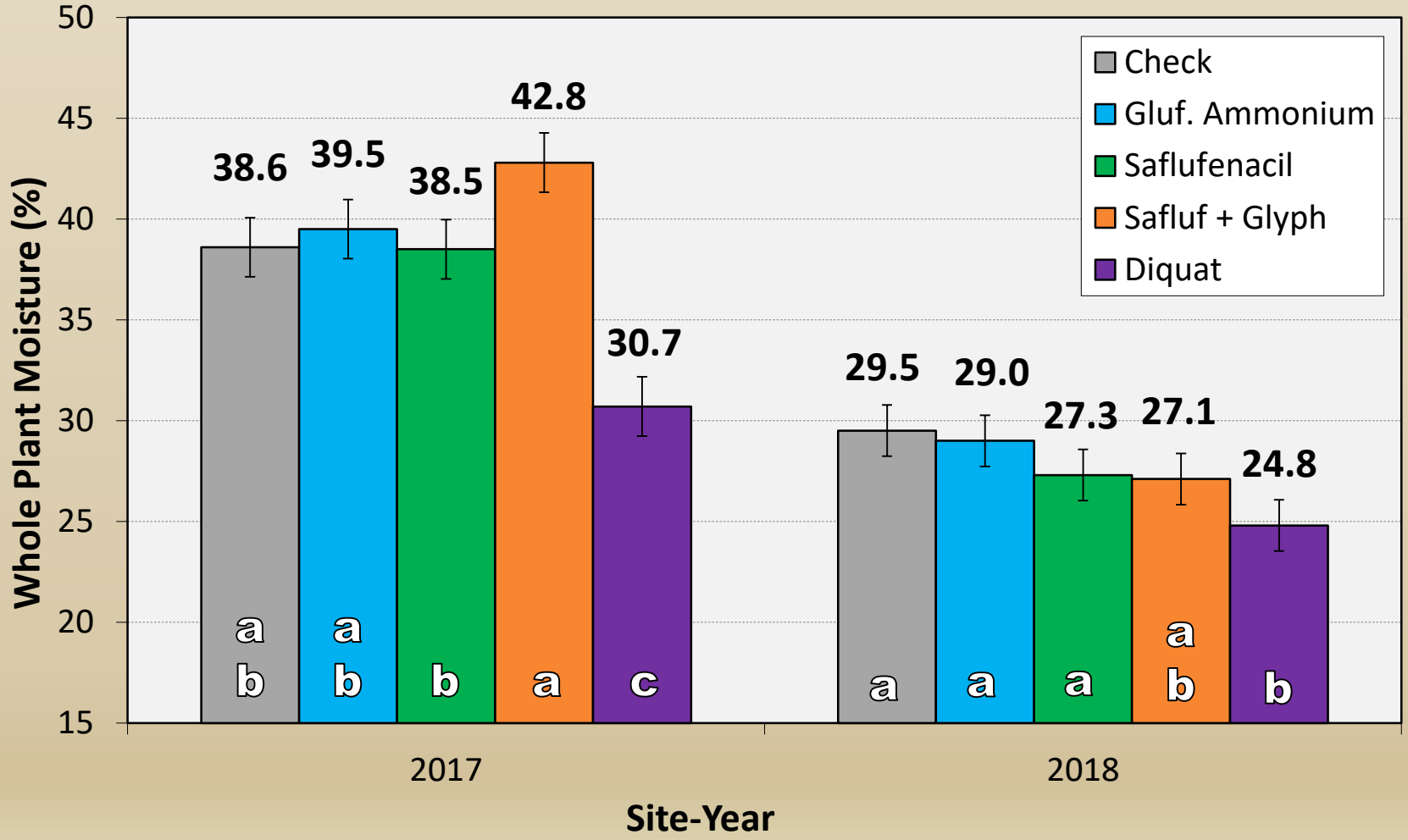
Pre-Harvest Application Effects on Plant Moisture at Indian Head – RR Canola



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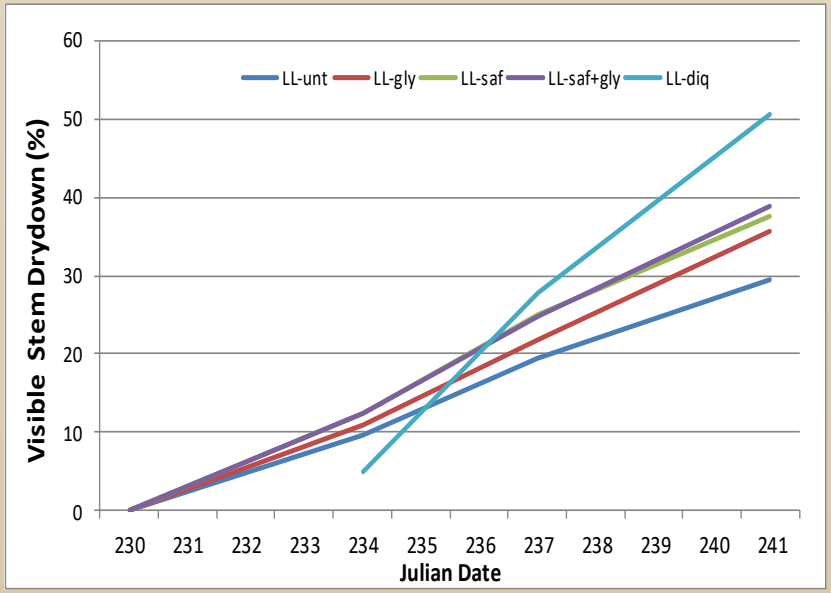
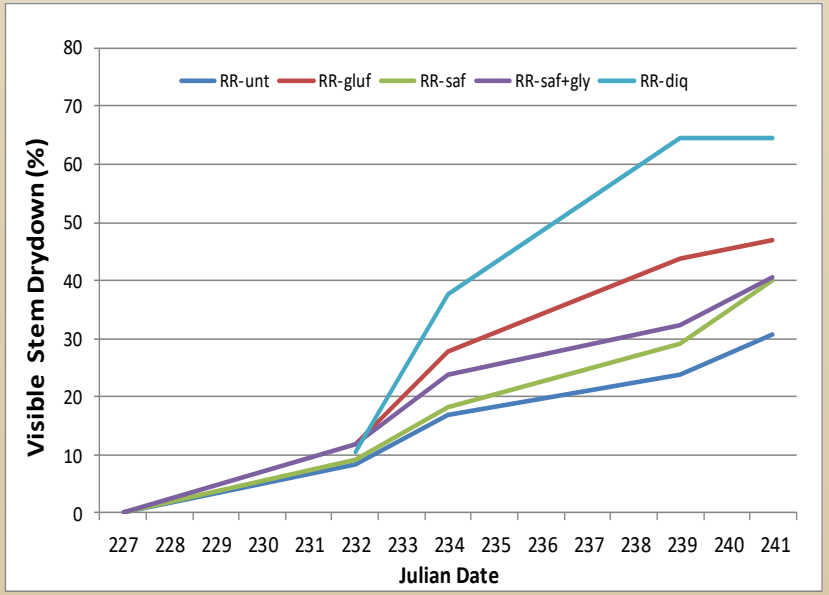
Rates of Visual Stem Dry-down as Affected by Pre-harvest Applications

Examples from Indian Head 2018



Gluf. Ammonium Tolerant Canola



Glyphosate Tolerant Canola

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THANK YOU

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SAVE THE DATE!!!

IHARF Annual Field Day, Tuesday July 21