Welcome to the 2020 Crop Opportunity Meeting!

WARC Scott SK

www.warc.ca

@WARC_SK

#CropOpp

What is WARC?

- Non-profit producer based organization
  - Board of Directors of local producers
    - Provide insight into current concerns and interests of local producers
      - Trevor Scherman, Stu Lawrence, Blaine Davey, Sheldon Stang
      - Ryan Charabin, Jeff Hyland, Stacey Sagon, Rob Jones, Justin Askildt
      - Michael Palmier, Mike Bender, Michael Hicks
- WARC Staff
  - Jessica (Weber) Enns – General / Research Manager
  - Kayla Slind – Research Associate (*Maternity leave)*
  - Gurtaj Singh- Executive Administrator
  - Sukhdeep Kaur – Operations Assistant
  - Herb Schell – Seasonal Technical
  - Eric Johnson- Consultant

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- Coldspring Ventures
- Trawin Seeds
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- Diefenbaker Seed
- Rudy Agro Ltd.
- Hemp Genetics International
- Gregoire Seed Farms

Speaker Questions?

Texting QUESTIONS to:

306-361-8703

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Survey Evaluation

Survey evaluations available at:

- Morning, Lunch & Afternoon

www.warc.ca

Survey Template

1. What area are you from (Please list RM or town)?

2. Please indicate which group you identify with

- ◯ Government employee
- ◯ Researcher
- ◯ Private industry agronomist/sales rep
- ◯ Producer
- ◯ Other (please specify)

Survey Template

3. Have you previously attended the Crop Opportunity?

- ◯ Yes
- ◯ No

4. How did you first hear of this event?

- ◯ Word of mouth
- ◯ Facebook
- ◯ Twitter
- ◯ Mail out
- ◯ Newspaper
- ◯ Email notification
- ◯ SIA website
- ◯ Other (please specify)

Done

WHY ARE PULSES SO DIFFICULT TO GROW?

WEEDS? DISEASE?

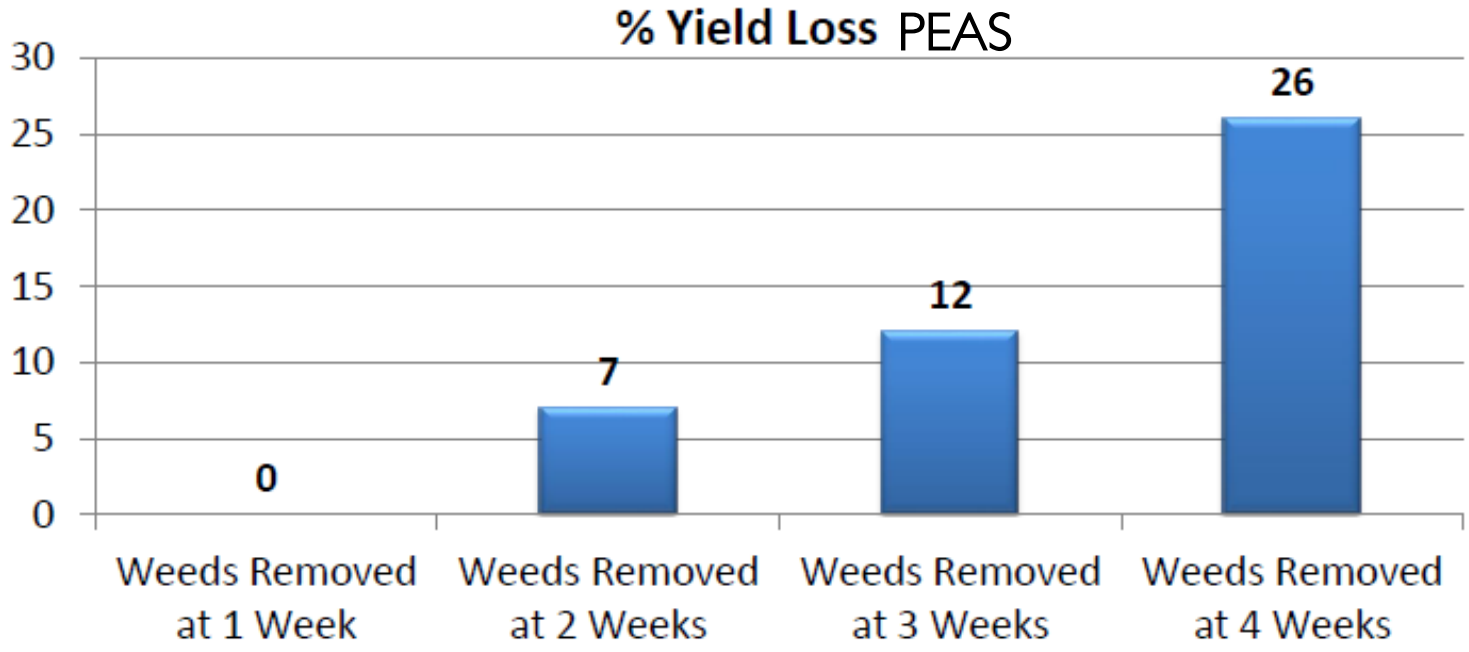
Combination of Both

Requires a combination of agronomy practices

A GLANCE at what's in the WORKS

WEED CONTROL

- Early weed removal is important with poor competitors such as peas and lentils
- 7/10 early applications > yields over later applications (AAFC AB) with PEAS
- CWFP: up to 4 weeks after emergence (peas) and up to 10 node (lentils) (5-10 node)



Source: AAFC Alberta

WEED CONTROL – HERBICIDE LAYERING

Utilizing two to three herbicides **in sequence from different herbicide groups** to tackle tough-to-control weeds and to stave off weed resistance

- Soil residual products and/or burndown options
- Early weed control
- HR management
- Soil activity provides control into growing season
- Better in crop control because weeds smaller

Soil Residual Herbicides	Group
Authority *(sulfentrazone)*	14
Authority Supreme *(sulfentrazone + pyroxasulfone)*	14 + 15
Avadex® *(triallate)*	8
Edge® Granular *(ethalfluralin)*	3
Fierce® *(flumioxazin + pyroxasulfone)*	14 + 15
Focus® *(pyroxasulfone + carfentrazone)*	14 + 15
Sencor® *(metribuzin)*	5
Heat® Complete *(saflufenacil + pyroxasulfone)*	14 + 15
Bonanza® / Rival® / Treflan® *(trifluralin)*	3
Valtera® *(flumioxazin)*	14

Burnoff Herbicides	Group
Aim® *(carfentrazone)*	14
CleanStart® *(glyphosate + carfentrazone)*	9 +14
Express® SG *(triburon)*	2
Glyphosate	9
Goldwing® *(MCPA Ester + pyraflufen-ethyl)*	4 + 14
Heat® *(Saflufenacil)*	14

Not all products registered for both peas and lentils & watch timing restriction (fall vs spring)!

Check labels!

Herbicide Layering Project

- Research conducted throughout the province lead by Dr. Christian Willenborg
  - volunteer canola, kochia and mustard
    - Season long-suppression of wild mustard at Scott & Saskatoon:
      - Metribuzin spring applied
      - Edge (fall) + metribuzin spring applied
      - Pyroxasulfone (fall) + metribuzin spring applied
      - **Combined applications were most efficacious**

Growing Forward 2
A federal-provincial-territorial initiative

Canada

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AgriARM
Applied Research Management

ADOPT
Agriculture Demonstration of Practices & Technology

Saskatchewan Pulse Growers

UNTREATED CHECK

28 DAE

56 DAE

FALL PYROXASULFONE (ZIDUA)

28 DAE

56 DAE

FALL PYROXASULFONE & SPRING METRIBUZIN

ZIDUA & SENCOR

28 DAE

56 DAE

LENTIL INPUT STUDY (SMALL RED)

Collaborators: Chris Holzapfel, Michael Hall, Bryan Nybo, Garry Hnatowich, Eric Johnson and Dr. Steve Shirtliffe

Lentil Input Study (small red)

Factor One: Weed Control

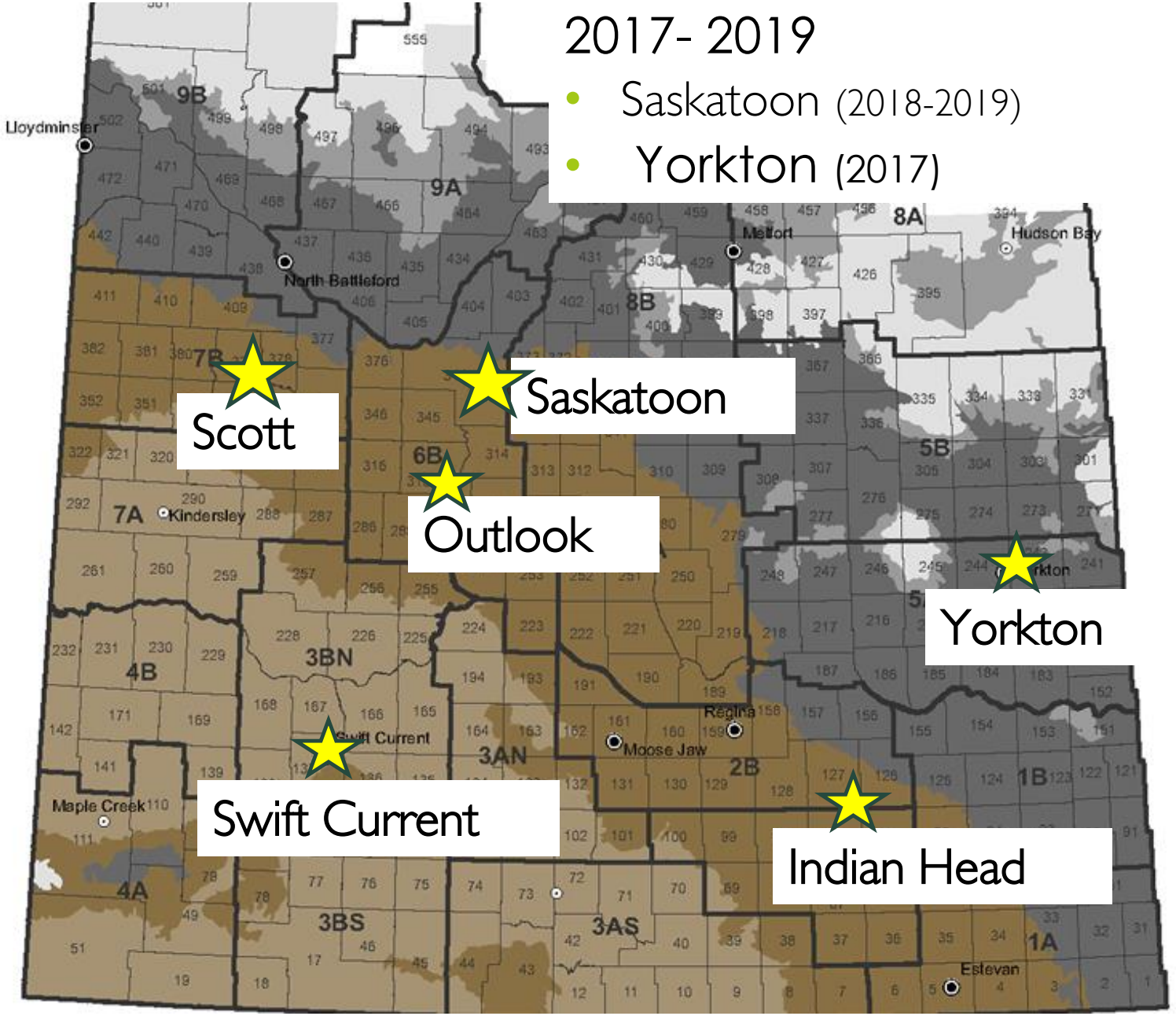
- Pre-seed burn off (glyphosate)
- Pre-seed residual (Focus)

Factor Two: Seeding Rate

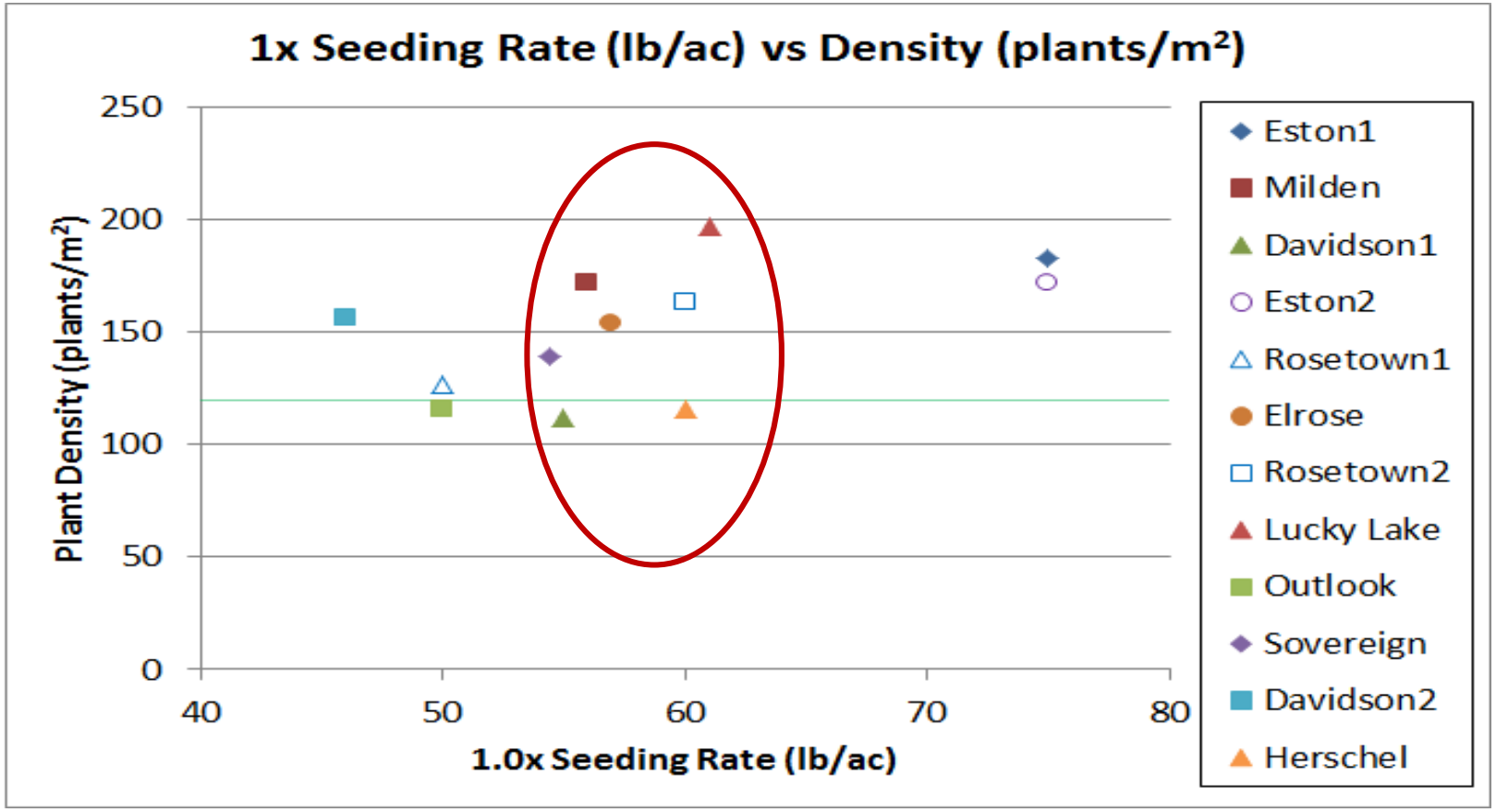
- 130 viable seeds/m^2 (40lb/ac ; 0.67 bu/ac)
- 190 viable seeds/m^2 (60lb/ac ; 1 bu/ac)
- 260 viable seeds/m^2 (80 lb/ac ; 1.3 bu/ac)

Factor Three: Disease Control

- No Fungicide
- Single
- Dual



SEEDING RATES



Crop	Target plant population (#/m²)	Seed Size (TKW in g)
Lentil	120 – 130 (190-210 new)	26 – 73
Pea	75 - 85	150 – 280

$$\text{Seeding Rate (kg/ha)} = \frac{\text{Target Plant Stand x Seed Size (TKW)}}{\text{(\% Emergence)}}$$

Lentil Input Study

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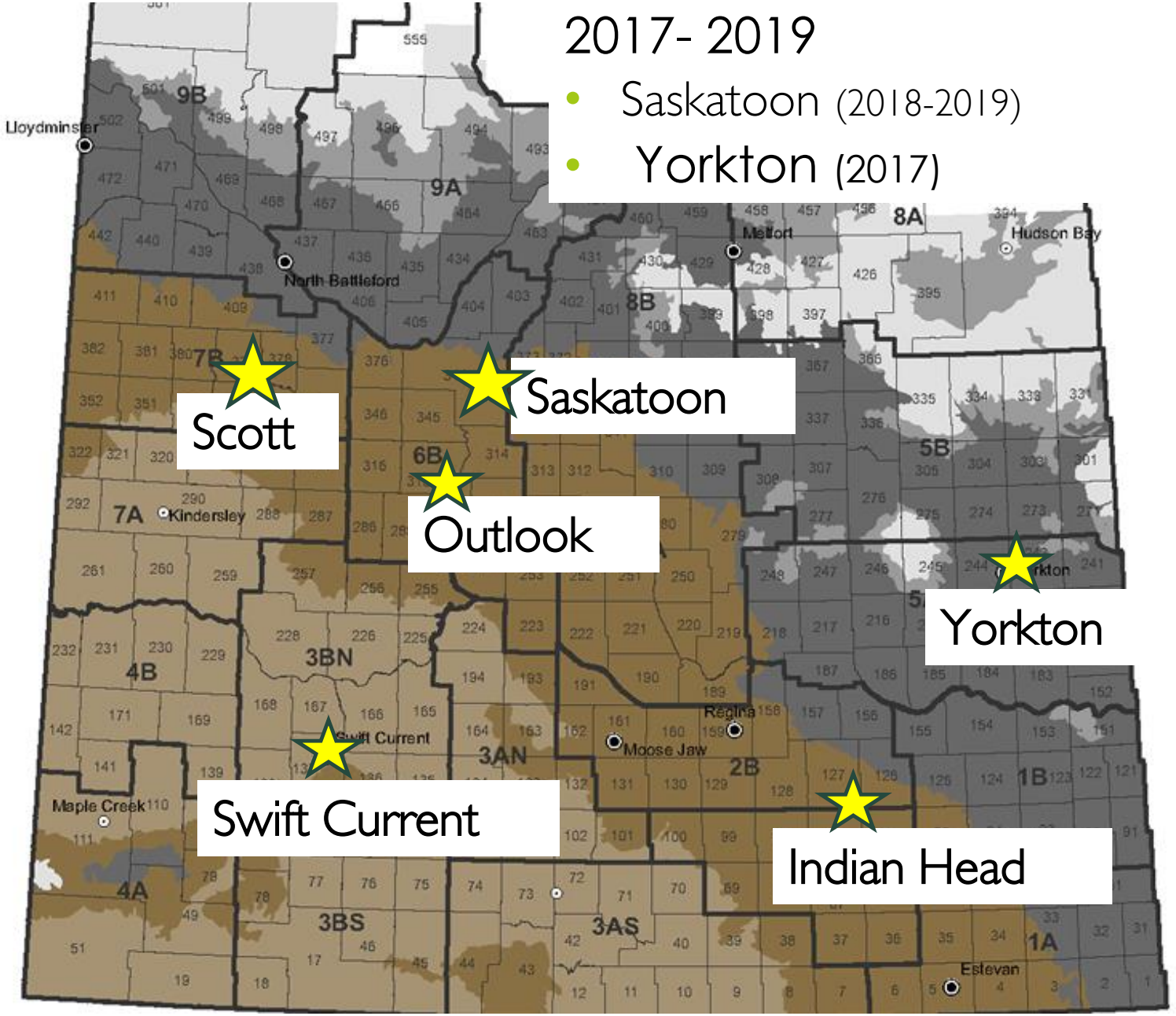

% Weed control of residual herbicide relative to burnoff

*Preliminary Results

Residual herbicide was effective **71%** of the time

10 / 14 site years

- **66%** increase in annual weed control
  - Volunteer canola, Kochia, Cleavers
  - Wild oats, Green foxtail

Residual herbicide not effective **29%** of the time

4 / 14 site years

- Weeds not in control spectrum
- Glyphosate provided great control
- Limited secondary flushes
- Poor soil activation

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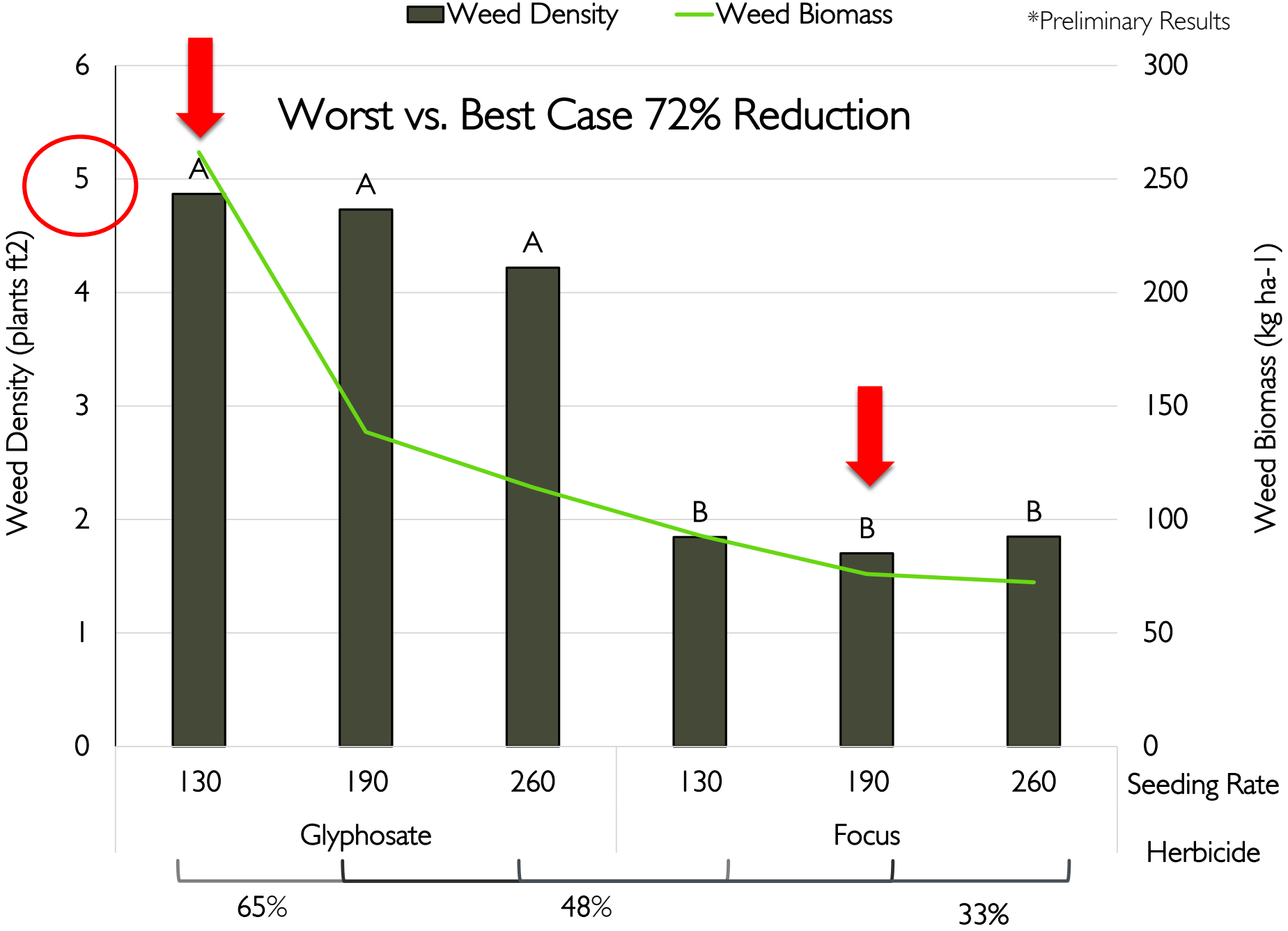
13 Site - Years
*Preliminary Results



5 pl/ft2

Standard (130 seeds/m2 & Glyphosate) **5% Yield Loss**

Vs.

Enhanced (190 seeds/m2 & Focus) **1% Yield Loss**

10 pl/ft2

Standard (130 seeds/m2 & Glyphosate) **9.5% Yield Loss**

Vs.

Enhanced (190 seeds/m2 & Focus) **3% Yield Loss**

15 pl/ft2

Standard (130 seeds/m2 & Glyphosate) **14% Yield Loss**

Vs.

Enhanced (190 seeds/m2 & Focus) **4% Yield Loss**

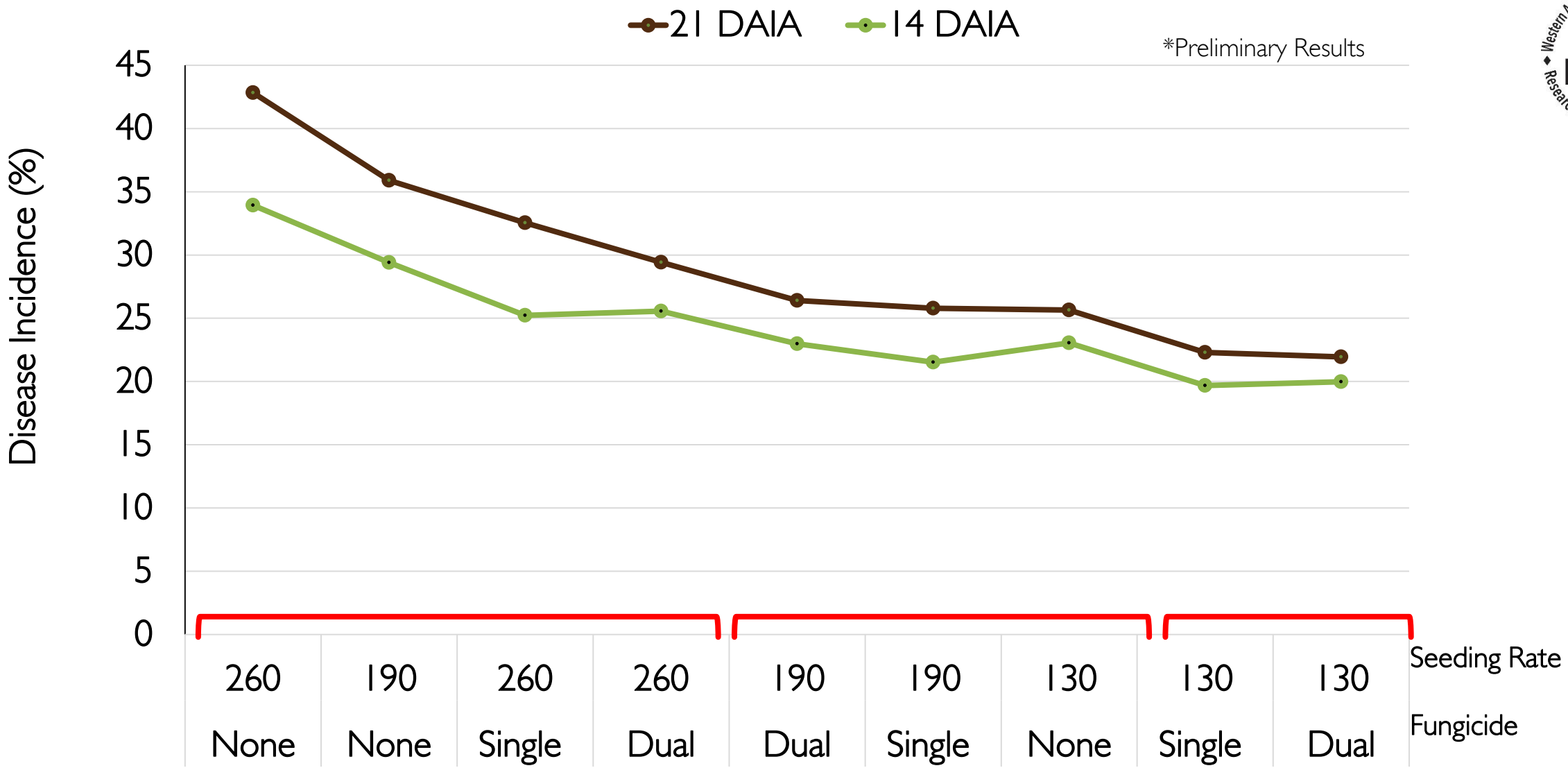
30 pl/ft2

Standard (130 seeds/m2 & Glyphosate) **28% Yield Loss**

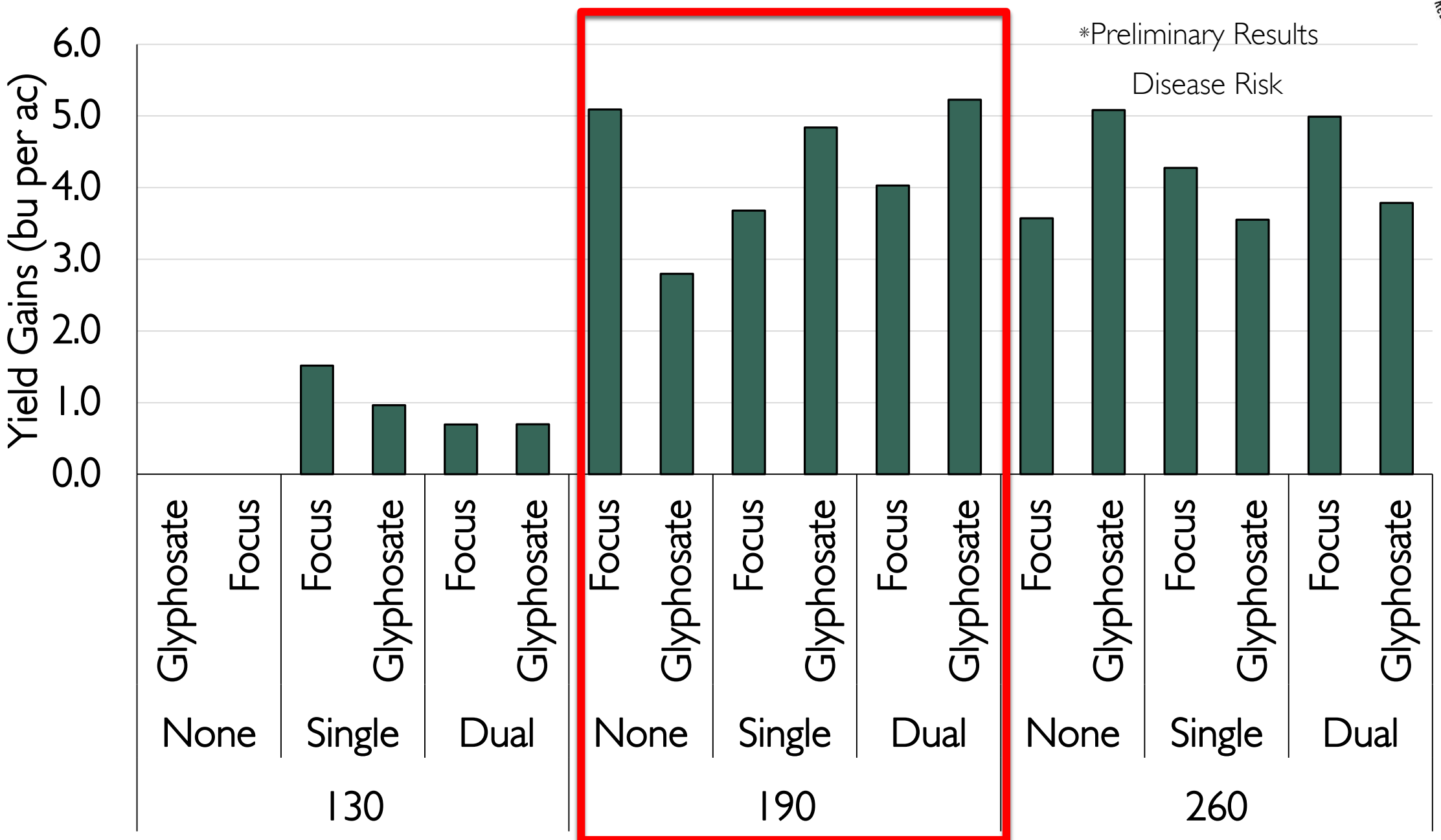
Vs.

Enhanced (190 seeds/m2 & Focus) **8% Yield Loss**

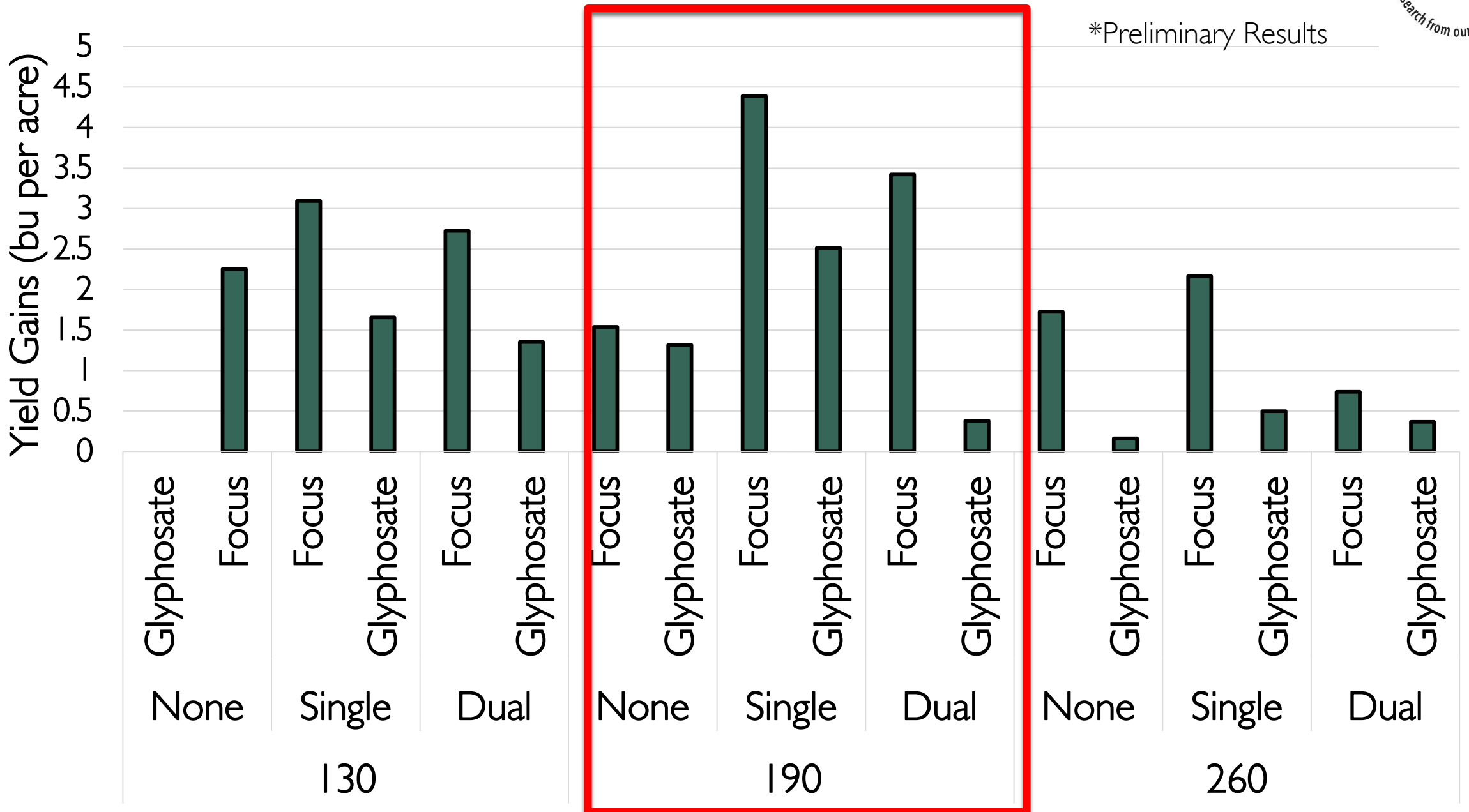
EFFECT OF SEEDING RATE & APPLICATION TIMING ON DISEASE INCIDENCE



HIGH YIELDING (9/15 SITE YEARS)



LOW YIELDING (6/15 SITE YEARS)



Revenue (%) impact as weed populations increase

Low- Yielding Sites (6/15 Sites)

Seeding Rate (seeds/m^2)	Herbicide	5 Pl/ft^2	10 Pl/ft2	15 Pl/ft^2	20 Pl/ft^2
			% Diff. in Revenue		
130	Glyphosate vs Glyph. + Focus	-2.1	7.8	14.0	20.9
190	Glyphosate vs Glyph. + Focus	4.2	14.1	20.3	27.2
260	Glyphosate vs Glyph. + Focus	1.2	12.3	19.2	26.9

High- Yielding Sites (9/15 Sites)

5 Pl/ft^2	10 Pl/ft2	15 Pl/ft^2	20 Pl/ft^2
	% Diff. in Revenue		
-2.9	5.3	10.3	15.8
-2.7	5.5	10.5	16.1
-2.3	6.1	11.2	16.9

SMALL RED LENTIL BEST MANAGEMENT PRACTICE

Seeding Rate:

- 190 > 260 > 130 viable seeds/m^2 under "good" conditions
- 190 > 130 > 260 viable seeds/m^2 under "poor" conditions

*Preliminary Results

Residual herbicides:

- was effective 71% of the time
- 65% reduction in weed establishment
- 72% reduction in weed biomass
- $$ Profit at plant densities >5 weeds/ft2

Fungicide:

- 260 < 190 ≤ 130 unsprayed < 130 single/ dual
- Dry conditions: 1 pass
- Wet conditions: 2 passes ?

Overall - Increased seeding rate (190) + residual herbicide + single fungicide

MANAGEMENT STRATEGIES TO IMPROVE FIELD PEA ROOT HEALTH IN APHANOMYCES CONTAMINATED SOILS

Evaluating combinations of various management strategies to reduce the impact

1. Pre-seed herbicides- application of a dinitroaniline herbicide inhibited the production of motile zoospores to delay infection
2. Increased available nutrients- to boost early development & improve growth through to improve tolerance
3. Seed treatments- targets root rot complexes to improve tolerance

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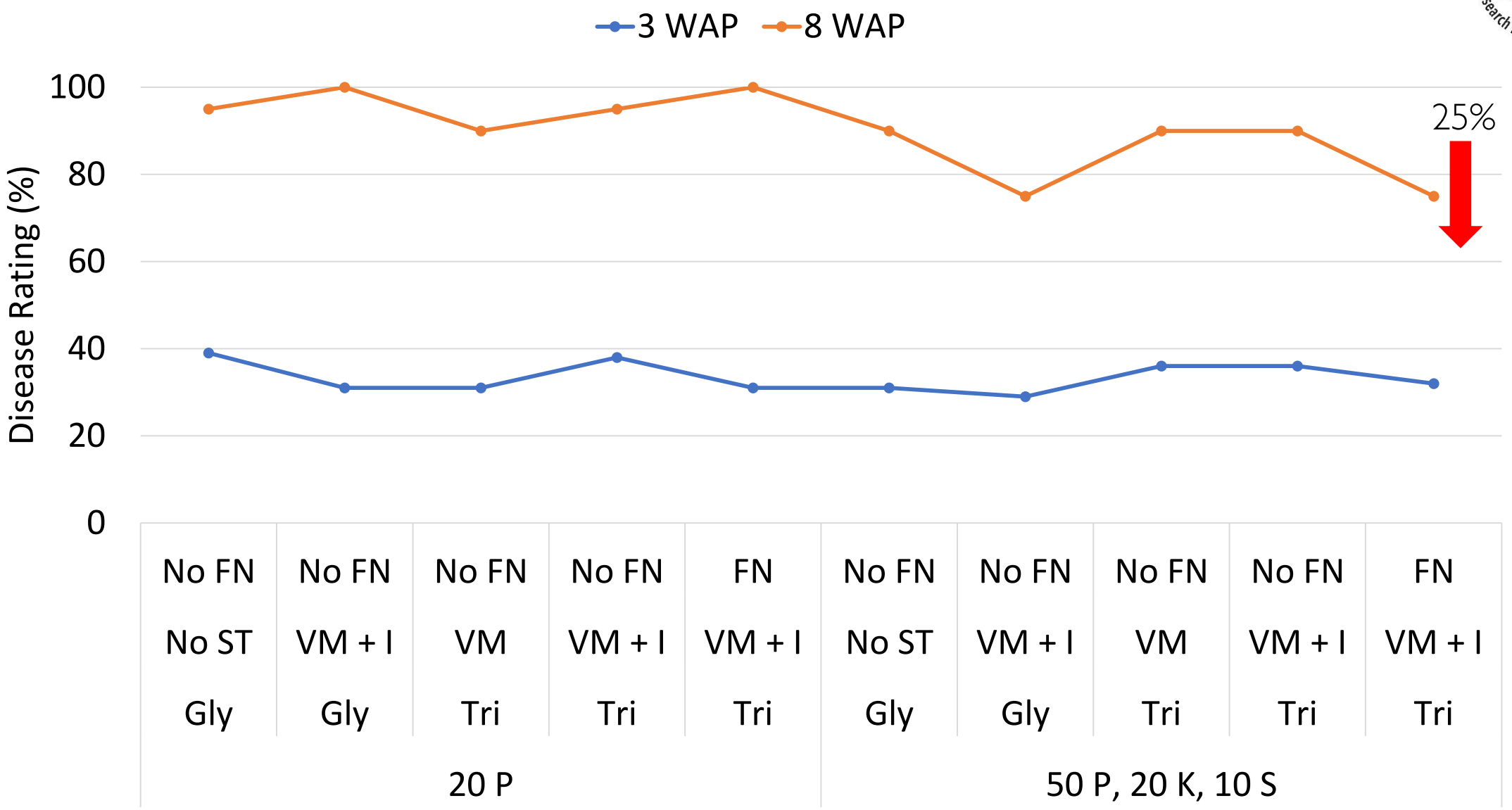
TRT #	Herbicides	Starter Fertilizer lb/ac	Seed Treatment	Foliar nutrient
1	Glyphosate	4N,20 P	no	no
2	Glyphosate	4N,20 P	vibrance maxx + intego	no
3	Glyphosate + trifluralin	4N,20 P	vibrance maxx	no
4	Glyphosate + trifluralin	4N,20 P	vibrance maxx + intego	no
5	Glyphosate + trifluralin	4N, 20 P	vibrance maxx + intego	yes
6	Glyphosate	20 N, 50 P, 20 K, 10 S	no	no
7	Glyphosate	20 N, 50 P, 20 K, 10 S	vibrance maxx + intego	no
8	Glyphosate + trifluralin	20 N, 50 P, 20 K, 10 S	vibrance maxx	no
9	Glyphosate + trifluralin	20 N, 50 P, 20 K, 10 S	vibrance maxx + intego	no
10	Glyphosate + trifluralin	20 N, 50 P, 20 K, 10 S	vibrance maxx + intego	yes

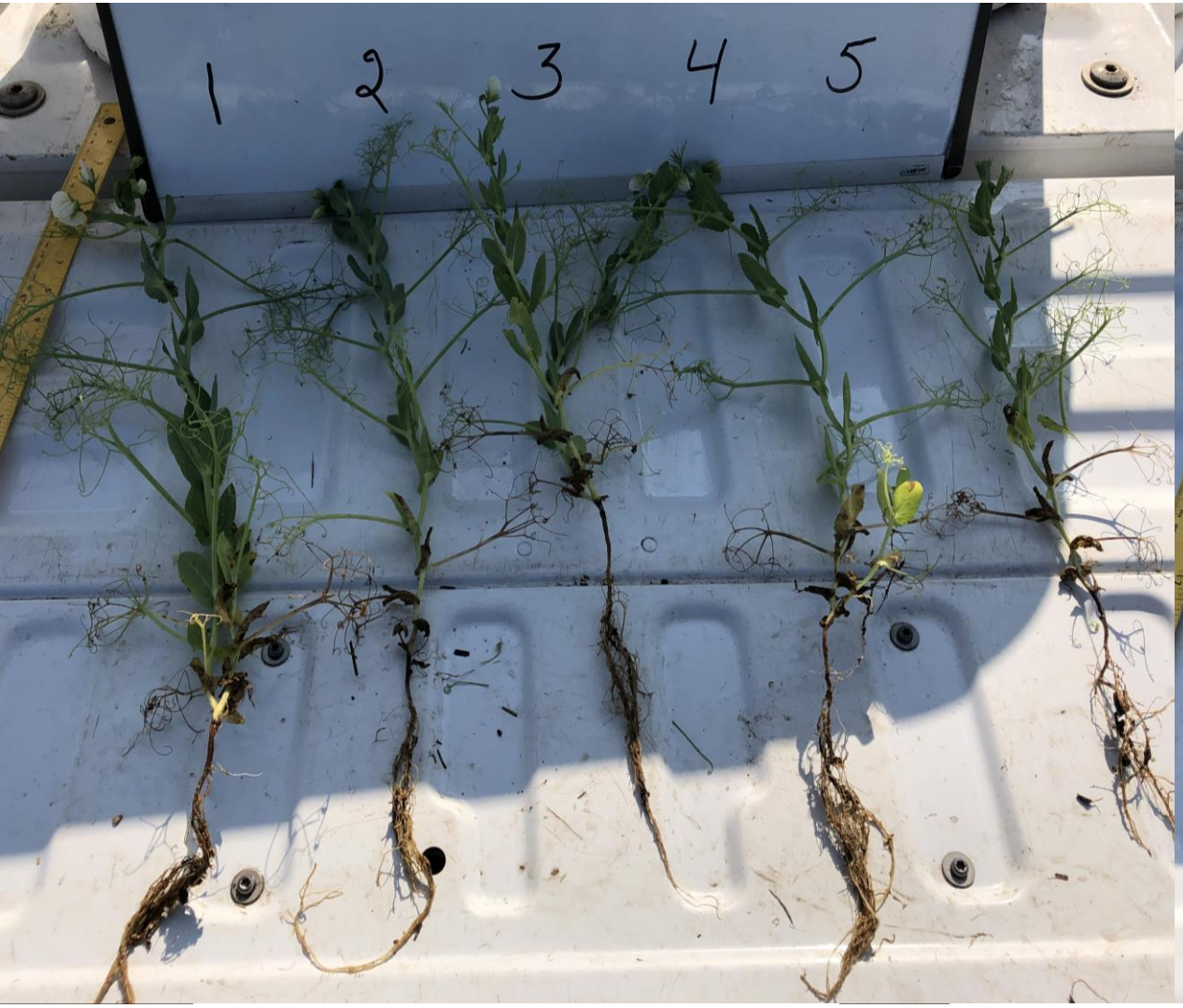
Trifluralin = Treflan/Rival/Bonanza

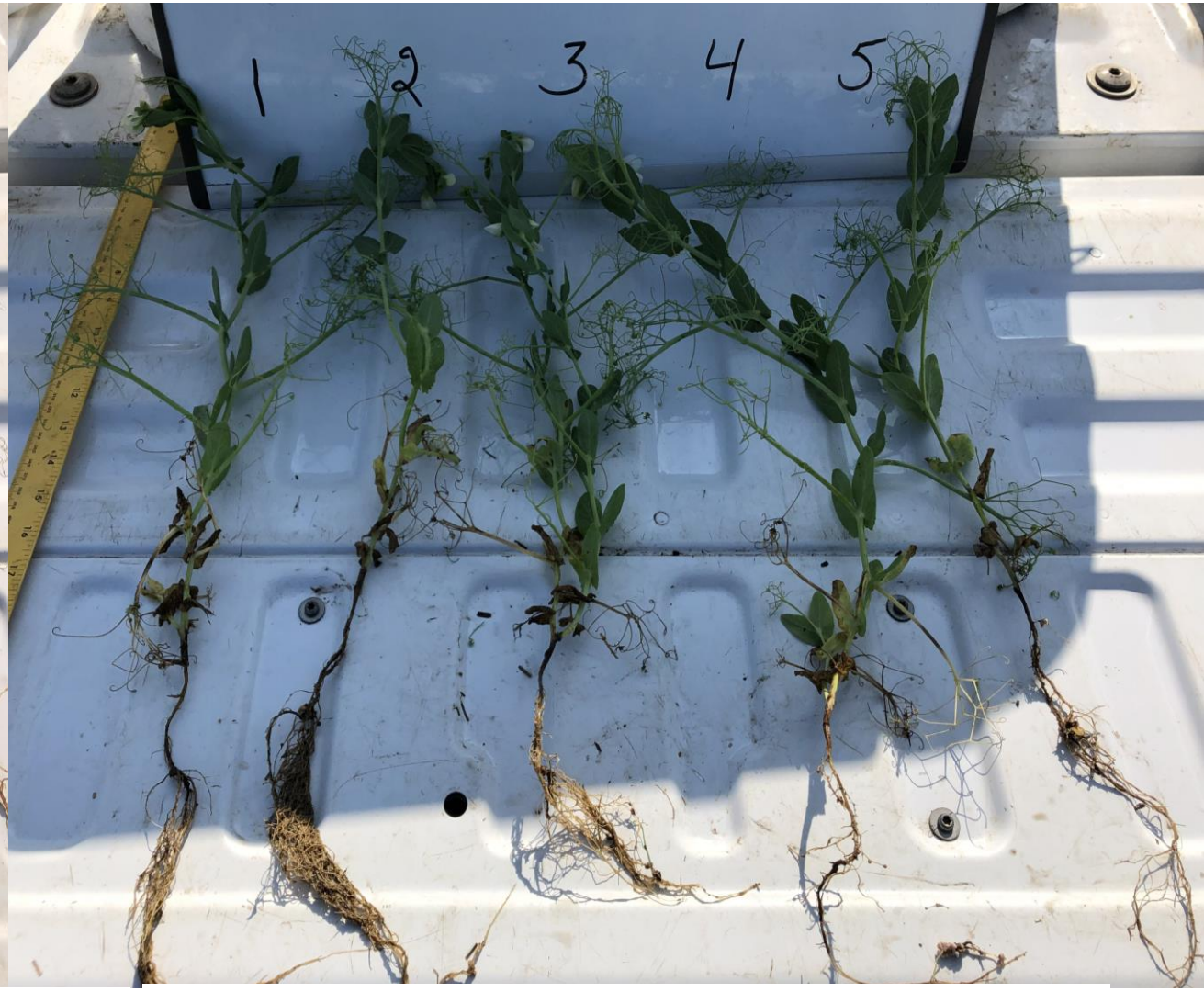
Preliminary Data



Gly= Glyphosate, Tri= Trifluralin, ST= Seed Treatment, VM= Vibrance Maxx, I= Intego, Fn= Foliar Nutrient

Scott, 2019 @ 8 Weeks After Planting





Gly + 20 P, No, ST/FN vs TRI + 50 P,20K,10S, VM+ I + FN

2 or more inputs most effective

Most common factors that influenced yield: **Fertility**, **herbicide**, & **seed treatment**

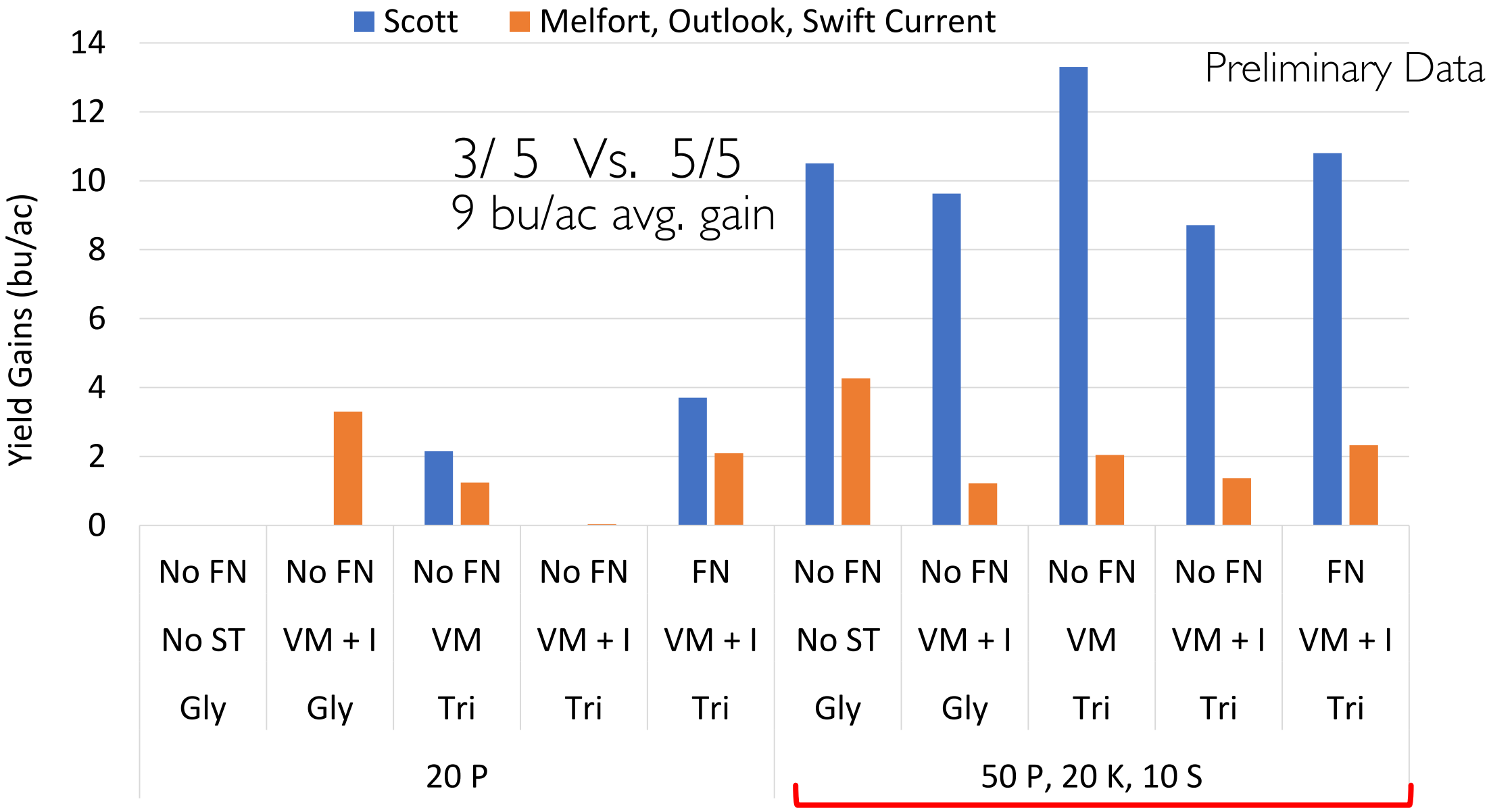
Inconsistent responses among sites

- **Fertility** (low vs high)
  - available P can increase early season vigor and improve tolerance to disease
    - Great extent at Scott and to a lesser extent at Melfort, Swift Current, Outlook

- **Herbicide** (glyphosate vs. trifluralin)
  - delay infection and improved plant tolerance
    - 2 highest yields at Scott & highest at Swift Current
    - third & fourth highest yields at Outlook & Melfort

- **Seed treatment** (none vs. Vibrance Maxx vs. Vibrance Maxx + Intego)
  - Only positive benefit noted at Swift Current
    - Limited efficacy could be attributed to dry spring

Scott Significant (P=0.0132)
Other Sites = NS



Gly= Glyphosate, Tri= Trifluralin, ST= Seed Treatment, VM= Vibrance Maxx, I= Intego, Fn= Foliar Nutrient

Basic Strategy

- Glyphosate
- 20 P lbs/ac
- No Seed Treatment
- No Foliar Nutrients

Intensive Strategy

- Glyphosate + Trifluralin
- 20N, 50 P, 20 K, 10 S lbs/ac
- Seed Treatment
  (Vibrance Maxx + Intego)
- Foliar Nutrients

MANAGEMENT STRATEGIES IN APHANOMYCES INFECTED SOILS

Effective and profitable management strategies:
(1) proper fertilization (higher than the current standard of 20 lb/ac of P_2O_5)
(2) applications of trifluralin to reduce disease and weed pressure
(3) the application of seed treatments in a wet, cold spring

Combining multiple techniques may prove useful as the combination of delayed infection and improved disease tolerance may result in more robust plants.

Most Profitable:

- Gly+ high fertility (50 P, 20 K, 10 S)
- Trifluralin + high fertility (50 P, 20 K, 10 S) + Vibrance Maxx *most promise

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