IHARF

INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

2014 Agronomy Update

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IHARF Soil & Crop Management Seminar
February 4, 2014
White City, SK

IHARF Sources of Funding

- Grain revenues from approximately 1200 ac of cropland and in-kind donations comprise up to 50% of gross operating funds
- Approximately 40-50 research & demonstration projects funded annually by a combination of government (provincial & federal), producer groups & private industry

Source	% of Outside Funding (Cash & In-Kind)					
	2010	2011	2012	2013	2014	AVG
Industry	49%	30%	36%	33%	17%	**33%**
Producer	36%	48%	45%	24%	28%	**36%**
Government	15%	22%	19%	43%	55%	**31%**

Winter Wheat 2014 Update

Seeding Rates, Treatments, Fungicides & Nitrogen

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INDIAN HEAD AGRICULTURAL RESEARCH FOUNDATION

Canada

Ducks Unlimited Canada
Conserving Canada's Wetlands

IHARF Soil & Crop Management Seminar
Feb. 4, 2015, White City, Saskatchewan

Growing Season Conditions

Winter Wheat Factor	Indian Head 2012 / 2013	Indian Head 2013 / 2014	Scott 2013 / 2014
Seeding Date	- Sept. 15 (avg)	- Sept. 23 (late)	- Sept. 11 (avg)
Conditions at Planting	- extremely dry	- adequate soil moisture	- adequate soil moisture
Time of Emergence	- the next spring	- later that fall	- later that fall
Spring Stand	- poor / variable	- good / excellent	- good / excellent
Spring/Summer Moisture	- dry then optimal	- optimal to excessive	- optimal
Disease Pressure	- moderate / high	- moderate / high	- moderate / high
Yield Potential	- variable but very high in some cases	- average / above-average	- average / above-average
Maturity	- just earlier to later than spring wheat	- 7-10 days earlier than spring wheat	- 2 weeks earlier than spring wheat

Seeding Rates & Treatments

Indian Head (2013-14) and Scott (2014)

Seeding Rates

1. 200 seeds m^{-2}
2. 300[Z] seeds m^{-2}
3. 400 seeds m^{-2}

[Z]2013-14 only

Seed Treatments

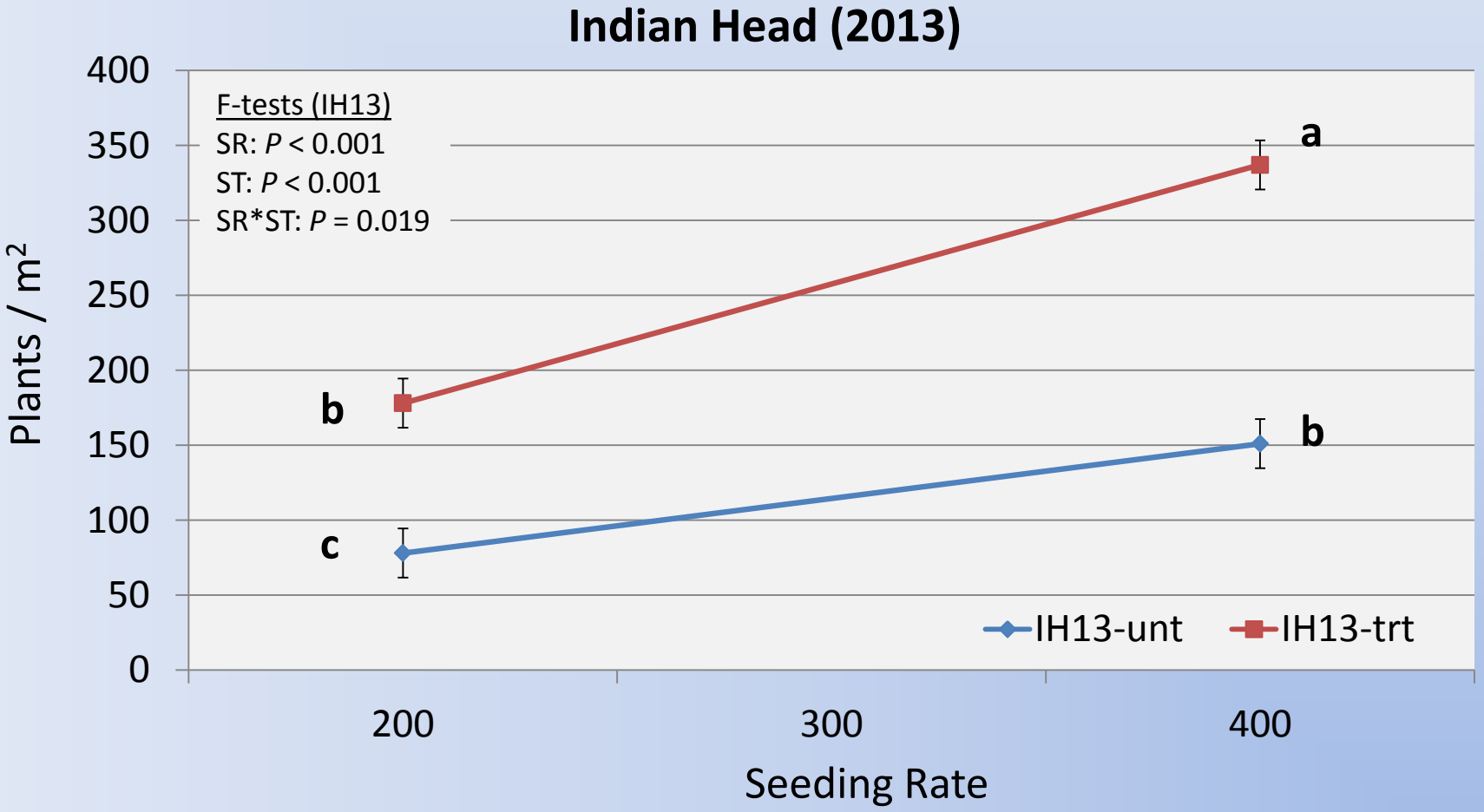
1. Untreated
2. Treated (Raxil Pro)

Fungicide (2014 only)

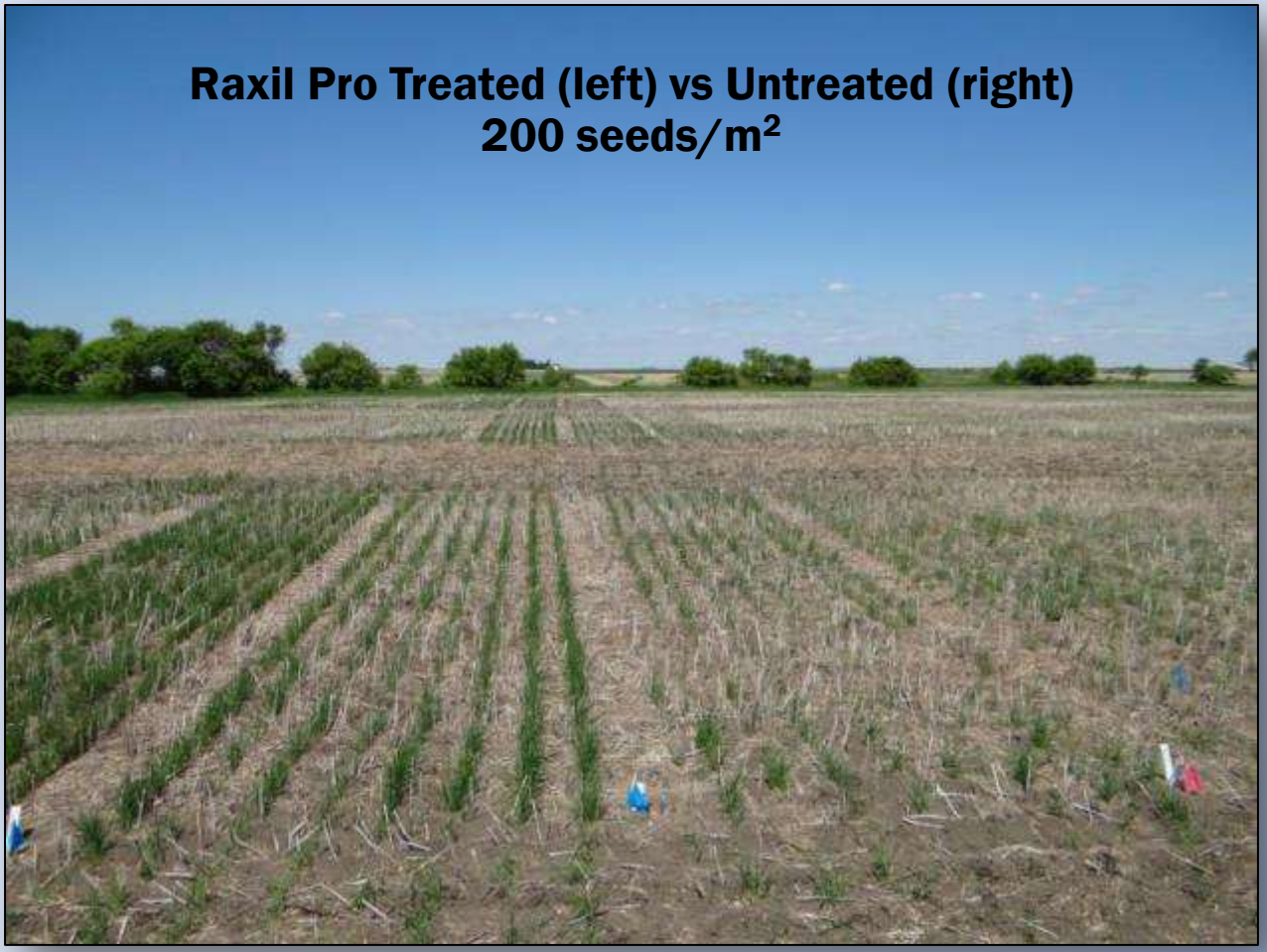
1. Untreated
2. Treated (Twinline @ flag + Prosaro @ anthesis)

Seeding Rates & Treatments

Effects on Winter Wheat Establishment

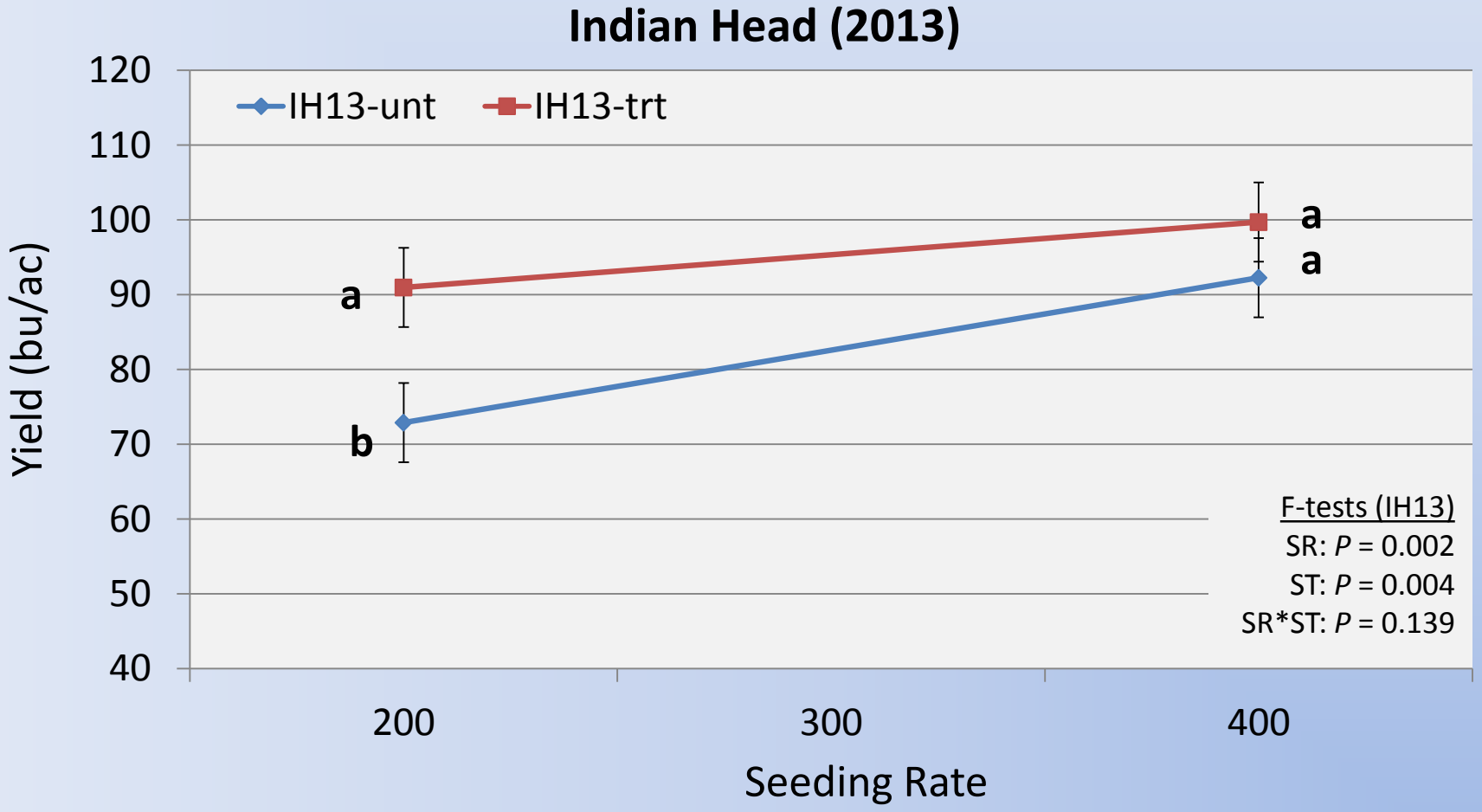


Seed Treatment Effects
June 12, 2013 (Indian Head)



Seeding Rates & Treatments

Effects on Winter Wheat Grain Yield



Seed Treatment Effects

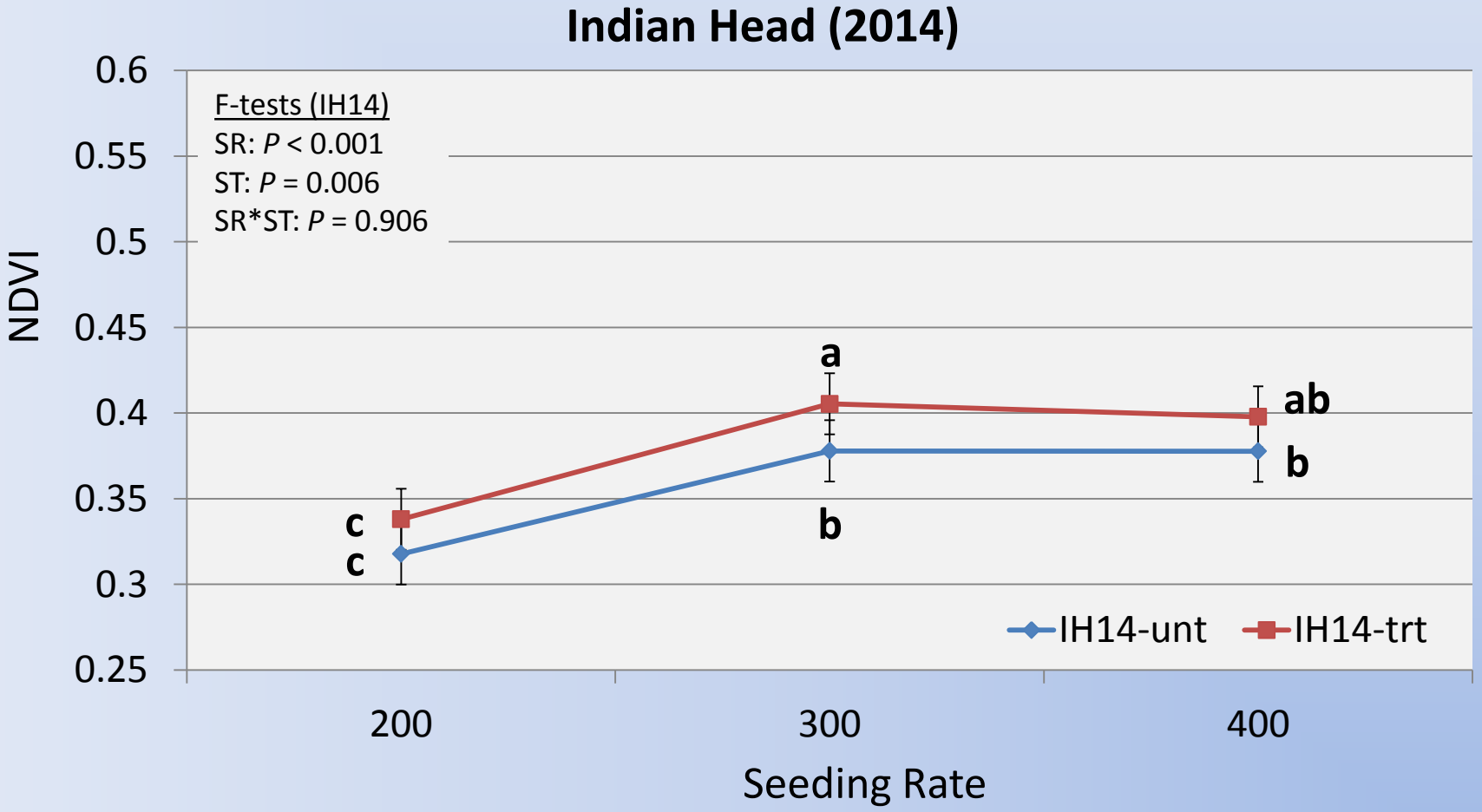
August 2, 2013 (Indian Head)

200 seeds/m^2 – untreated seed

200 seeds/m^2 – treated seed

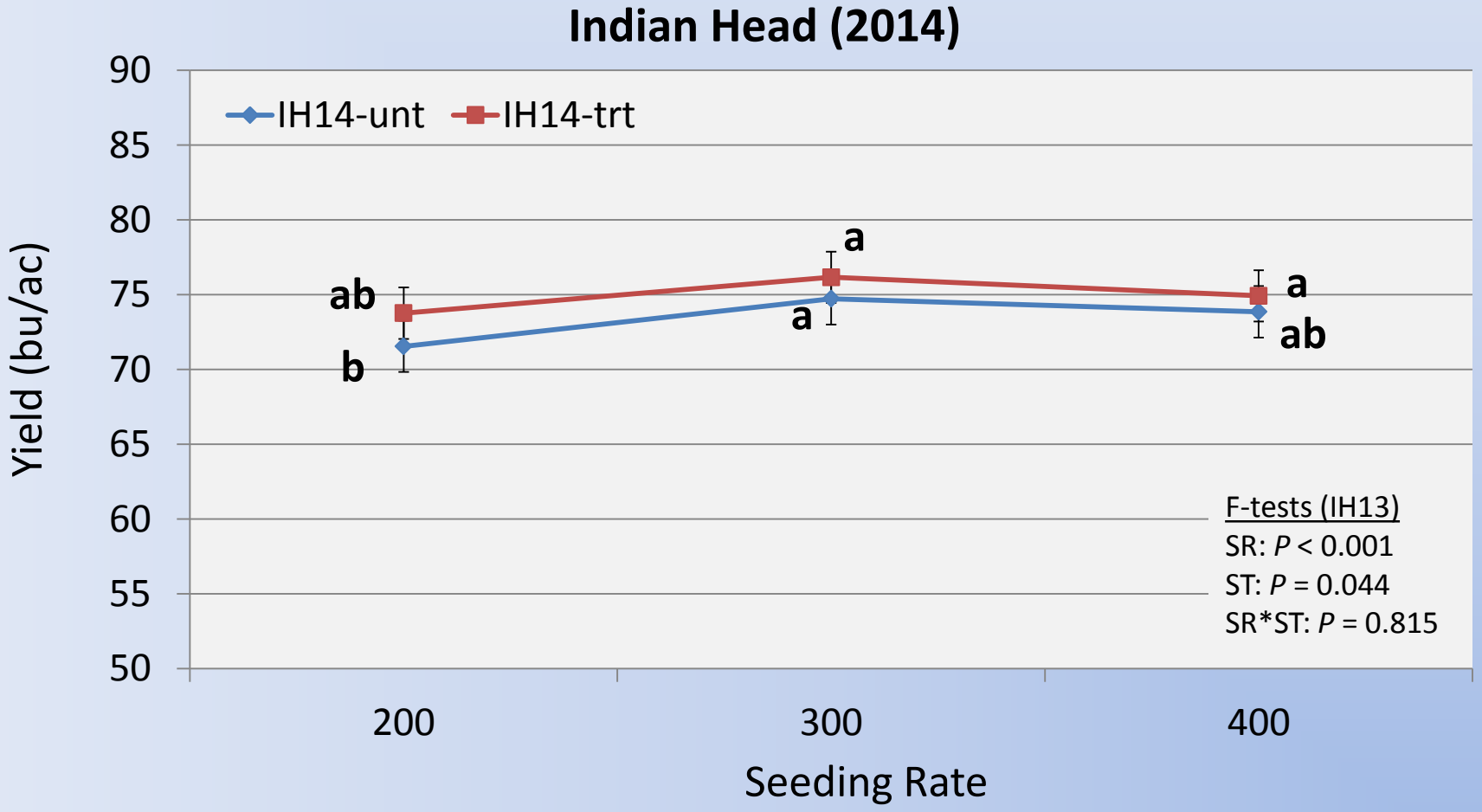
Seeding Rates & Treatments

Effects on Winter Wheat Establishment

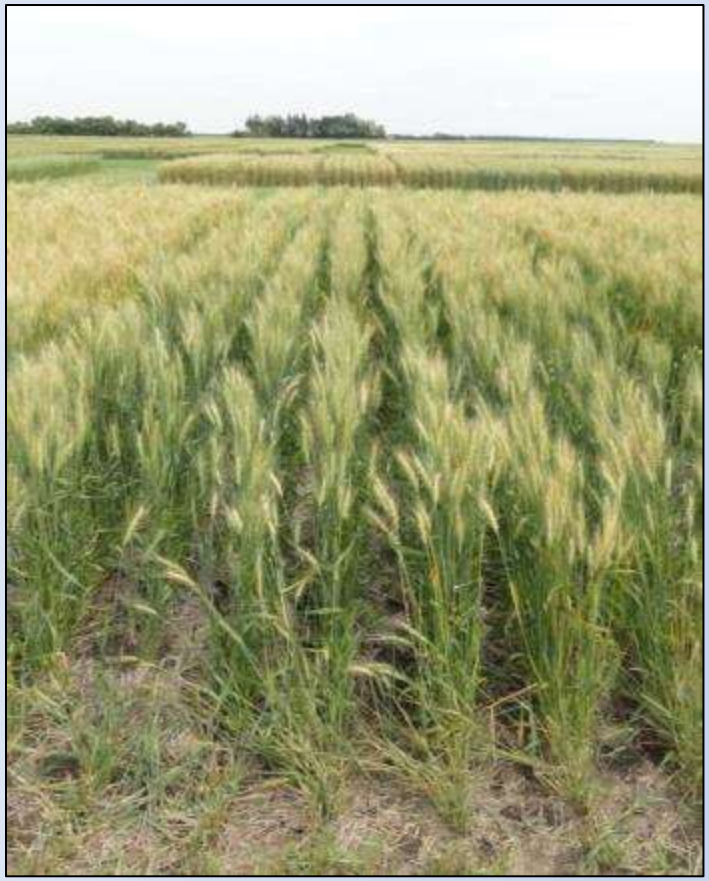


Seeding Rates & Treatments

Effects on Winter Wheat Grain Yield



Seed Treatment Effects
August 10, 2014 (Indian Head)

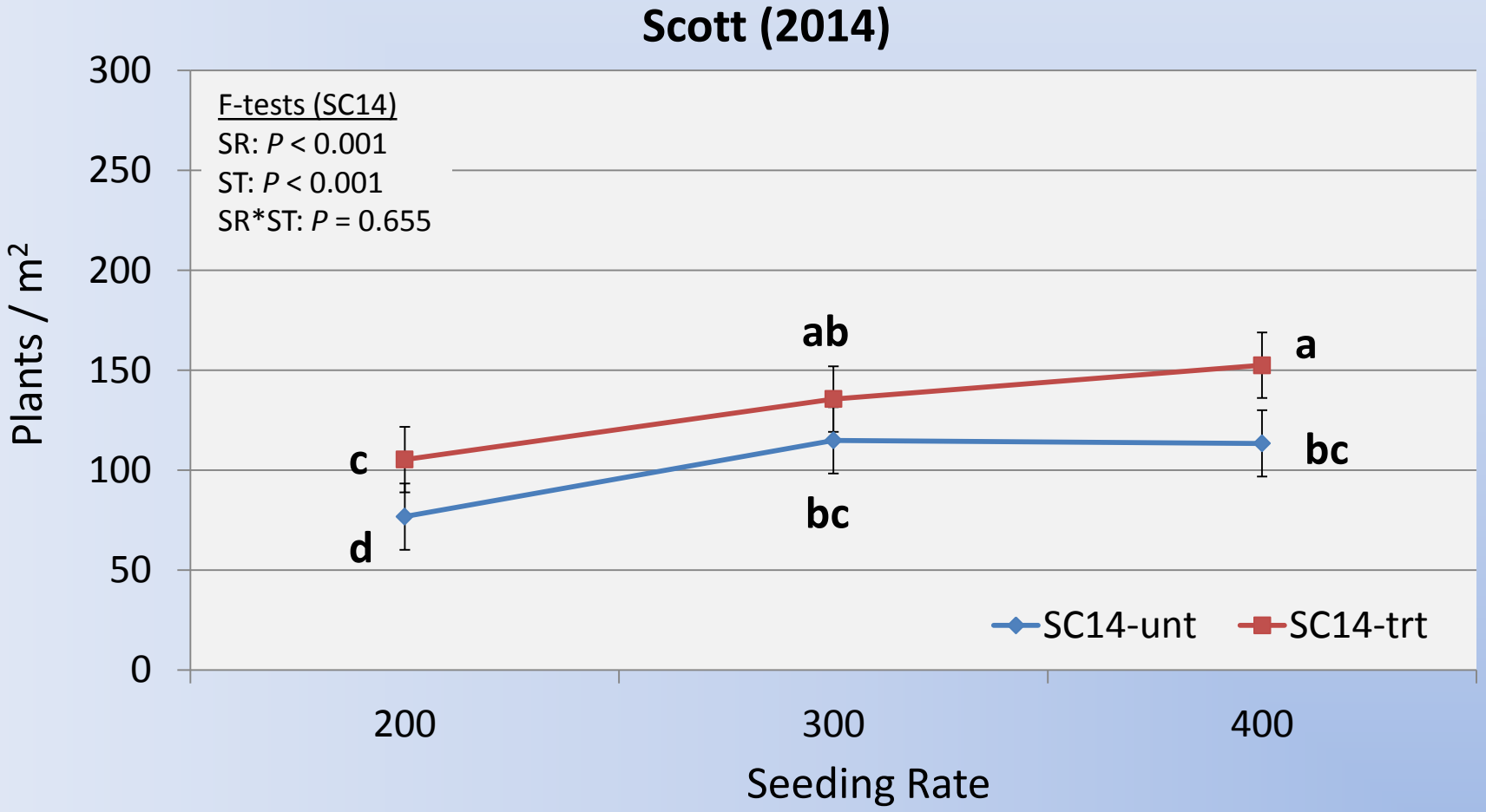


200 seeds/m^2 – untreated seed

200 seeds/m^2 – treated seed

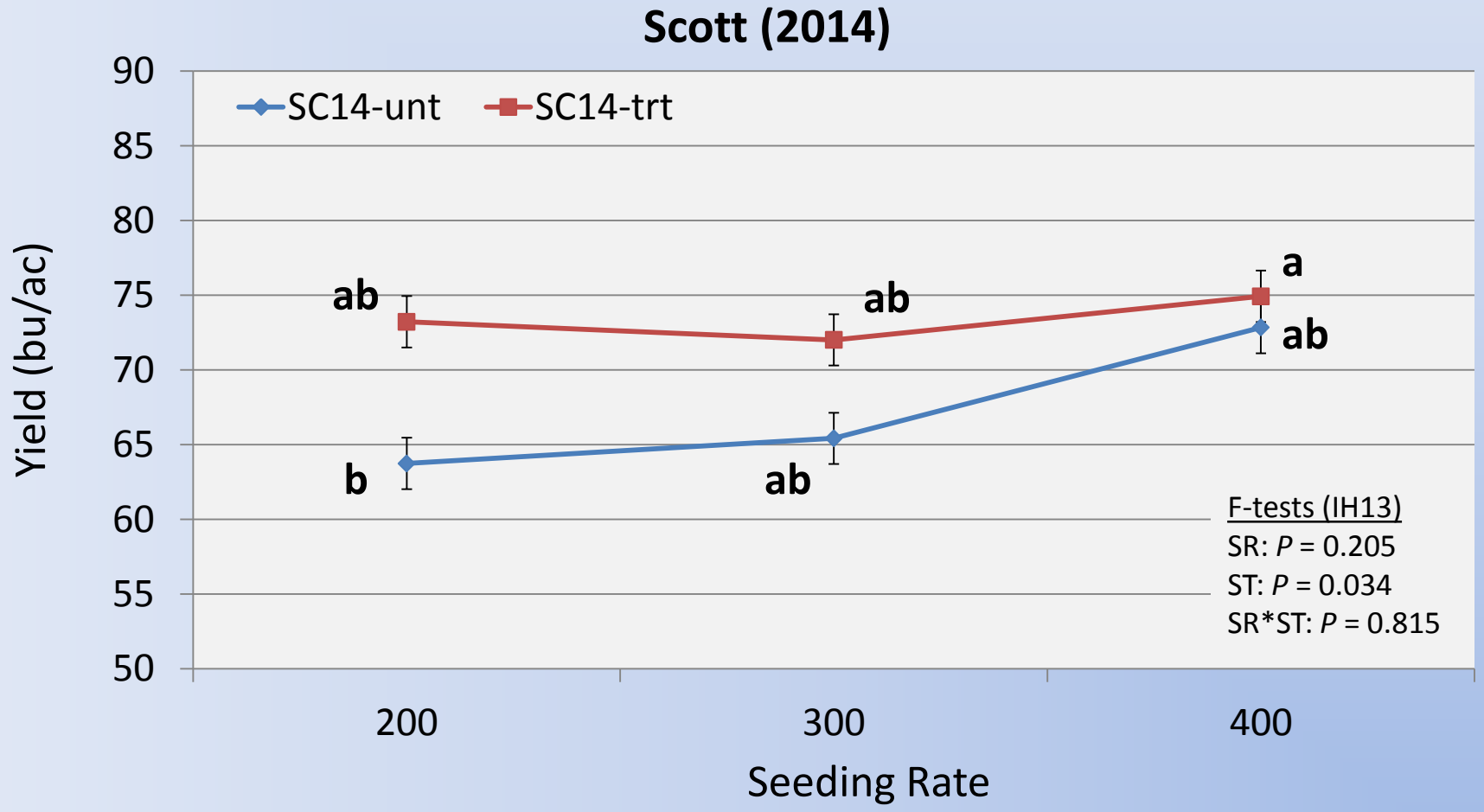
Seeding Rates & Treatments

Effects on Winter Wheat Establishment



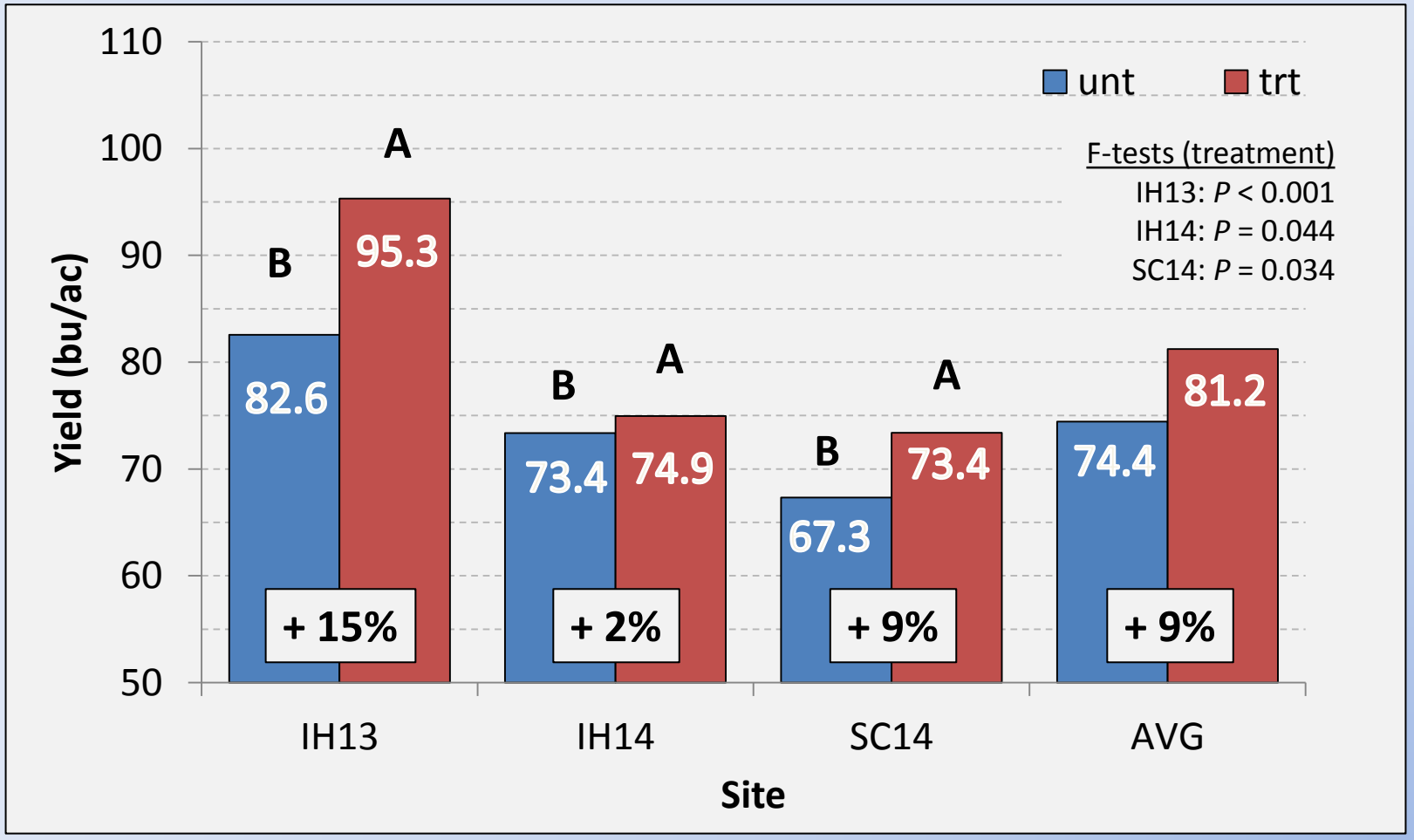
Seeding Rates & Treatments

Effects on Winter Wheat Grain Yield



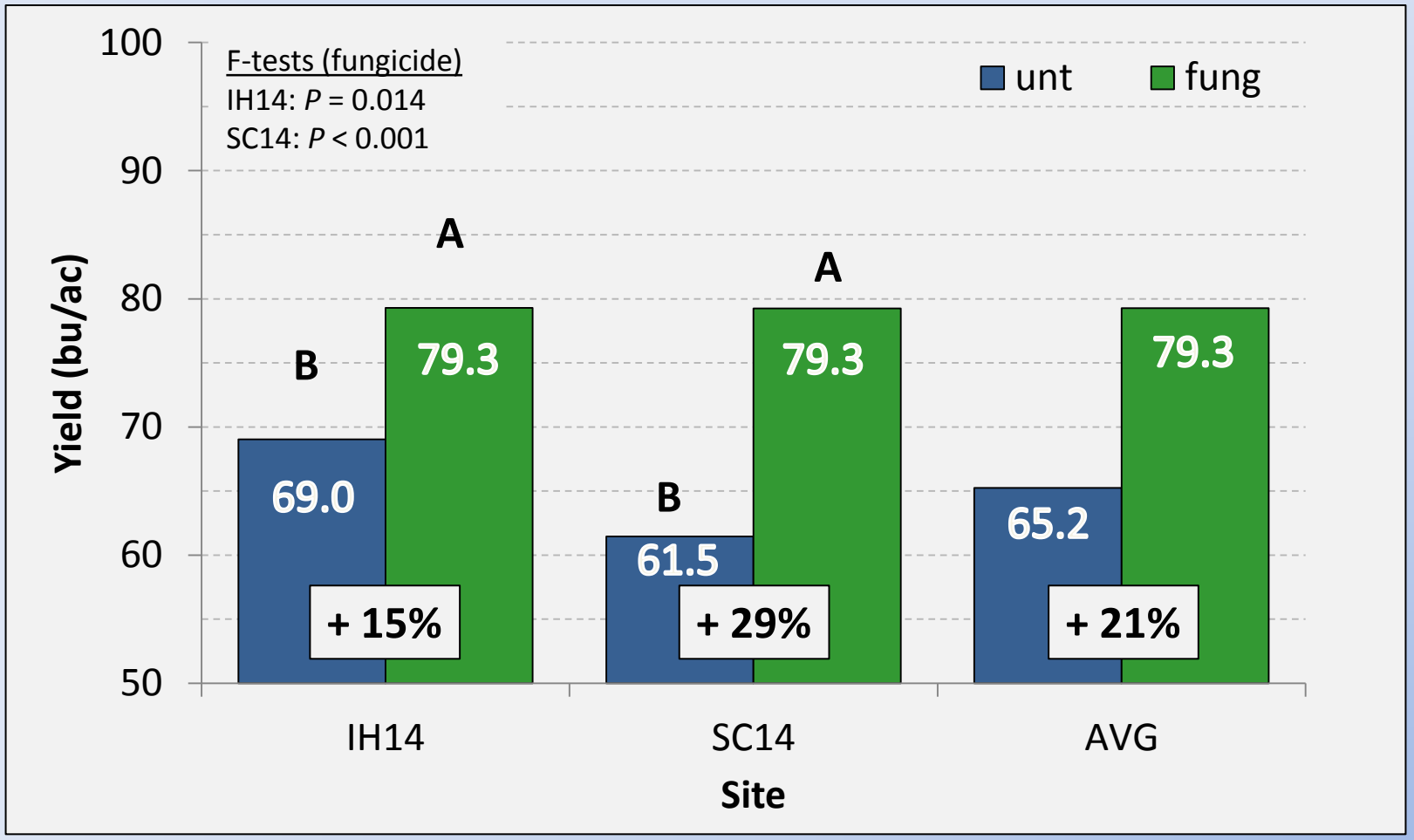
Seed Treatment

Effects on Winter Wheat Yield



Foliar Fungicide

Effects on Winter Wheat Yield



Timing of Foliar Fungicide

Indian Head (2013-14) and Scott (2014)

Treatments:

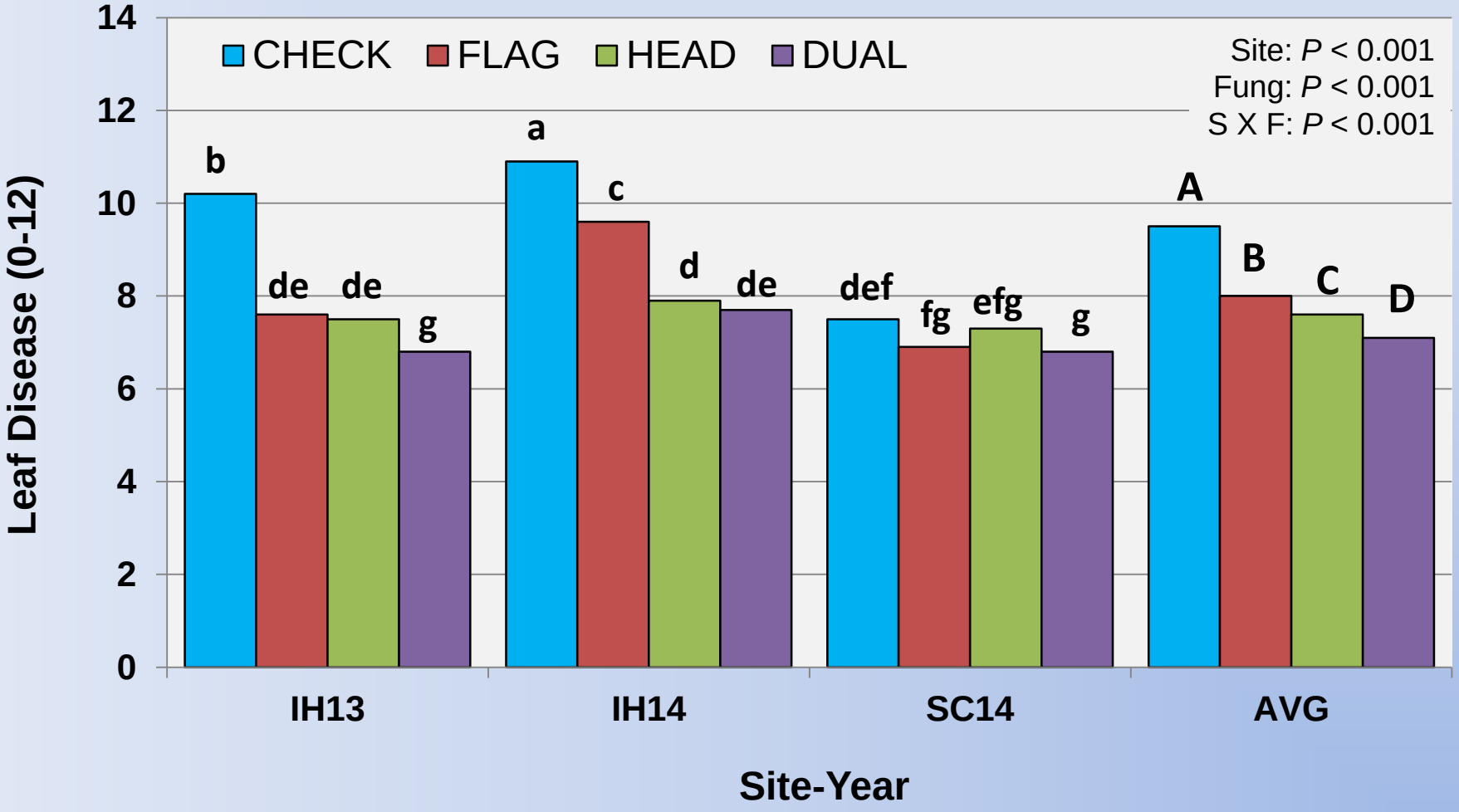
1) Check (no fungicide)
2) Twinline* (T1–flag)
3) Prosaro** (T2–head)
4) Dual (T1 + T2)

* Pyraclostrobin (65 g/ha) + metconazole (40 g/ha)

**Prothioconazole (100 g/ha) + tebuconazole (100 g/ha)

Timing of Foliar Fungicide

Effects on Leaf Disease



Leaf Disease at Indian Head
July 29, 2013

UNTREATED CHECK

FUNGICIDE APPLIED

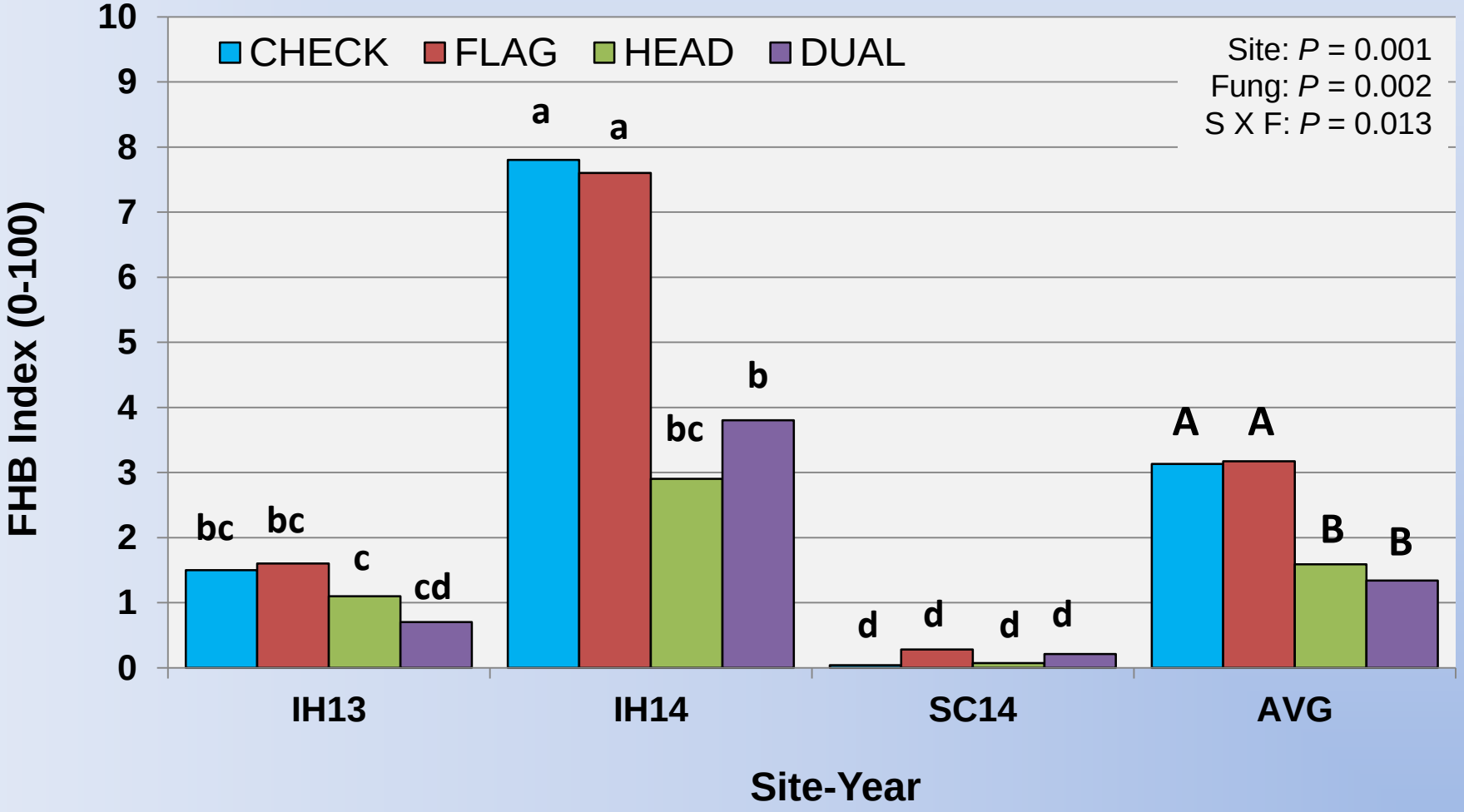
Leaf Disease at Indian Head
Aug. 6, 2014

UNTREATED CHECK

FUNGICIDE APPLIED

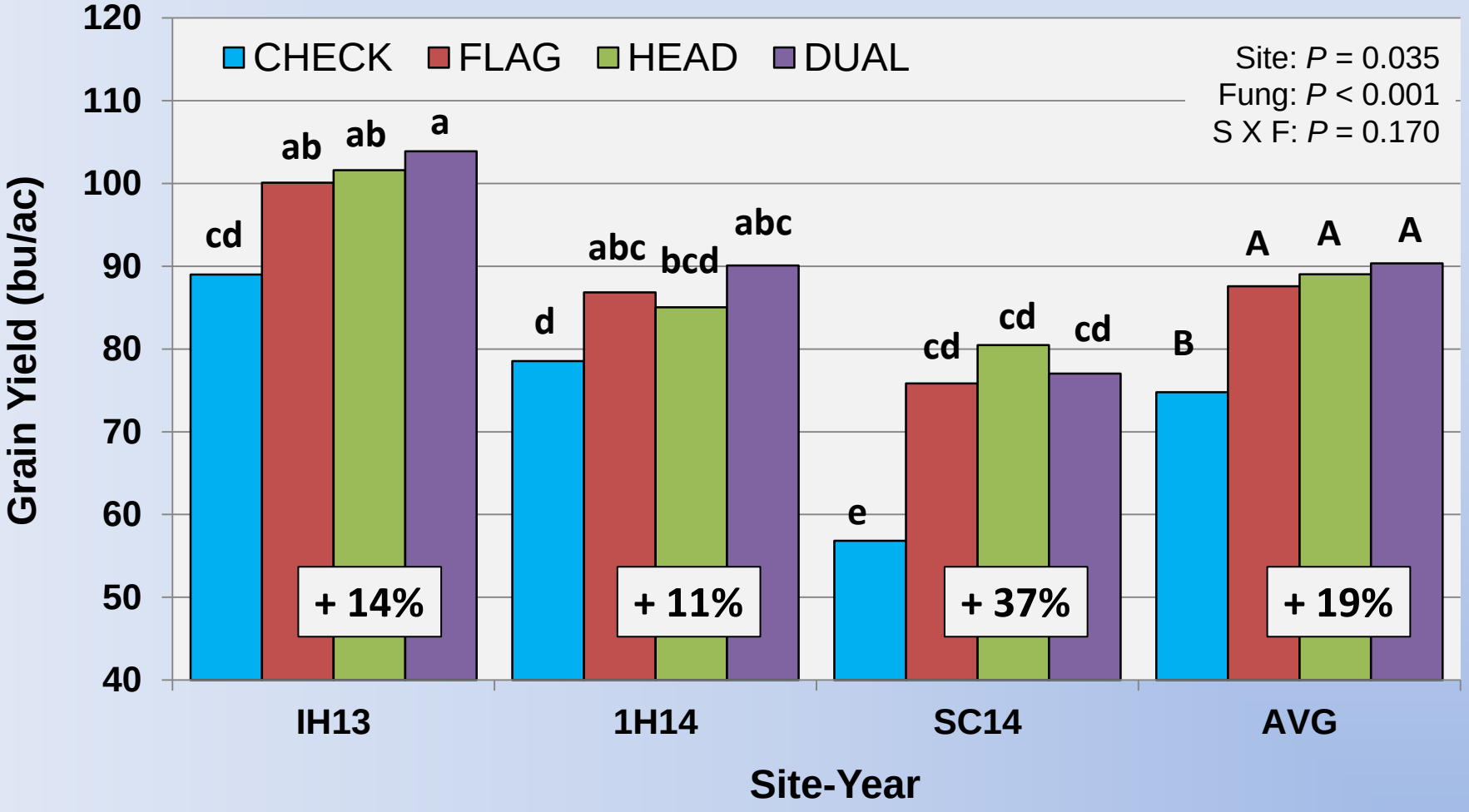
Timing of Foliar Fungicide

Effects on Fusarium Head Blight



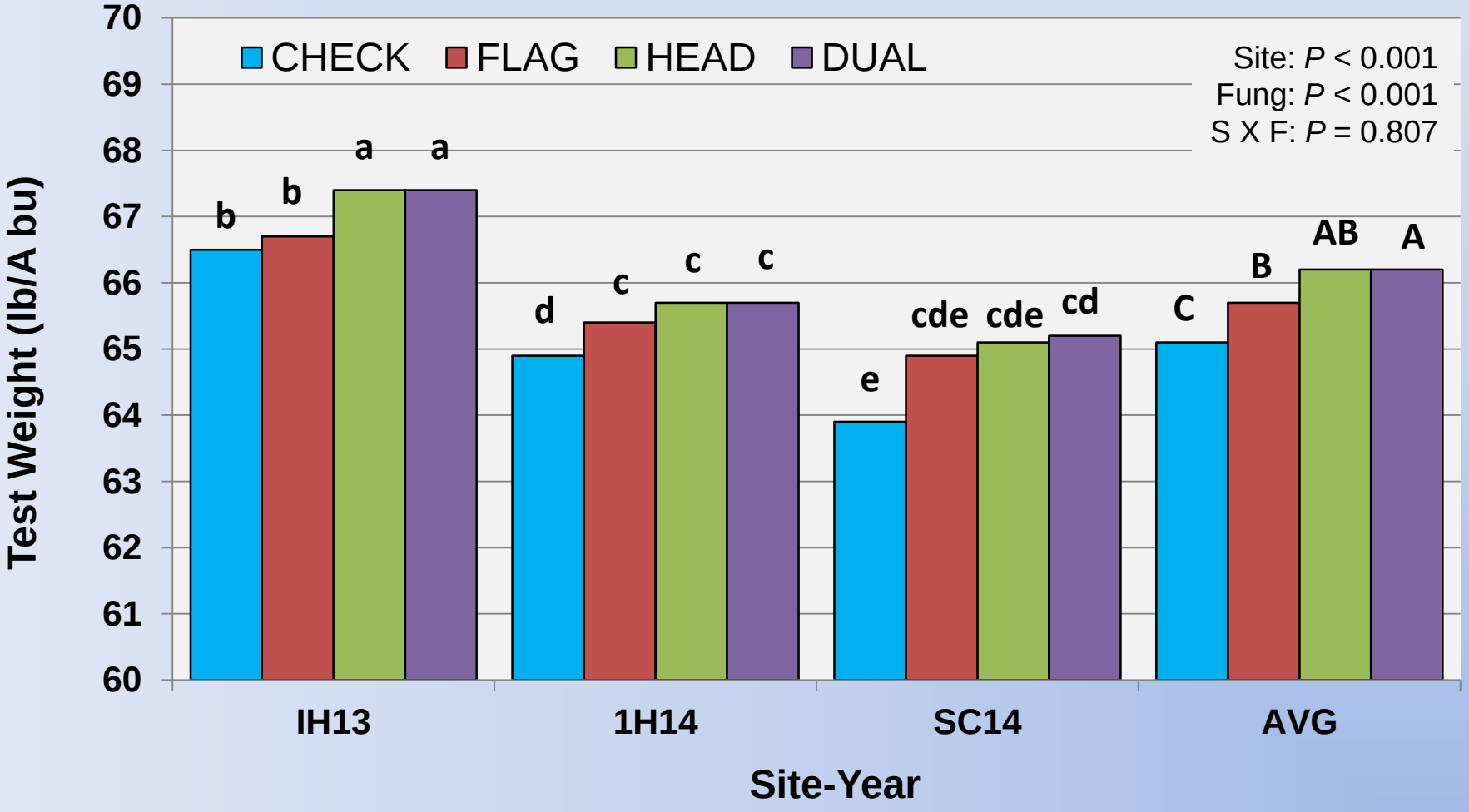
Timing of Foliar Fungicide

Effects on Grain Yield



Timing of Foliar Fungicide

Effects on Test Weight



Nitrogen Fertility Options
Indian Head (2013-14)

23 N fertilizer treatments:

Application Rates:

1) 0 N, 2) 75 kg N ha^{-1}, 3) 115 kg N ha^{-1}

Nitrogen Source:

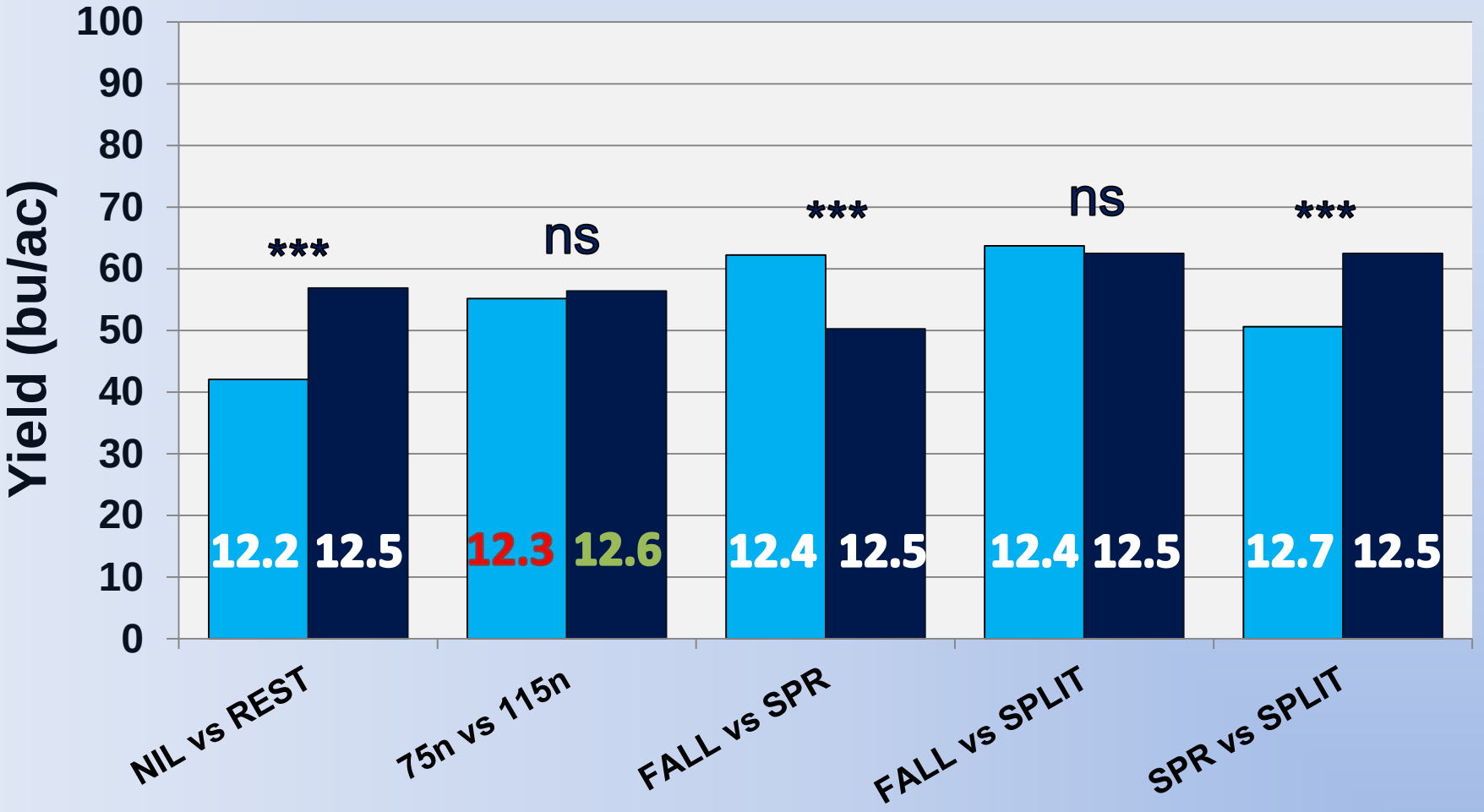
1) Urea, 2) ESN, 3) NSN/SUPERU, 4) UAN

Placement/Timing:

1) Fall side-band/surface dribble 2) Spring broadcast/surface dribble, 3) 40/60 split

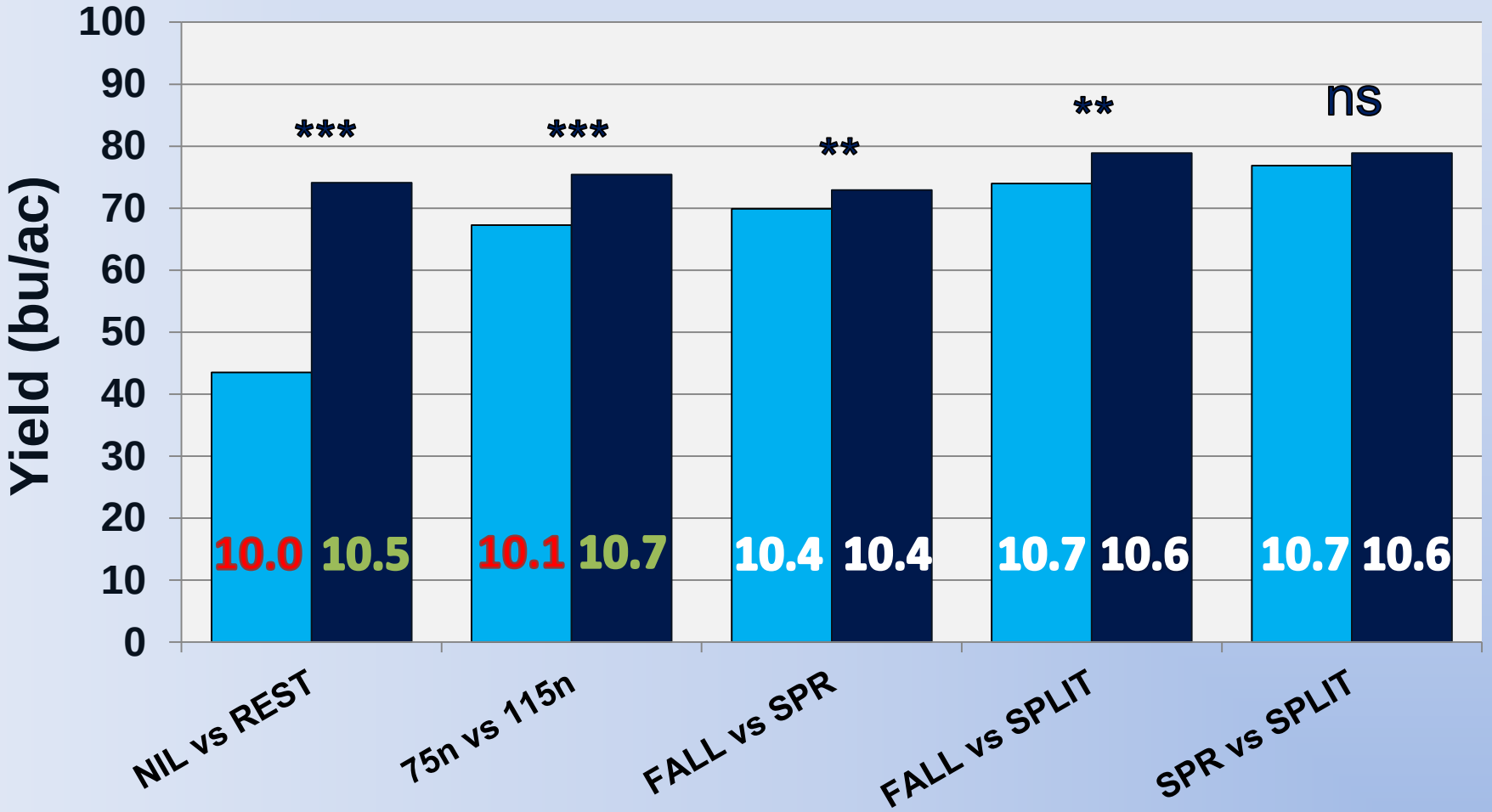
Nitrogen Rate, Placement & Timing

Indian Head 2013



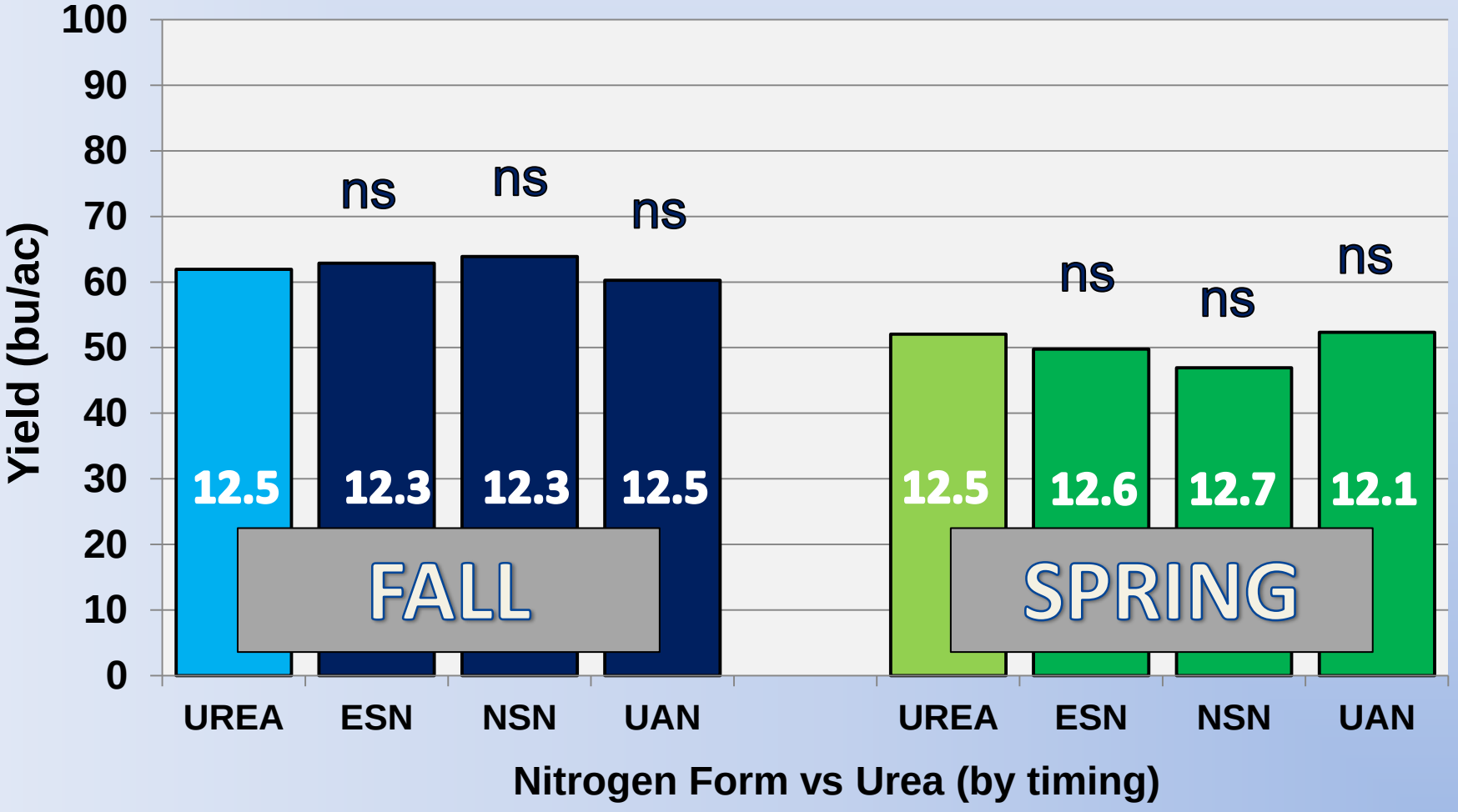
Nitrogen Rate, Placement & Timing

Indian Head 2014



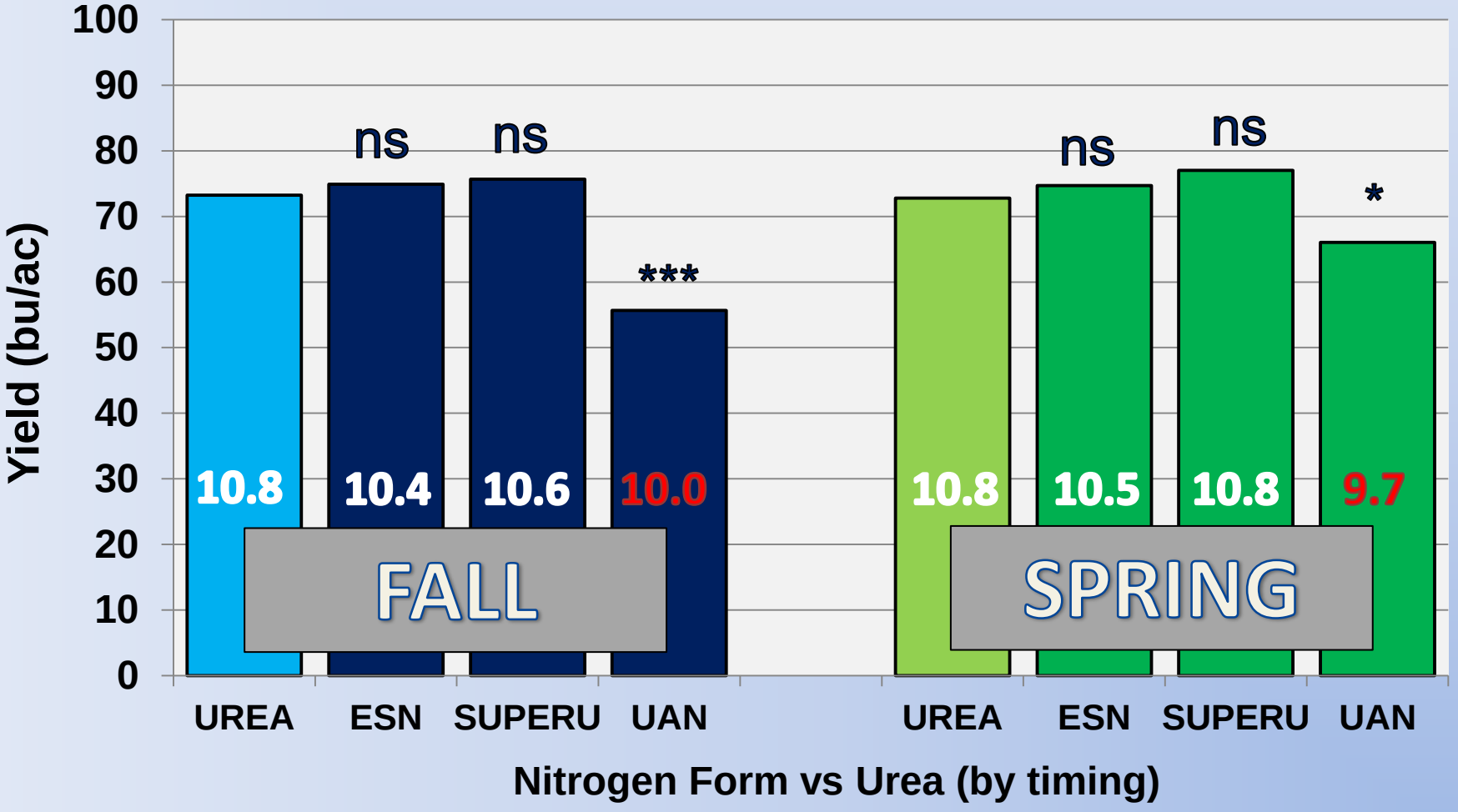
Nitrogen Fertilizer Forms

Indian Head 2013



Nitrogen Fertilizer Forms

Indian Head 2014



Winter Wheat - Summary

- Winter wheat that doesn't emerge in fall will still set seed & can yield well – assess stand May 15-25 to allow reseeding if needed
  - 200+ plants m^{-2} optimal but 90-100 plants m^{-2} usually viable with adequate fertility and weed control
- Using a seed treatment is recommended, especially when seeding into dry or cold soils (+9% yield increase averaged over 3 sites)
- Applying entire N fertilizer requirements at planting can be risky but banding some N at planting is recommended - particularly when dry
  - Split applications are more costly but perform well under all conditions
  - Slow release N forms (i.e. ESN, SUPERU) are a good fit for winter cereals, but actual benefits will be inconsistent depending on environmental conditions
- Foliar fungicides protect yields and quality under adequate disease pressure (20% yield benefit averaged over 3 sites)
  - If leaf disease is minor at flag-leaf stage, a single fungicide application at early heading is likely most economical

Soybean Agronomy Update

2014 Field Trial Results Summary

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Canada

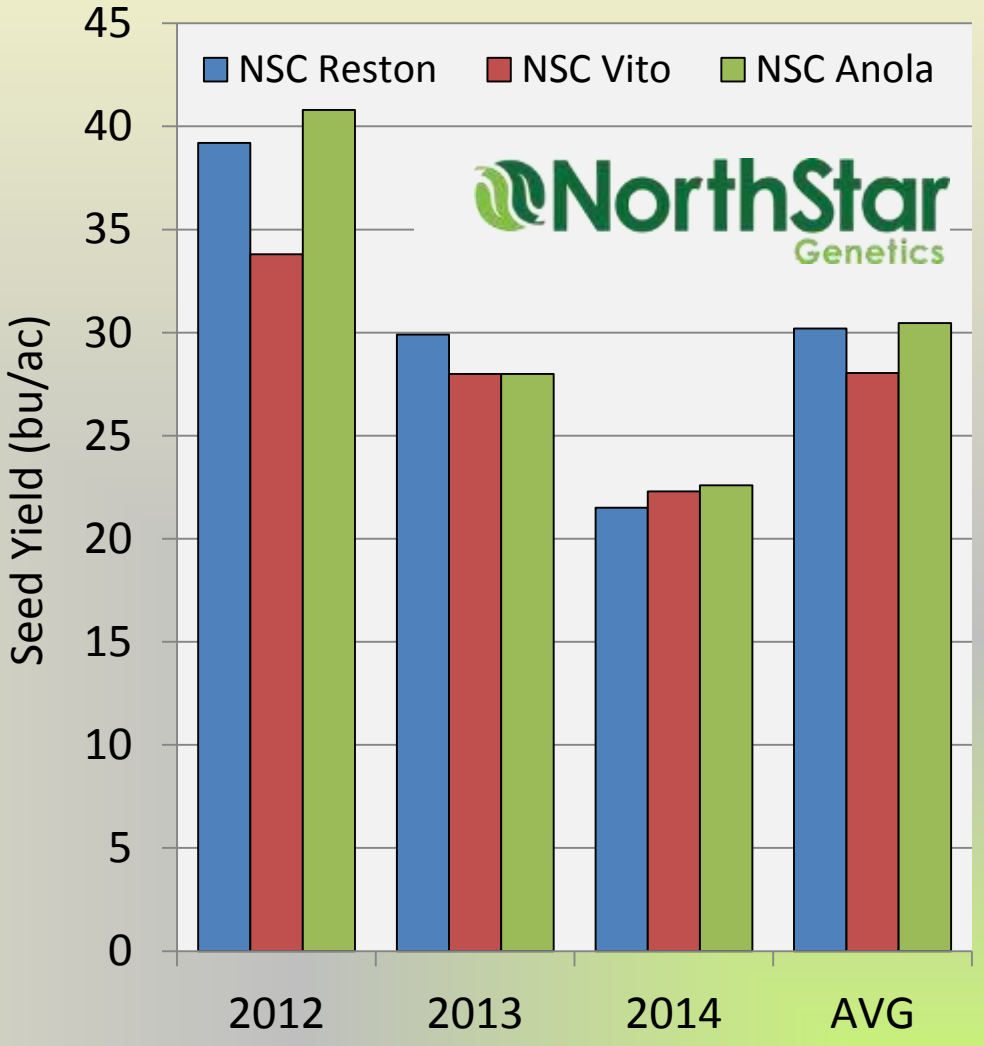
IHARF Soil & Crop Management Seminar
Feb. 4, 2015, White City, Saskatchewan

IHARF's Recent Soybean History

2012: First recent industry funded variety trial on 2012
- **1 trial**

2013: Further industry funded variety & agronomy trials in 2013
- **6 trials**

2014: Extensive program of industry, producer, provincial and federally funded demonstrations and trials
- **11 trials** (~20% of small plot trials)



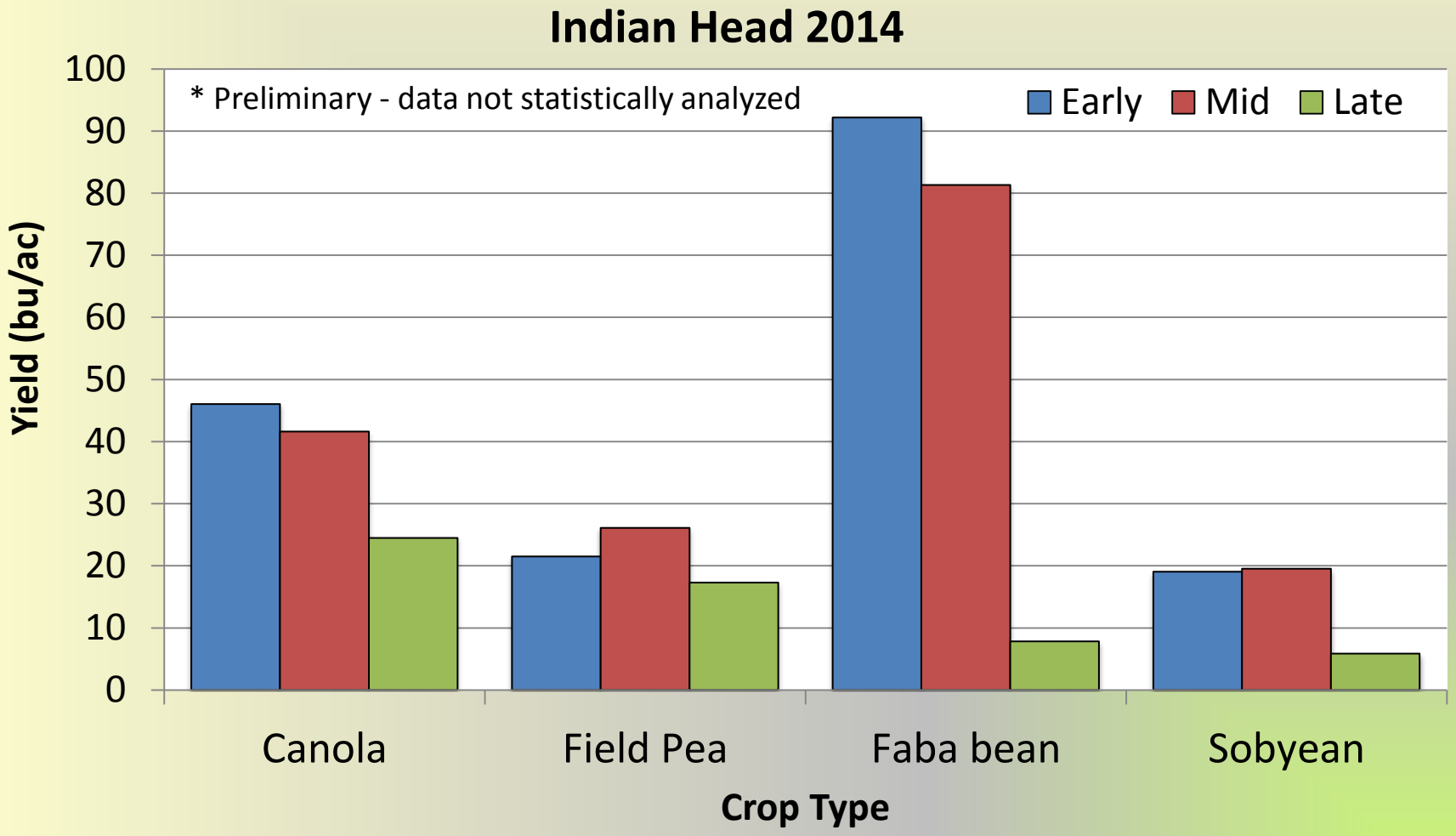
Soybean Adaptation Trial
2014 Pulse Science Cluster – GF2

- **3 soybean varieties established along with one variety each of field pea, faba bean and canola**
- **3 seeding dates ranging from early May to early June**
- PKS blend side-banded to all treatments to supply 12-18-9-9 lb/ac of N-P_2O_5-K_2O-S (105 lb N/ac for canola)
- Granular inoculant applied for field pea and soybean, self-stick peat-based for faba bean
- Herbicide and fungicide applications along with harvest operations were tailored to specific crops & seeding dates
- Tracked development, maturity and seed yield for all plots

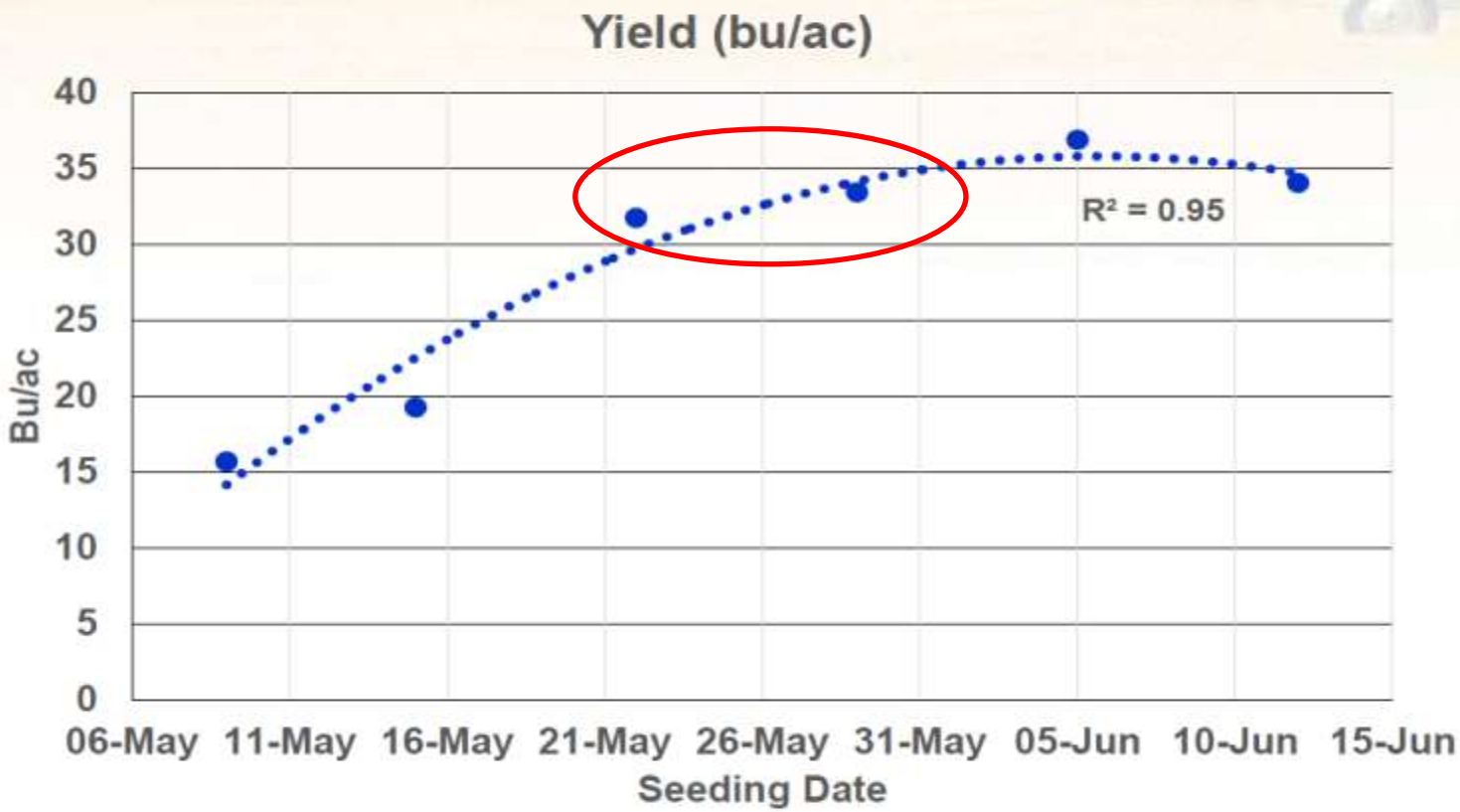
August 12 (early seeding)

August 12 (late seeding)

Seeding Date / Crop Type
Effects on Seed Yield



Soybean Seeding Date Study

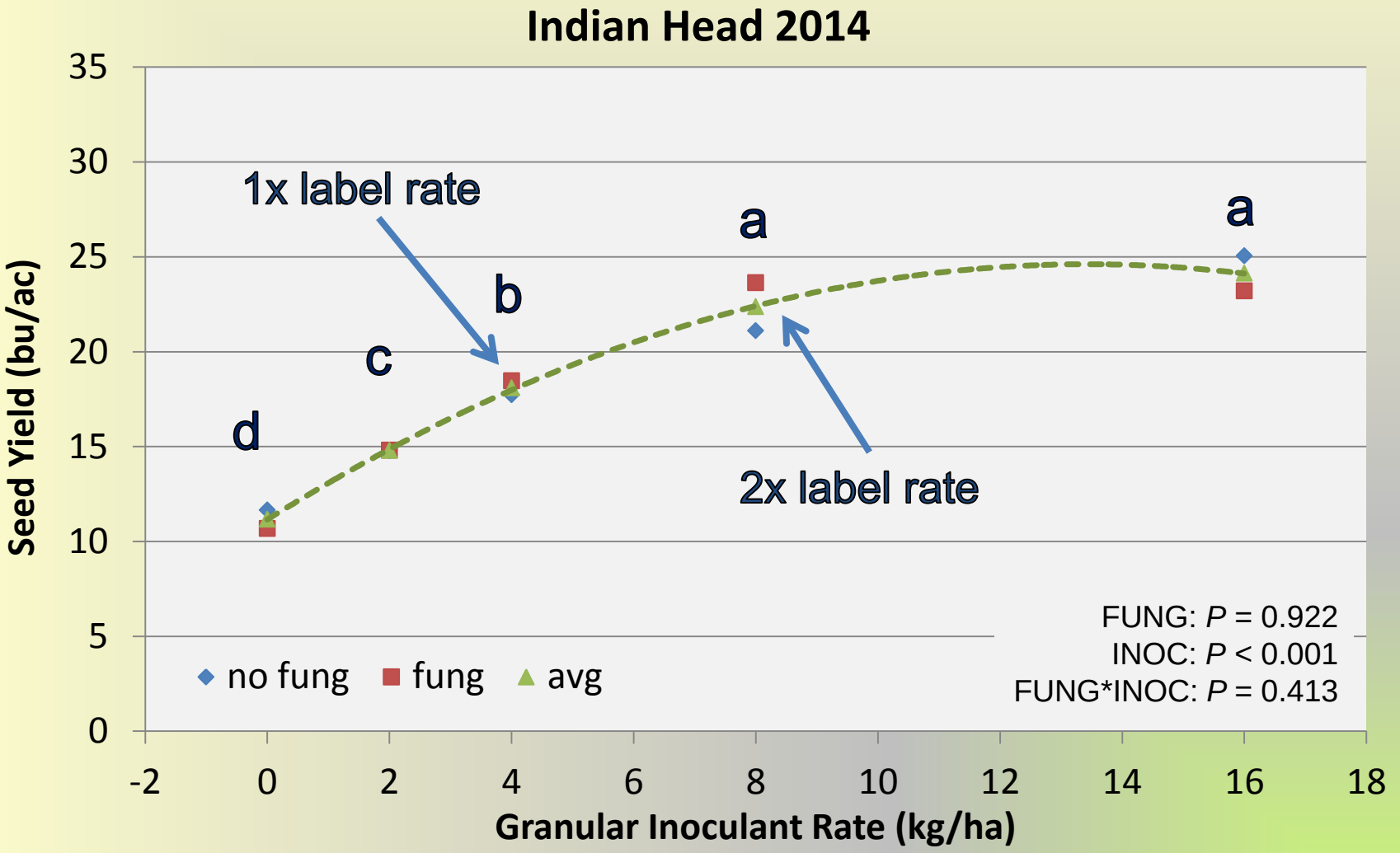


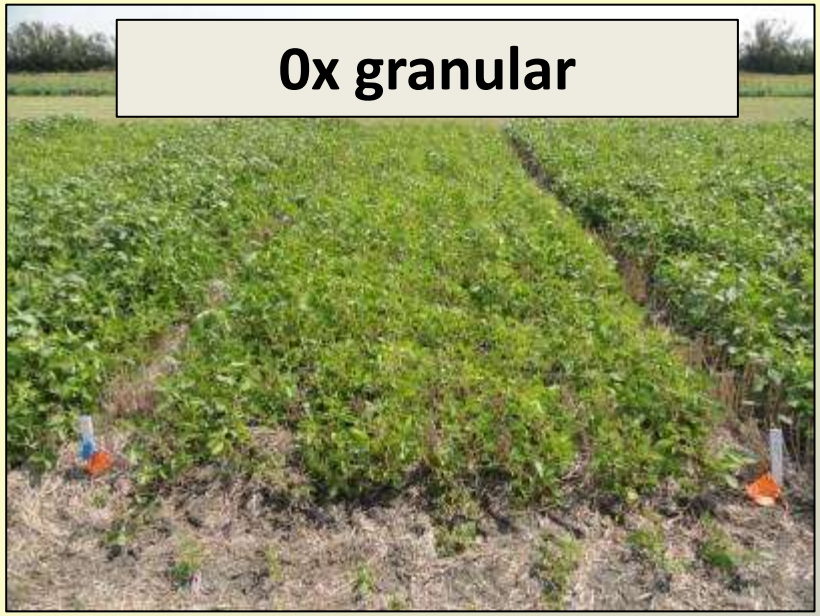
Source: Garry Hnatowich (ICDC)

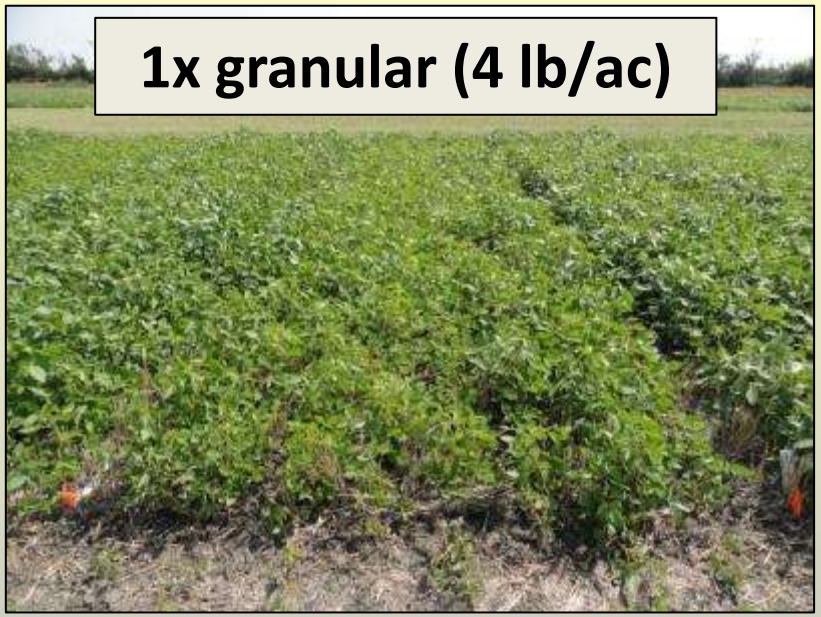
Soybean Inoculation
2014 ADOPT Granular Inoculant Trial

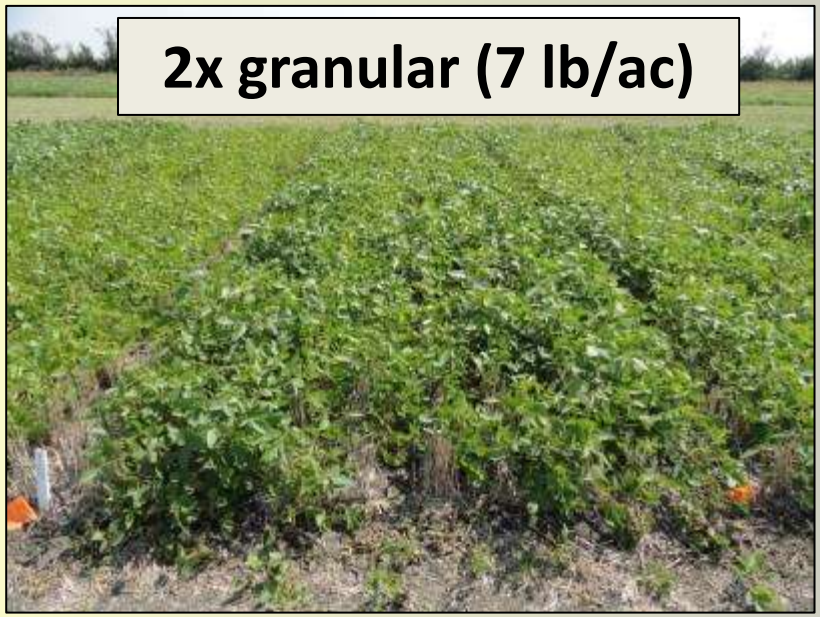
- LS002R23 seeded into barley at 210K seed/ac on May 26
- All seed pre-treated with Primo CL inoculant and Cruiser Maxx Vibrance seed treatment
- 11-52-0 side-banded to supply 25 lb P_2O_5/ac
- **Cell-Tech granular inoculant seed-placed at either 0, 2, 4, 7 or 14 lb/ac (0x, 0.5x, 1x, 2x & 4x label rate)**
- **0.16 l/ac Headline E.C. applied to half the plots**
- Early frost on Sept. 10-11, prior to pod colour change
- Straight-combined on Oct. 11-12

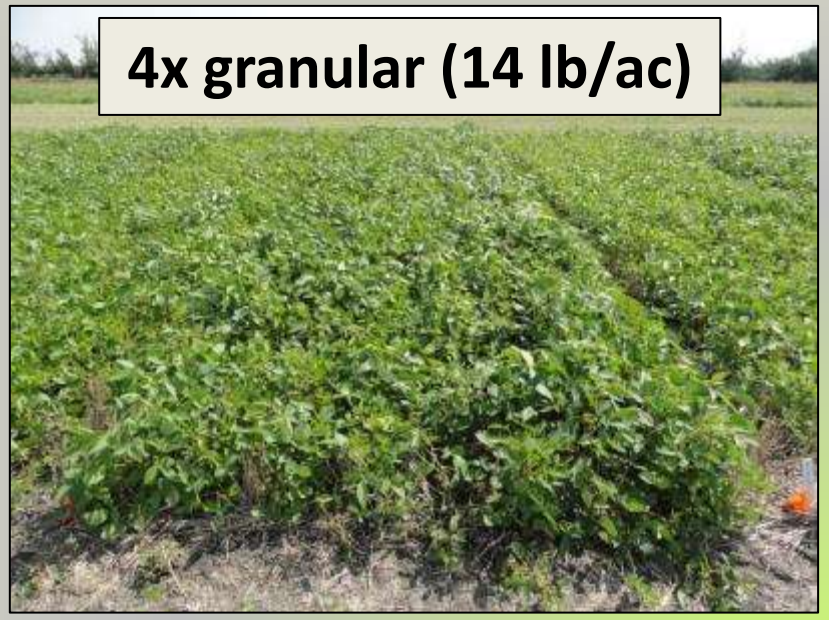
Inoculant Effects on Seed Yield




0x granular


1x granular (4 lb/ac)


2x granular (7 lb/ac)

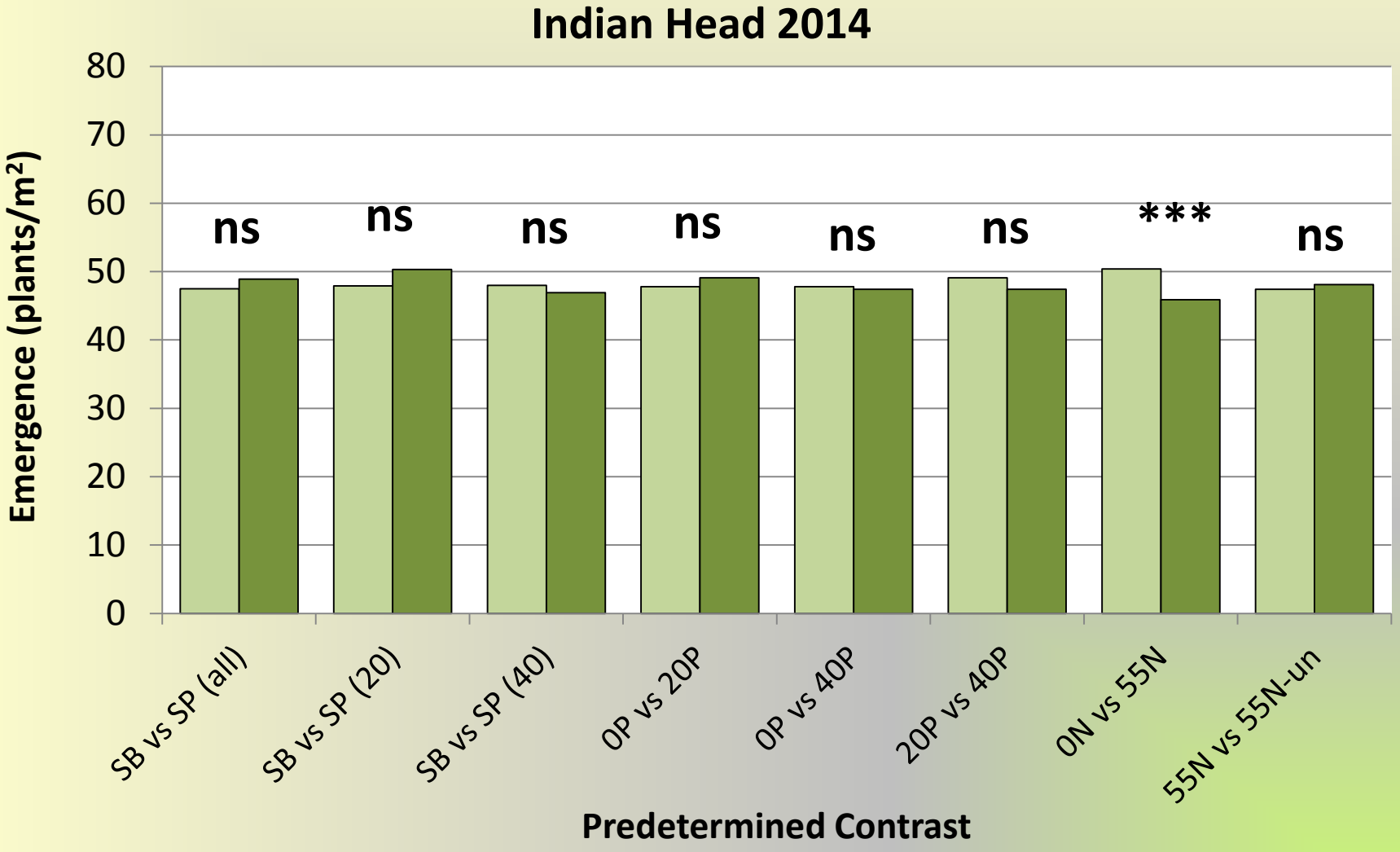

4x granular (14 lb/ac)

Soybean Fertility

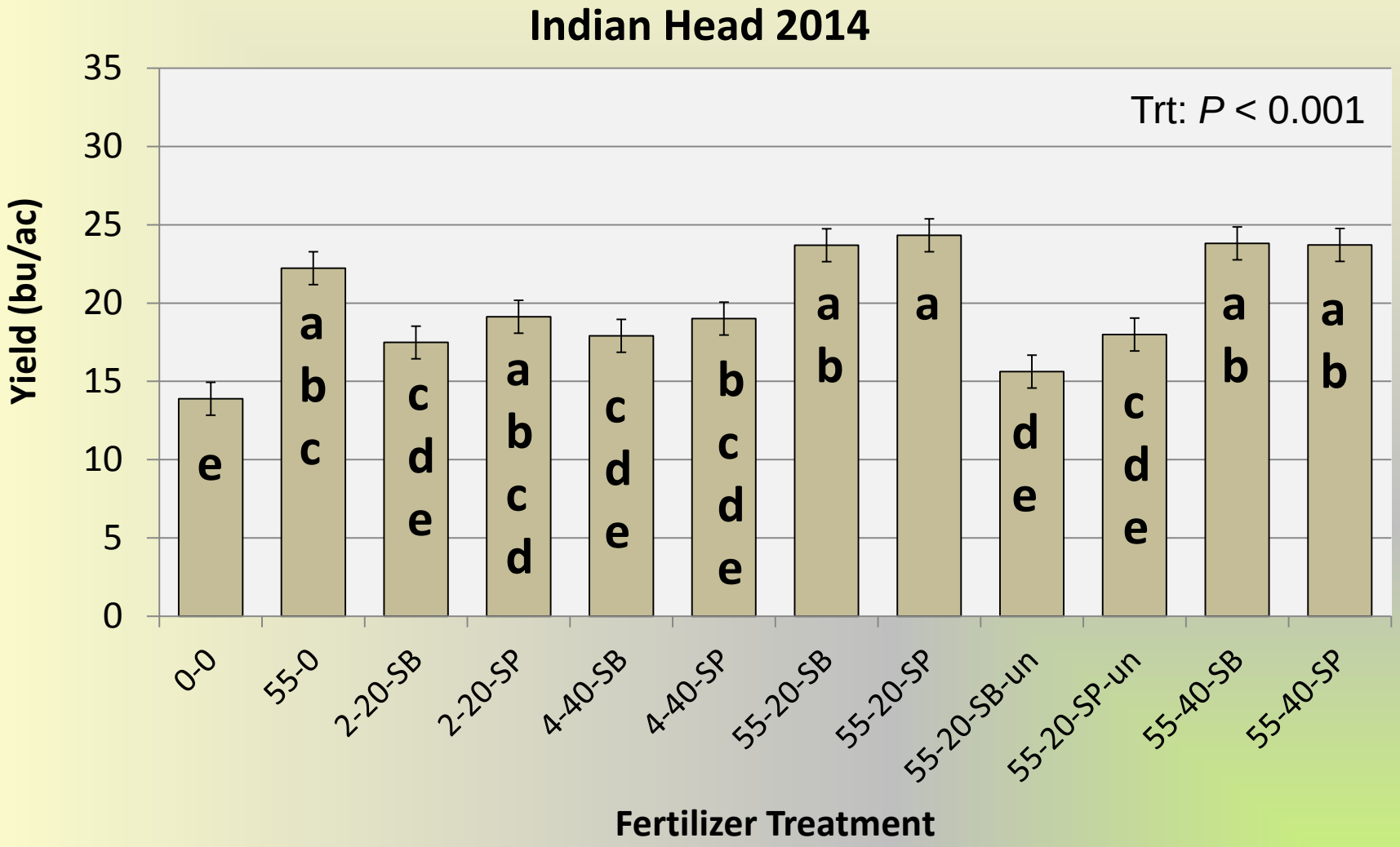
2014 ADOPT N & P Fertility Trial

- LS002R23 seeded into barley at 210K seed/ac on May 24
- All seed pre-treated with Primo CL inoculant and Cruiser Maxx Vibrance seed treatment
- Cell-Tech granular seed-placed at 3.6 lb/ac (as per protocol)
- **11-52-0 side-banded or seed-placed to supply 0, 18 or 36 lb P_2O_5/ac (0, 20 or 40 kg ha^{-1})**
- **46-0-0 side-banded to supply either no additional N (0) or 50 lb N/ac total**
- Early frost on Sept. 10-11, prior to pod colour change
- Straight-combined on Oct. 12

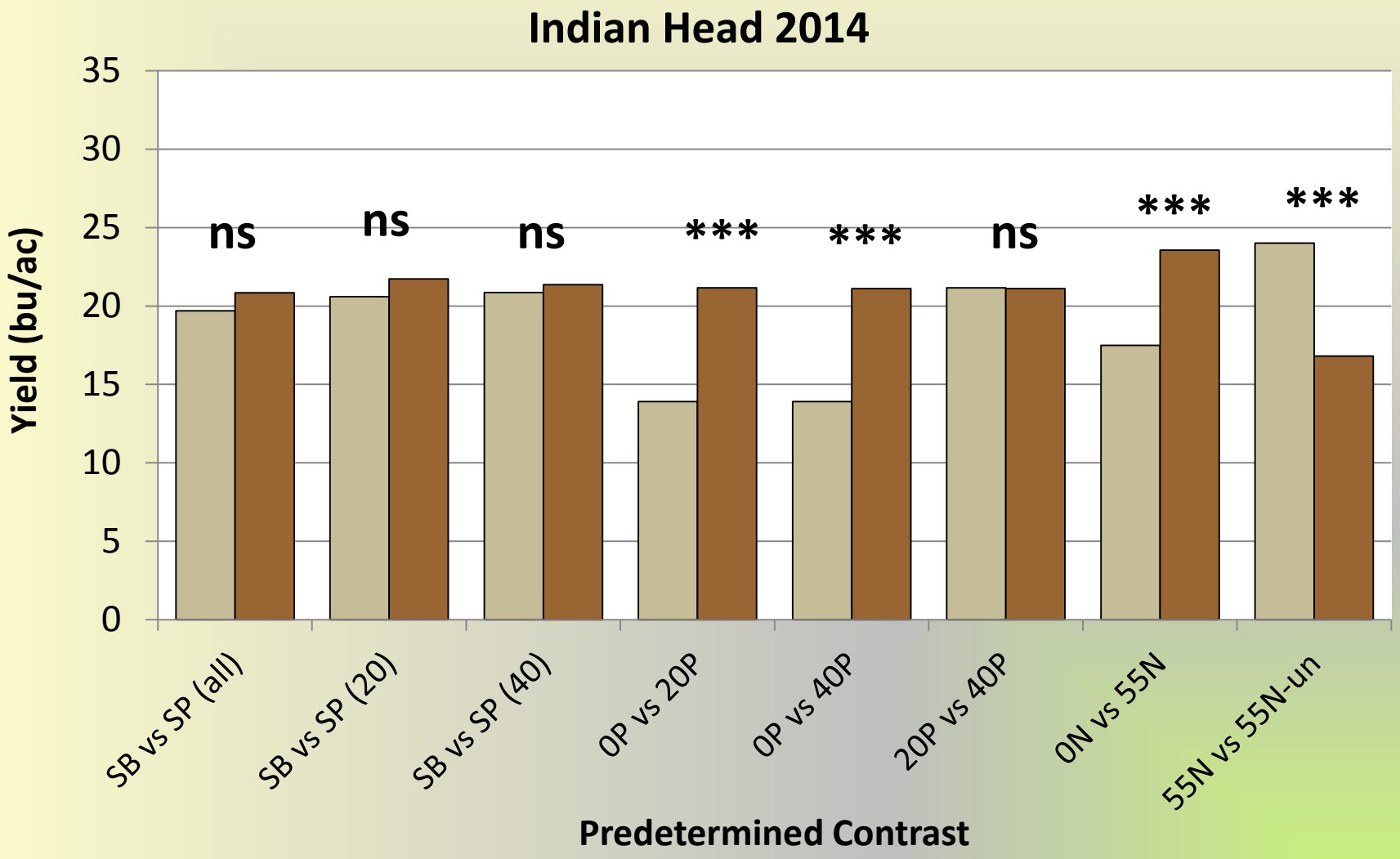
Contrast Results for Emergence

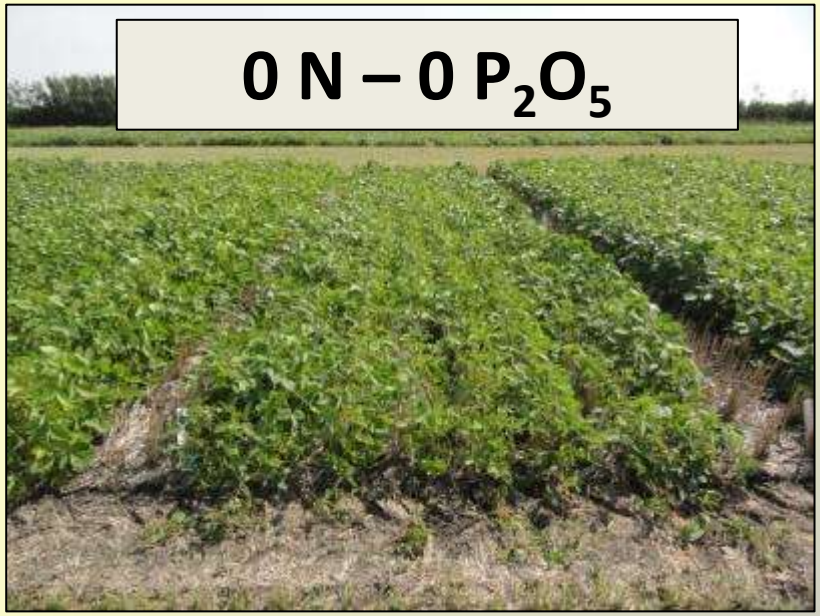


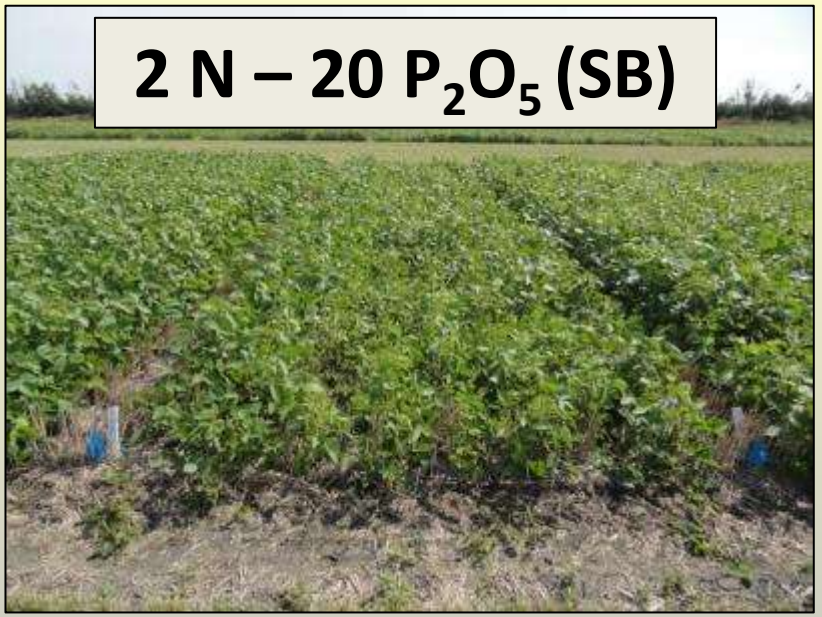
N & P Effects on Seed Yield

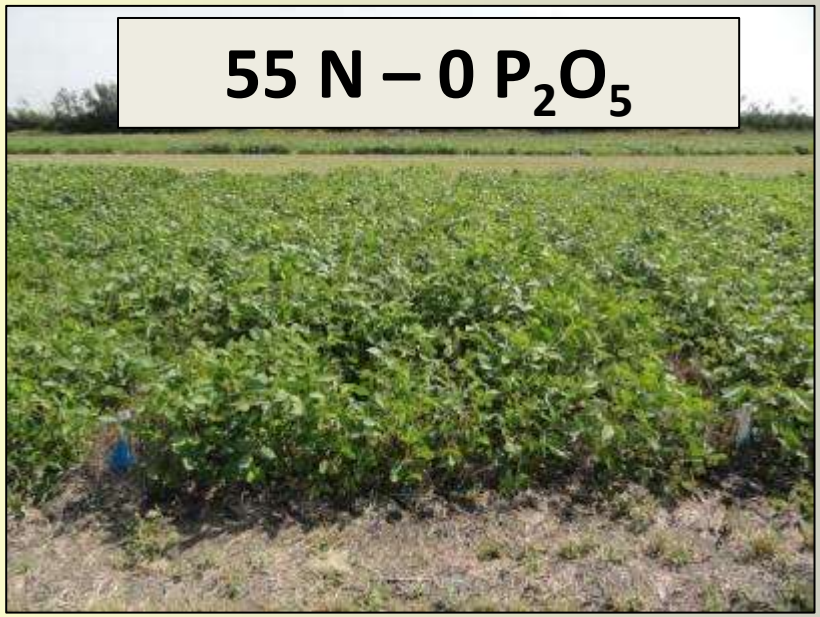


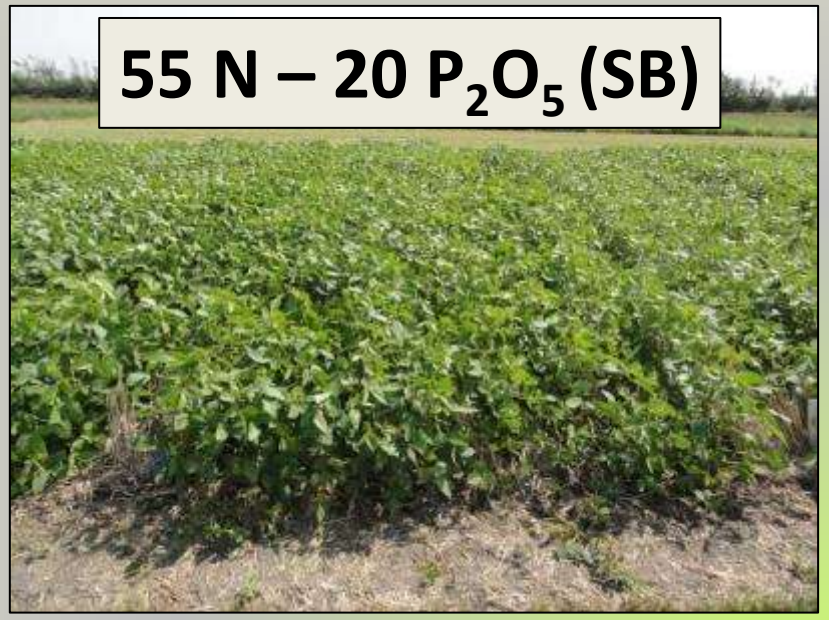
Contrast Results for Yield




0 N – 0 P_2O_5


2 N – 20 P_2O_5 (SB)

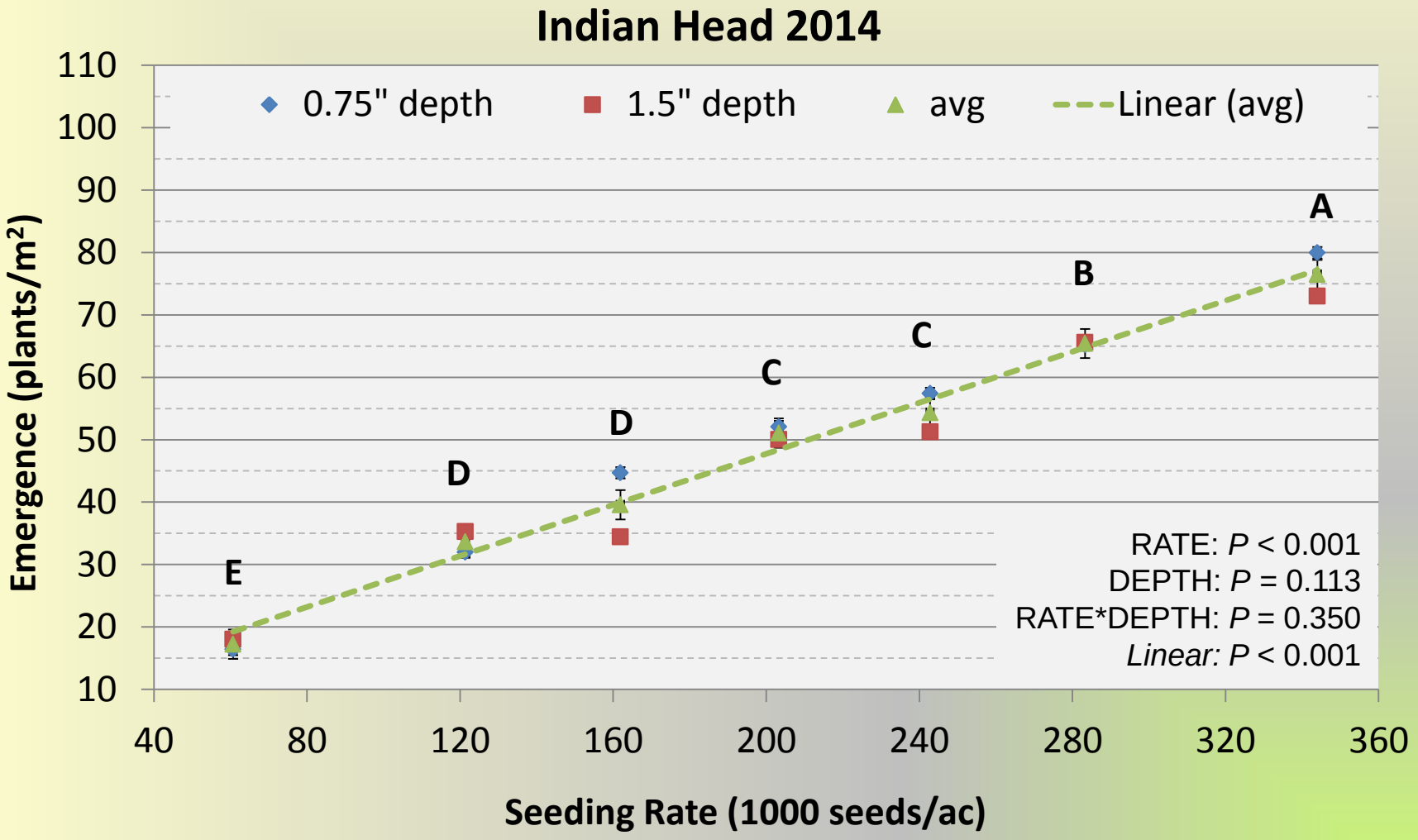

55 N – 0 P_2O_5


55 N – 20 P_2O_5 (SB)

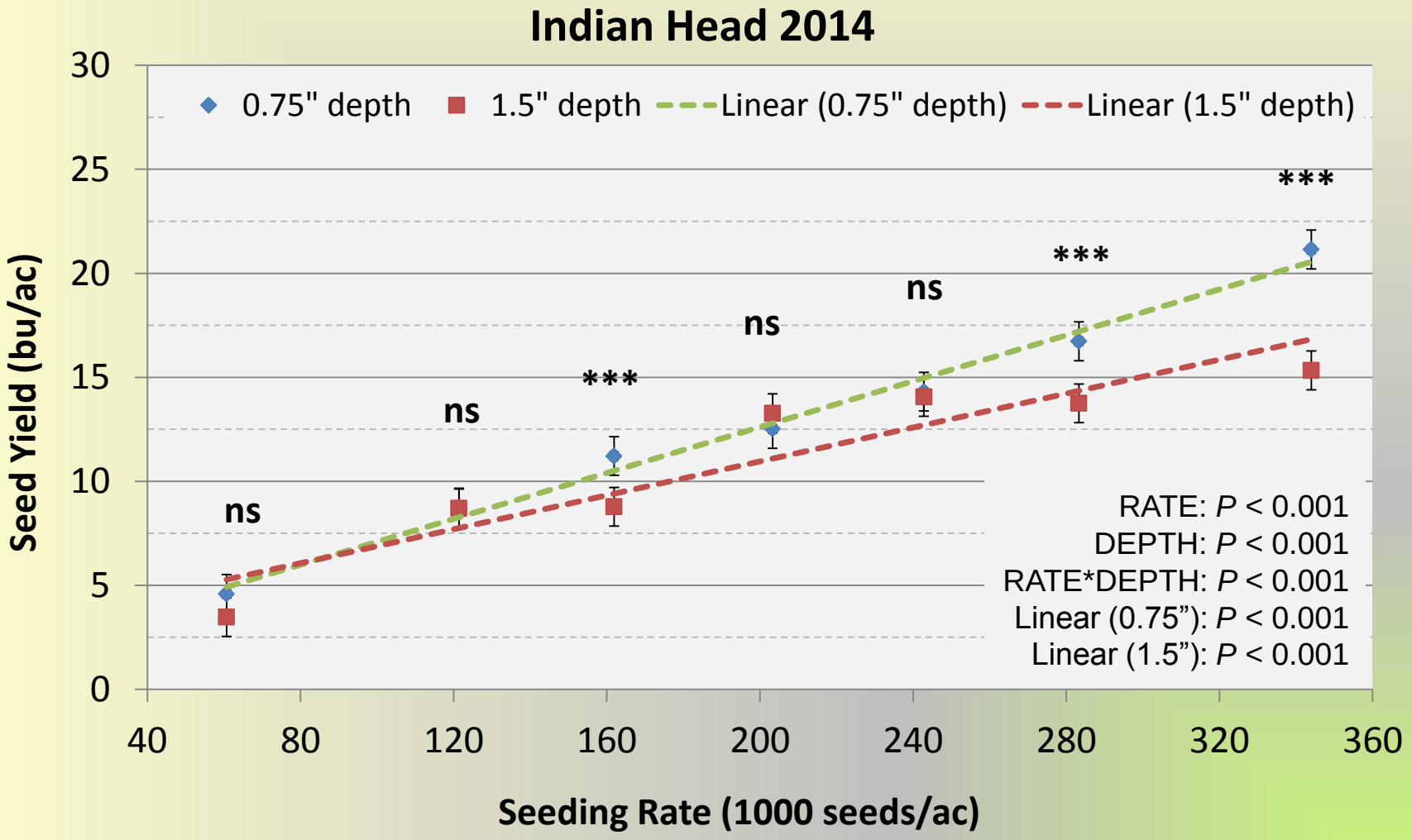
Soybean Seed Rate & Depth
2014 Pulse Science Cluster - GF2

- NSC Moosomin seeded into barley stubble on May 24
- **Rates of 61k, 121k, 162k, 203k, 243k, 283k or 334k seeds/ac**
- **Target seeding depth of 3/4" (shallow) or 1.5" (deep)**
- All seed pre-treated with Nodulator Pro inoculant and Cruiser Maxx Vibrance seed treatment
- 11-52-0 side-banded to supply 25 lb P_2O_5/ac
- Cell-Tech granular inoculant seed-placed at 3.6 lb/ac
- Early frost on Sept. 10-11, prior to pod colour change
- Straight-combined on Oct. 13

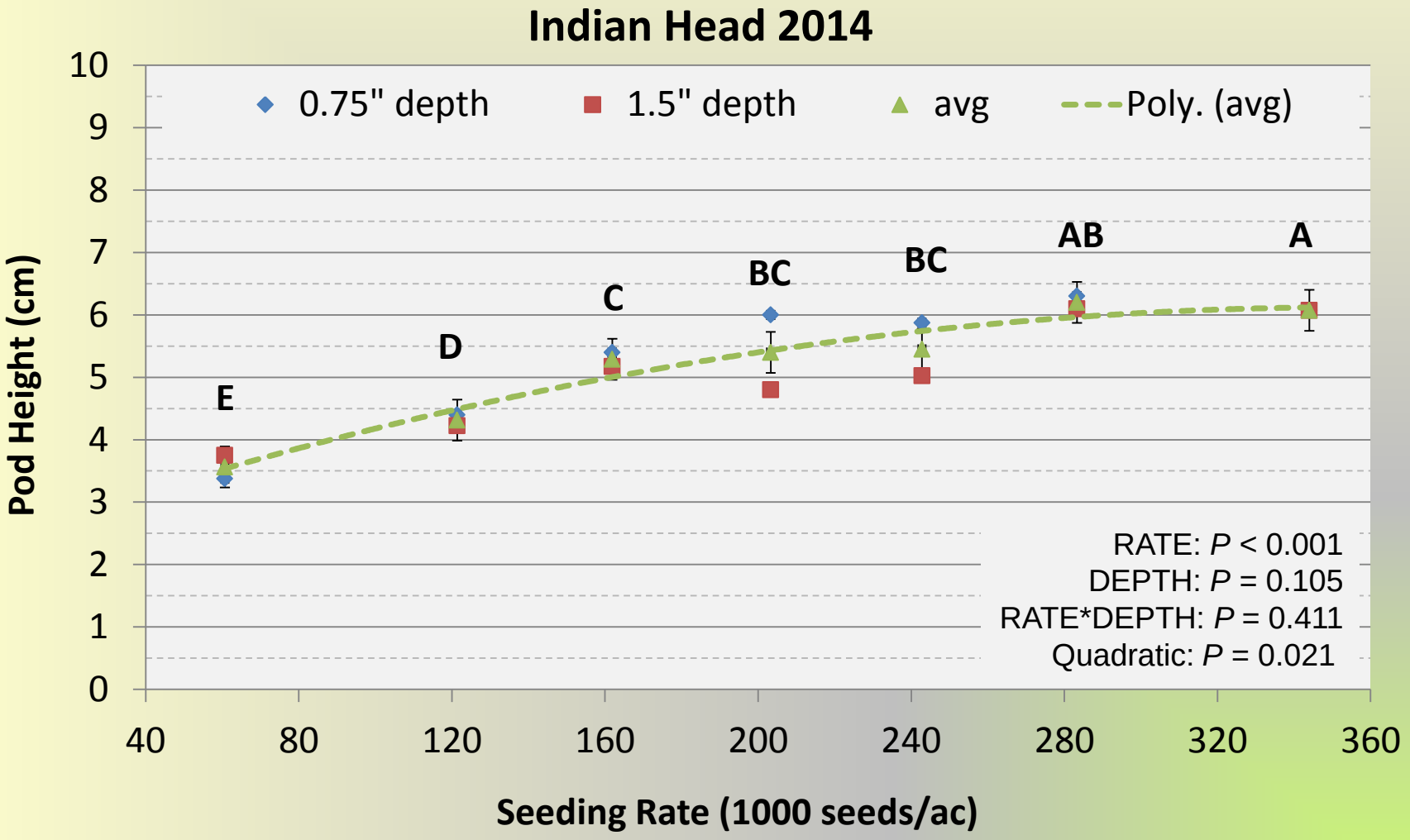
Soybean Seeding Rate & Depth
Effects on Emergence



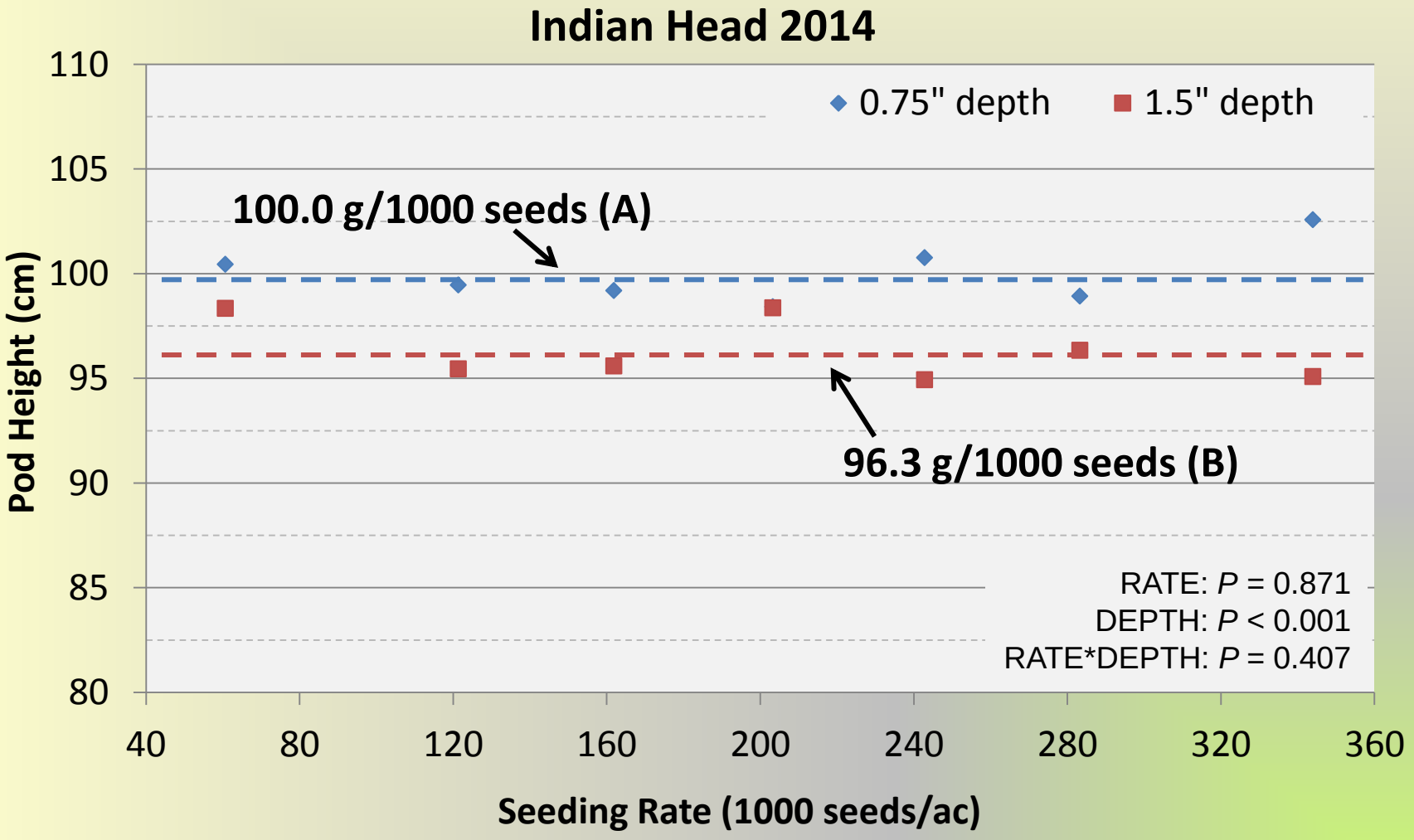
Soybean Seeding Rate & Depth
Effects on Seed Yield

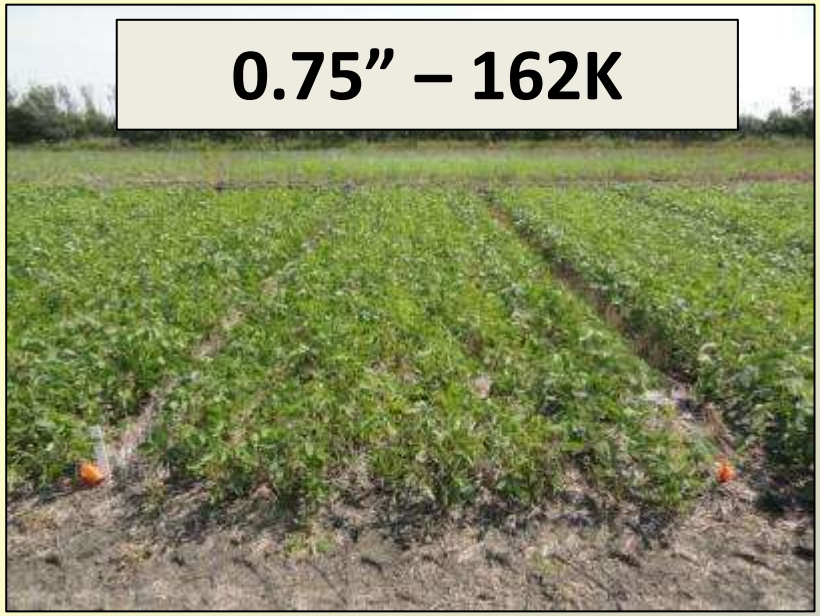


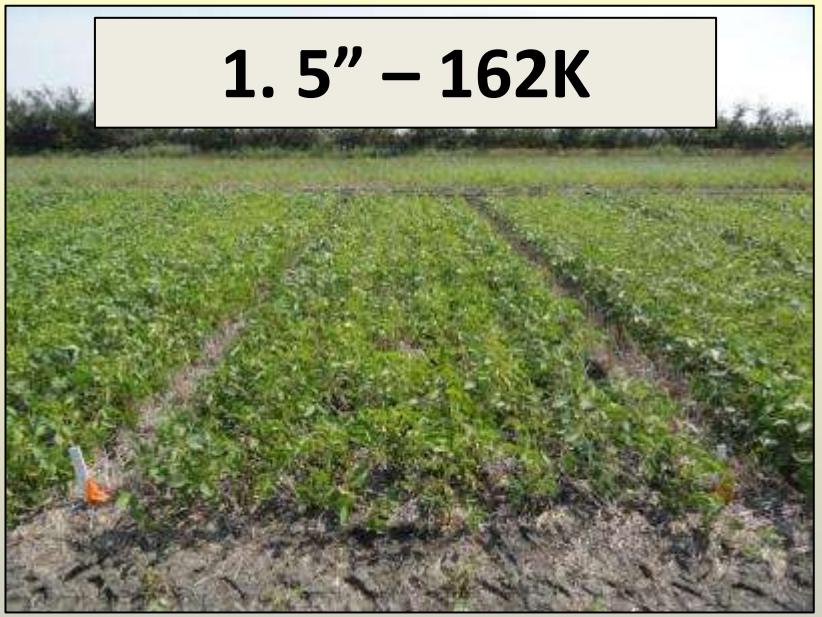
Soybean Seeding Rate & Depth
Effects on Minimum Pod Height



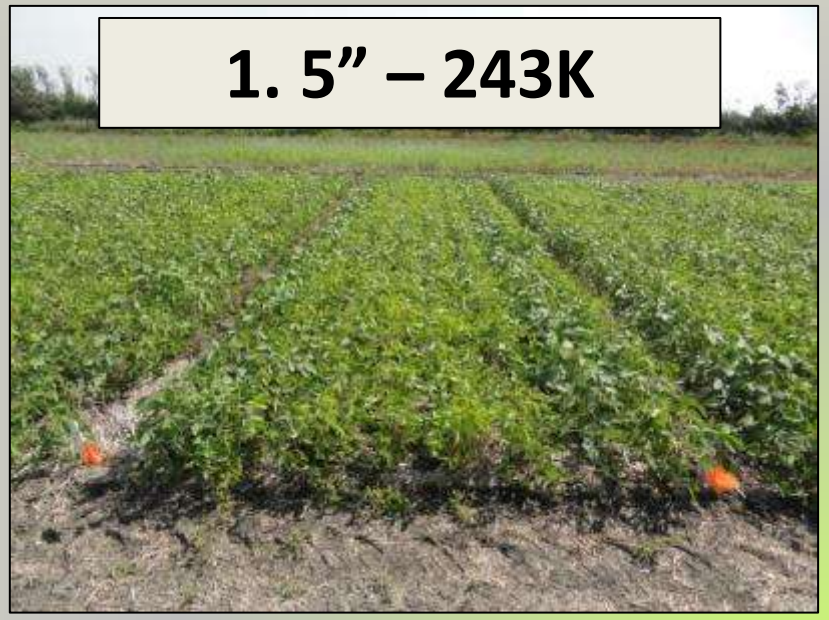
Soybean Seeding Rate & Depth
Effects on Seed Size




0.75” – 162K


1. 5” – 162K

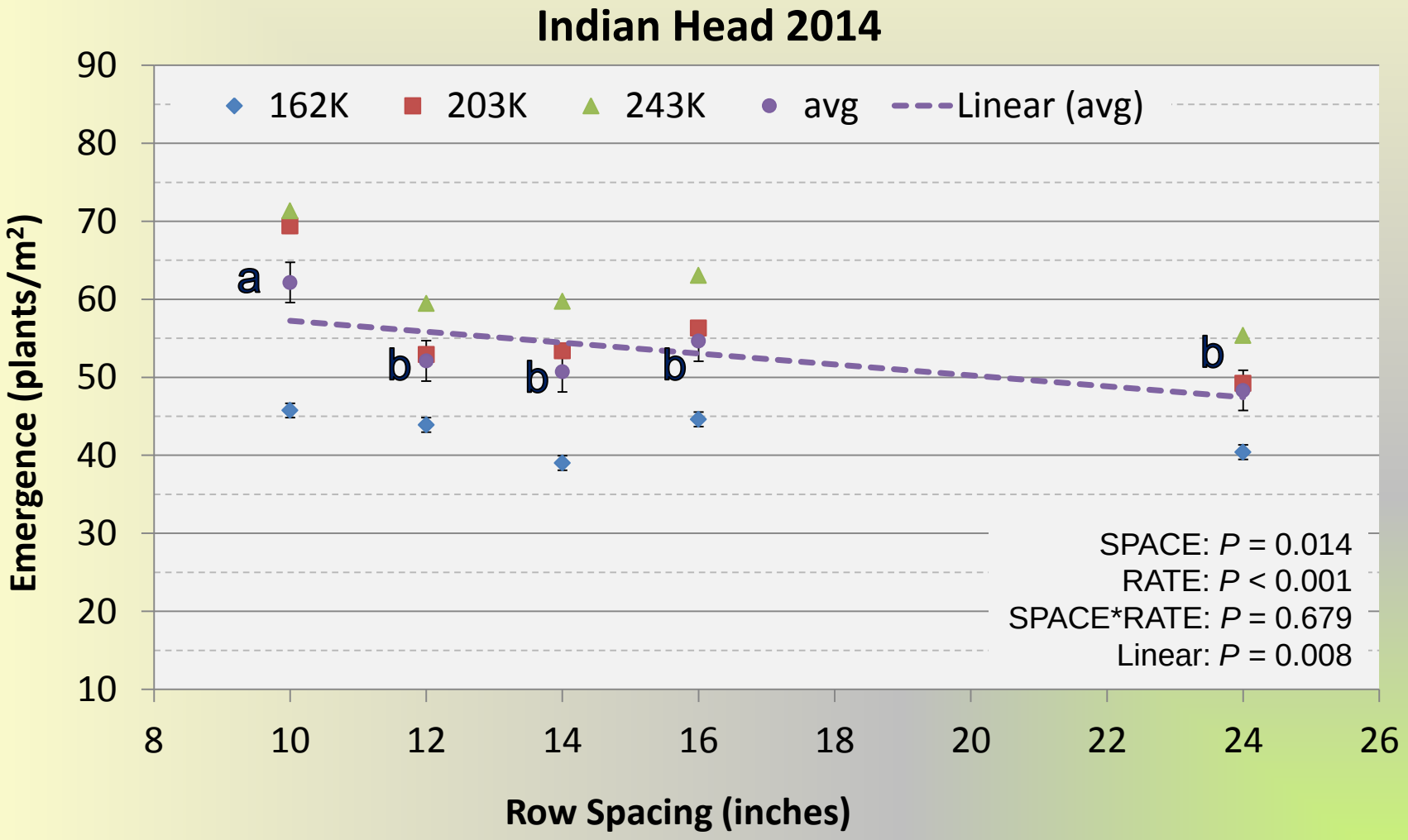

0.75” – 243K


1. 5” – 243K

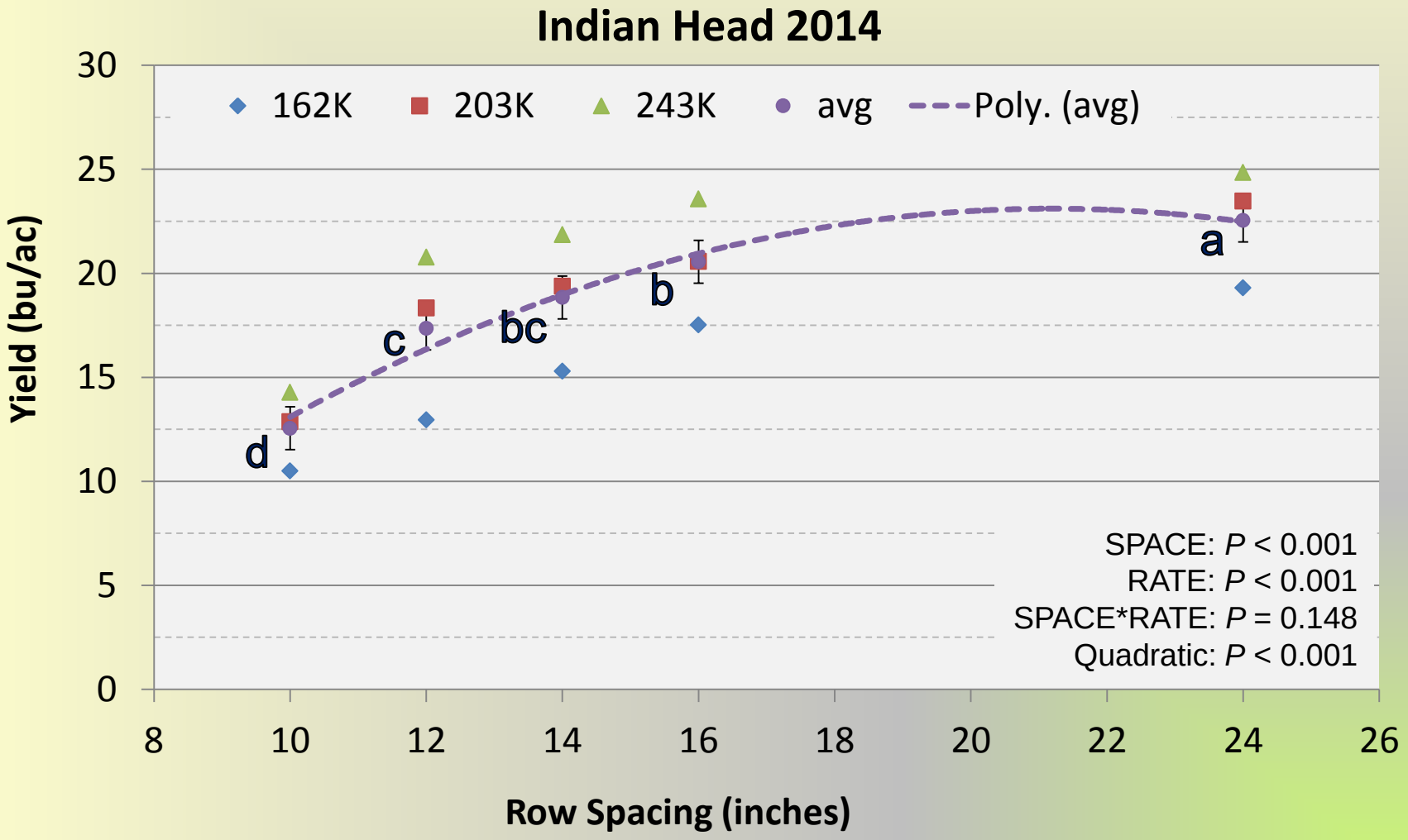
Soybean Row Spacing & Seed Rate
2014 Pulse Science Cluster – GF2

- P002-T04R seeded into barley stubble on May 24
- **Seeding rates of 162K, 203K or 243K seeds/ac**
- **Row spacing of 10”, 12”, 14”, 16” or 24”**
- All seed treated with PPST 120+ inoculant and Evergol Energy seed treatment
- 11-52-0 side-banded to supply 25 lb P_2O_5/ac
- Cell-Tech granular inoculant seed-placed at 3.6 lb/ac
- Early frost on Sept. 10-11, prior to pod colour change
- Straight-combined on Oct. 12

Soybean Row Spacing & Seed Rate
Effects on Emergence



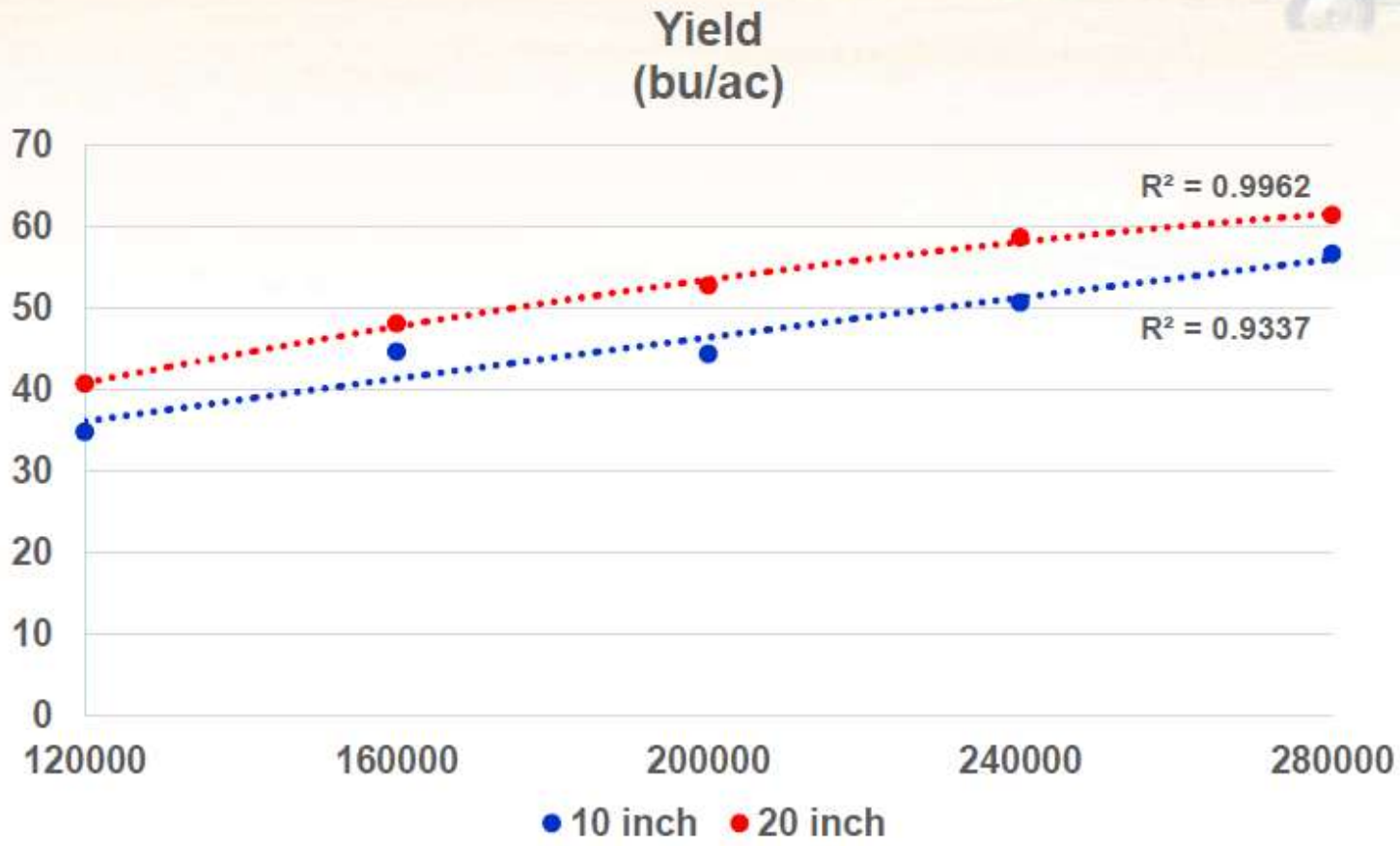
Soybean Row Spacing & Seed Rate
Effects on Seed Yield



10” spacing /243K rate

24” spacing /243K rate

Soybean Plant Population Study



Source: Garry Hnatowich (ICDC)

Soybeans in SK - Take Home Messages

- Choose a very early maturing variety, many are available
- Don't seed too early (May 15-30 and > 10 °C soil)
- Seed < 1" deep at 220-240K seeds/ac – use a land roller
- Well adapted to wider (>12") rows, should perform well within range of 10-24" row spacing (inoculate accordingly)
- Inoculate well – liquid inoculant plus ≥ 2x rate of granular
- Large phosphorus users – highest yields in high P soils, but soybeans respond well to P fertilizer in cool, low P soils
- Starter N? Unlikely to be beneficial under most conditions & with adequate inoculation…more research required
- Expect to harvest in early October

THANK YOU

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