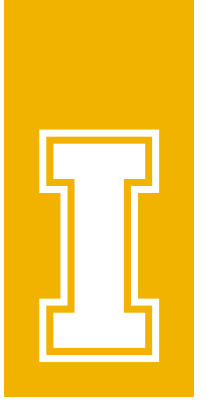




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PINK ROOT MANAGEMENT

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🏠 / EXTENSION / PUBLICATIONS /

Pink Root Disease of Onion — Biology and Control

Technical Staff



<https://www.uidaho.edu/>

PINK ROOT

- Caused by the soil born fungus *Setophoma terrestris*.
- Soil temperatures above 70F are optimum for infection.
- Inoculum survives for long periods in soil, and pathogen has a wide host range = rotation is moderately effective.
- **Host resistance and fumigation are primary means of control.**



PINK ROOT CONTROL IS COSTLY



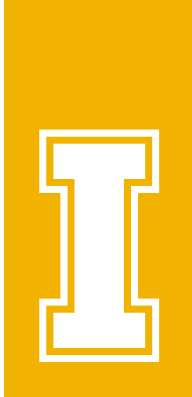
- Application costs ~ \$400 per acre
- Sustainability:
 - 4 gal CP = 55 lbs a.i. per acre
 - 50 gal Metam = 213 lbs a.i. per acre



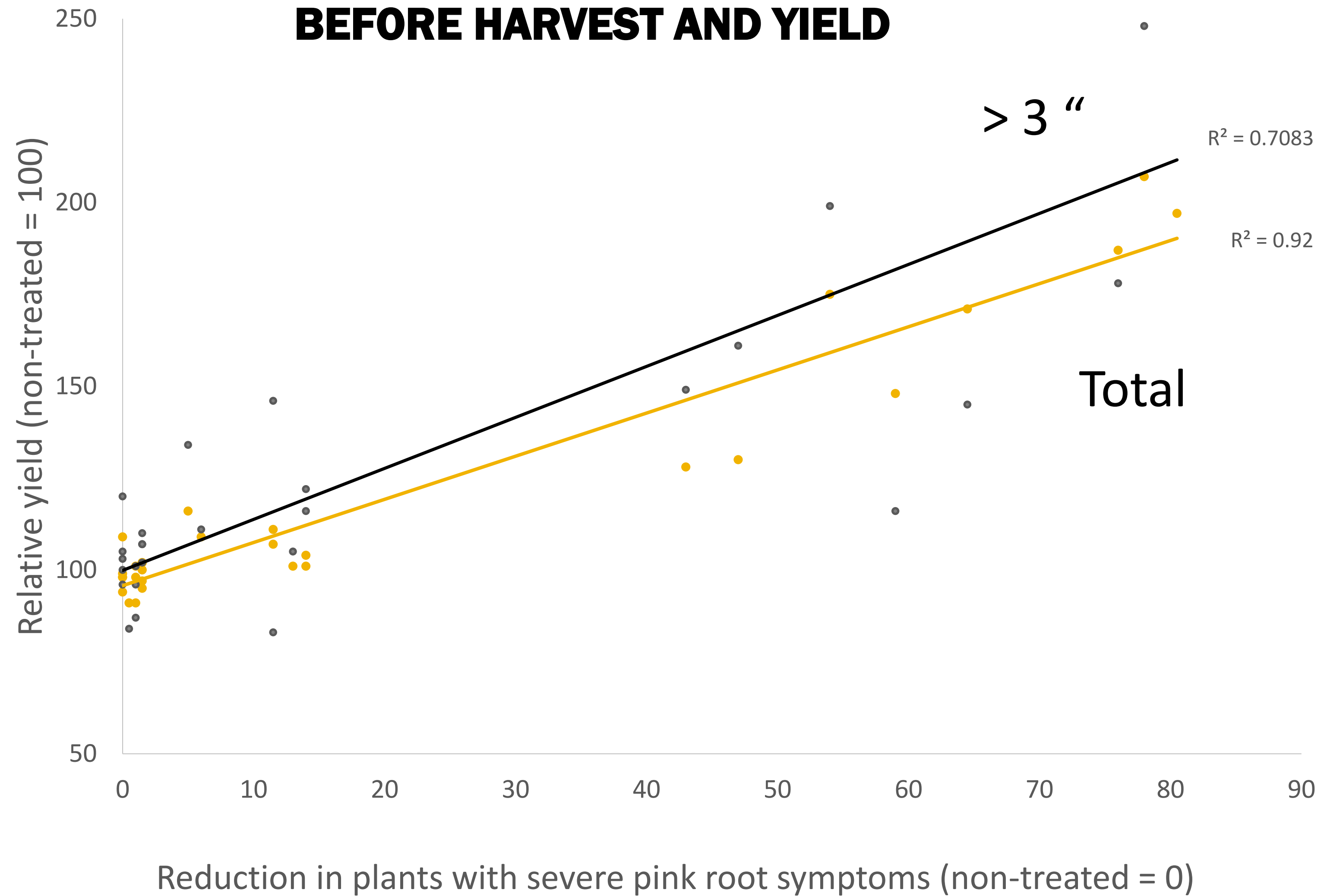
(application timing, number, rates,
combinations of fungicides/fumigants)

**We have evaluated control
options for 30+ years**

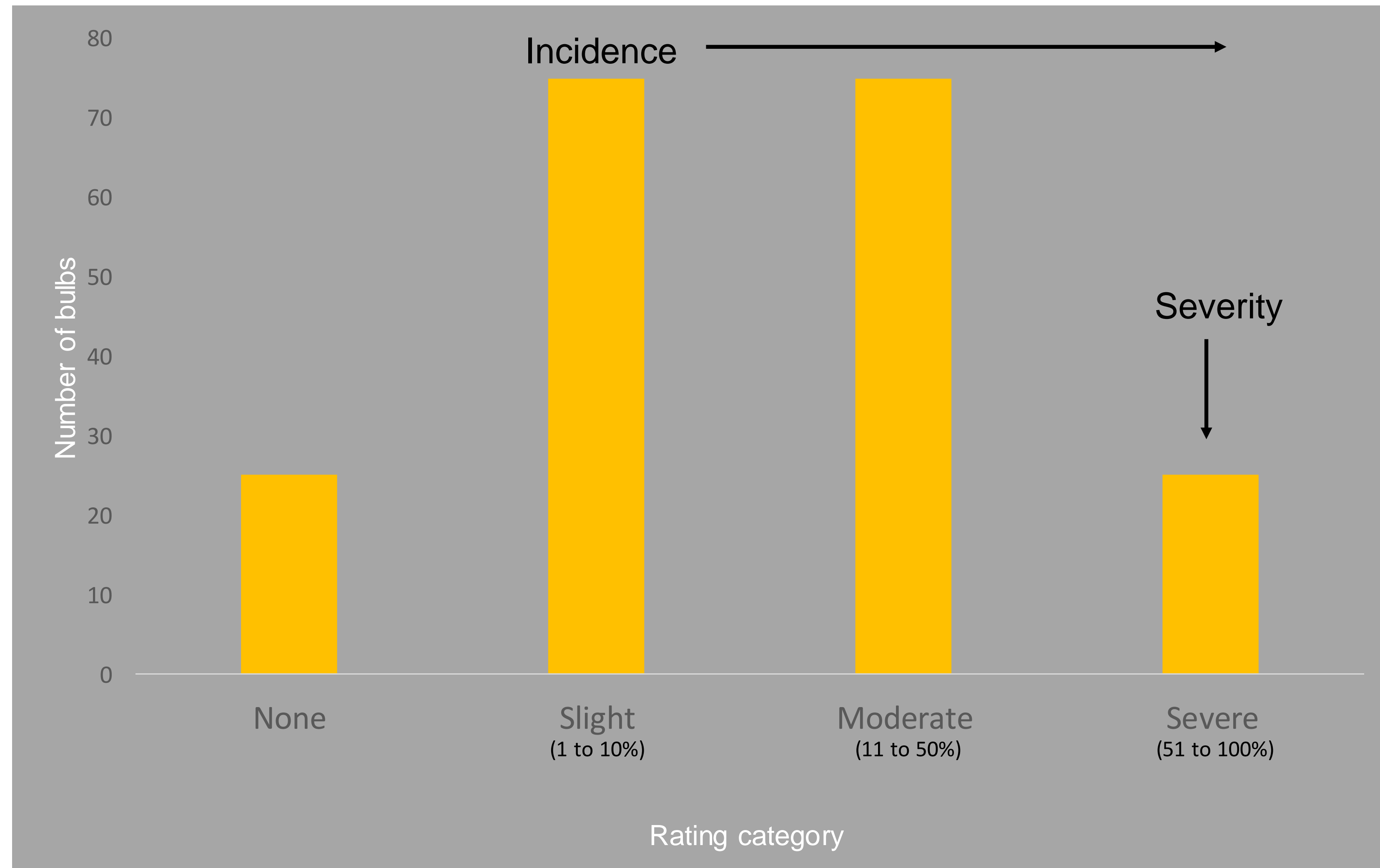




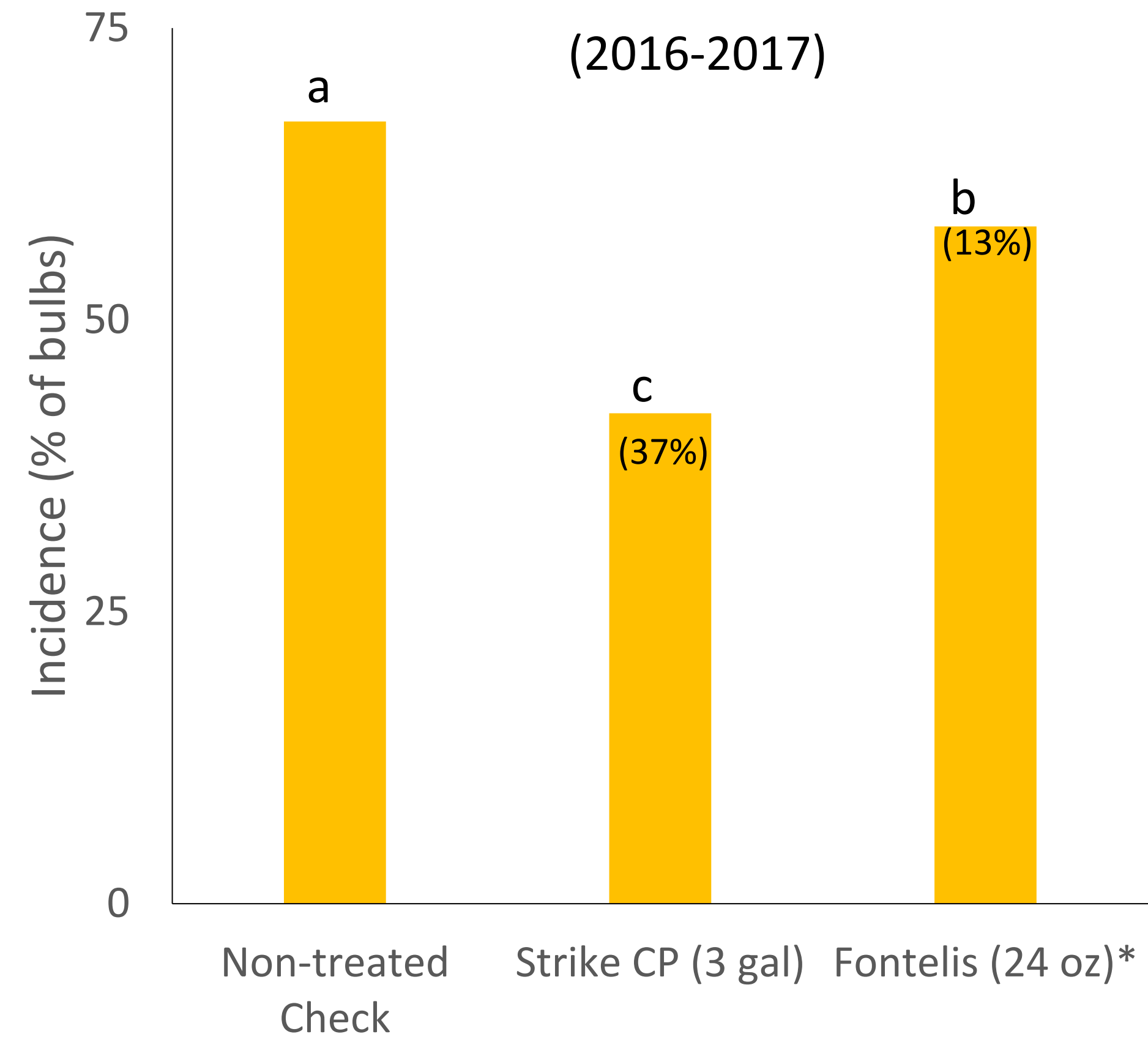
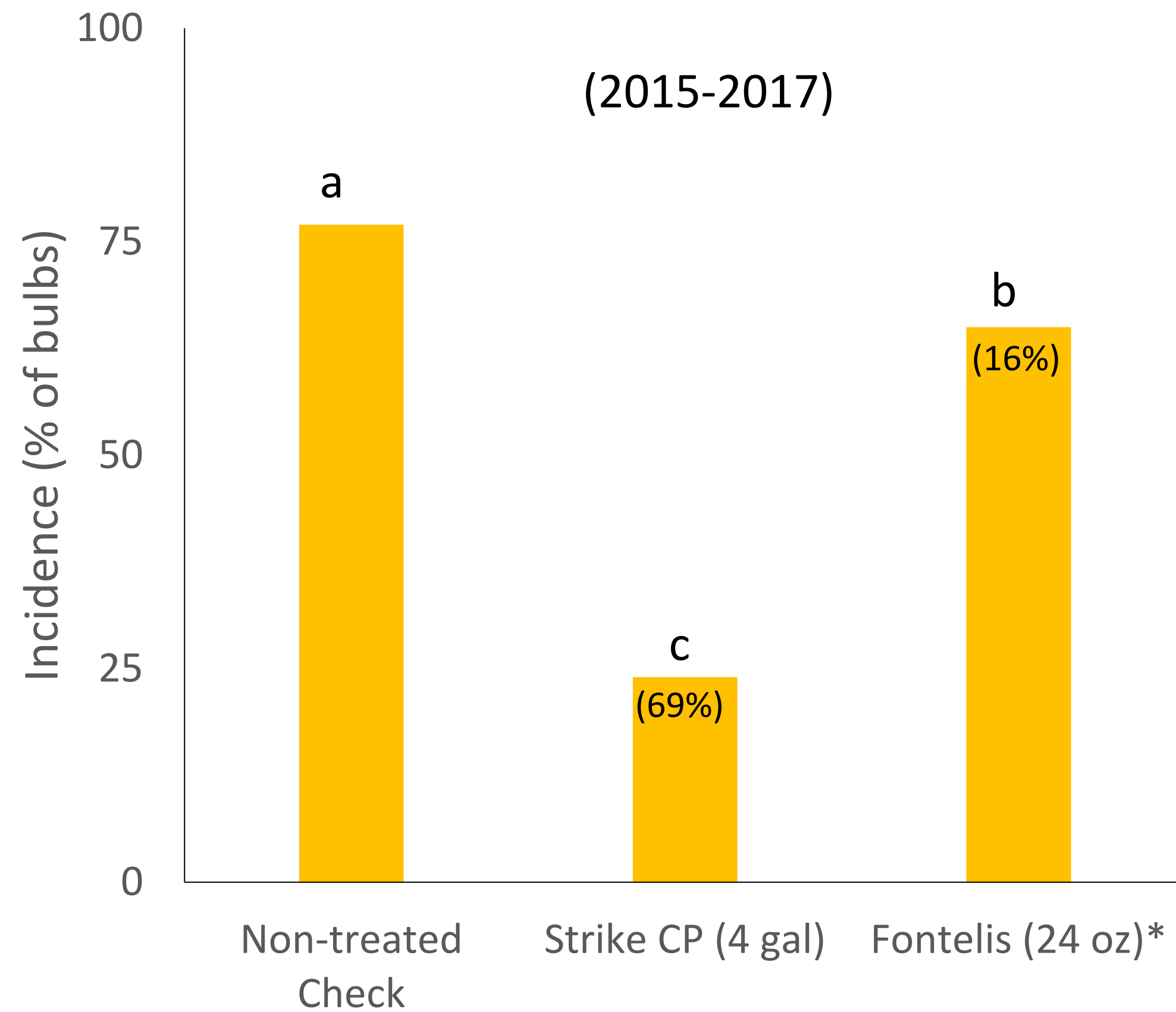
STRONG RELATIONSHIP BETWEEN SEVERITY ~ 1 MONTH BEFORE HARVEST AND YIELD



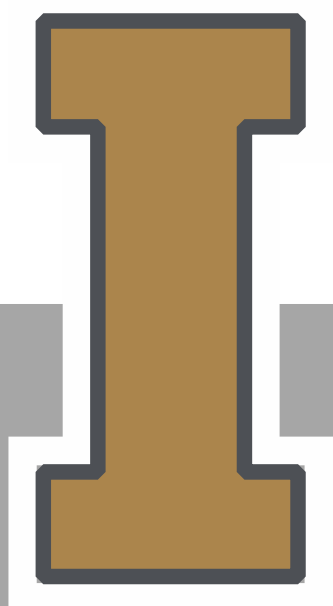
PINK ROOT RATING



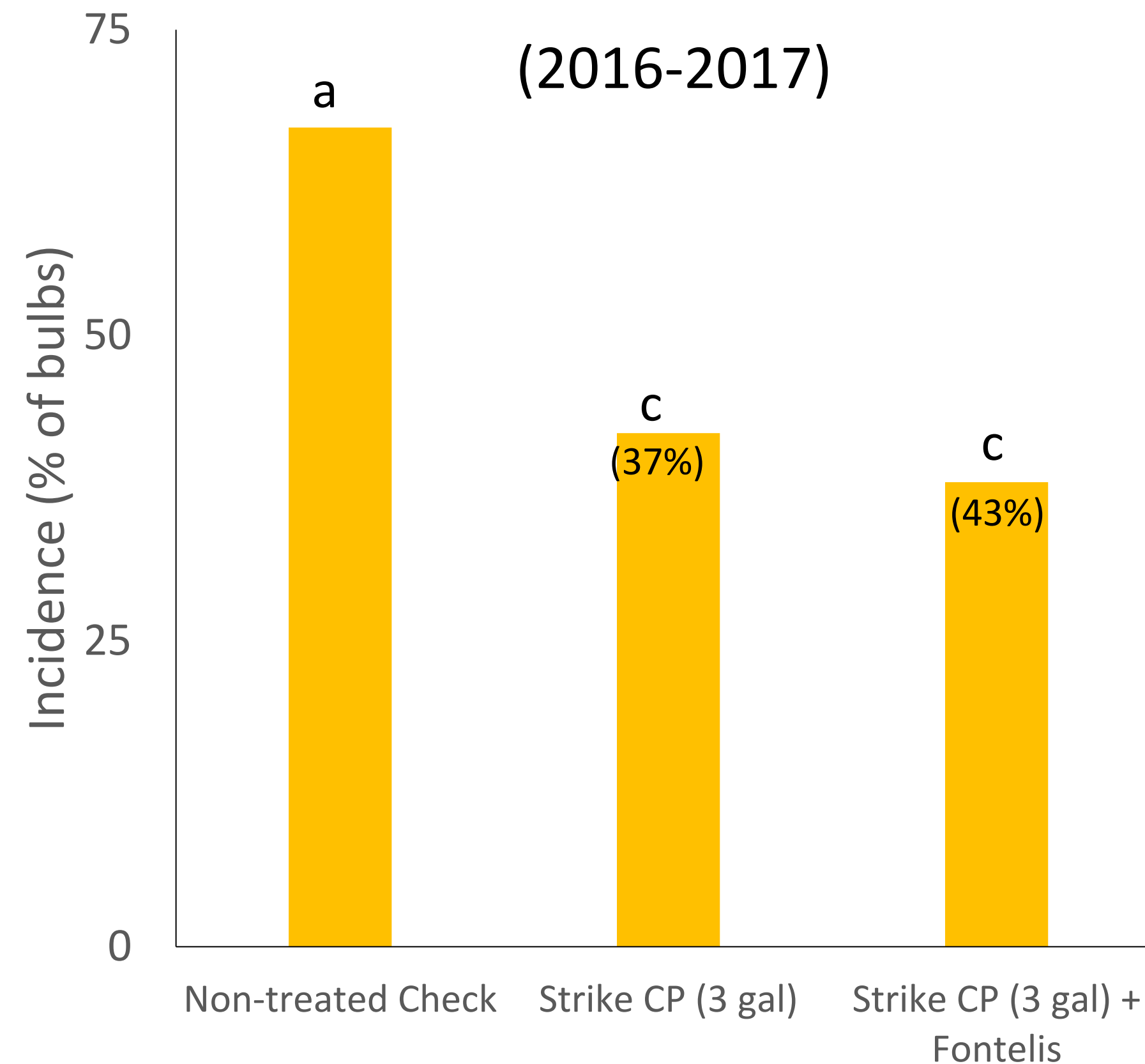
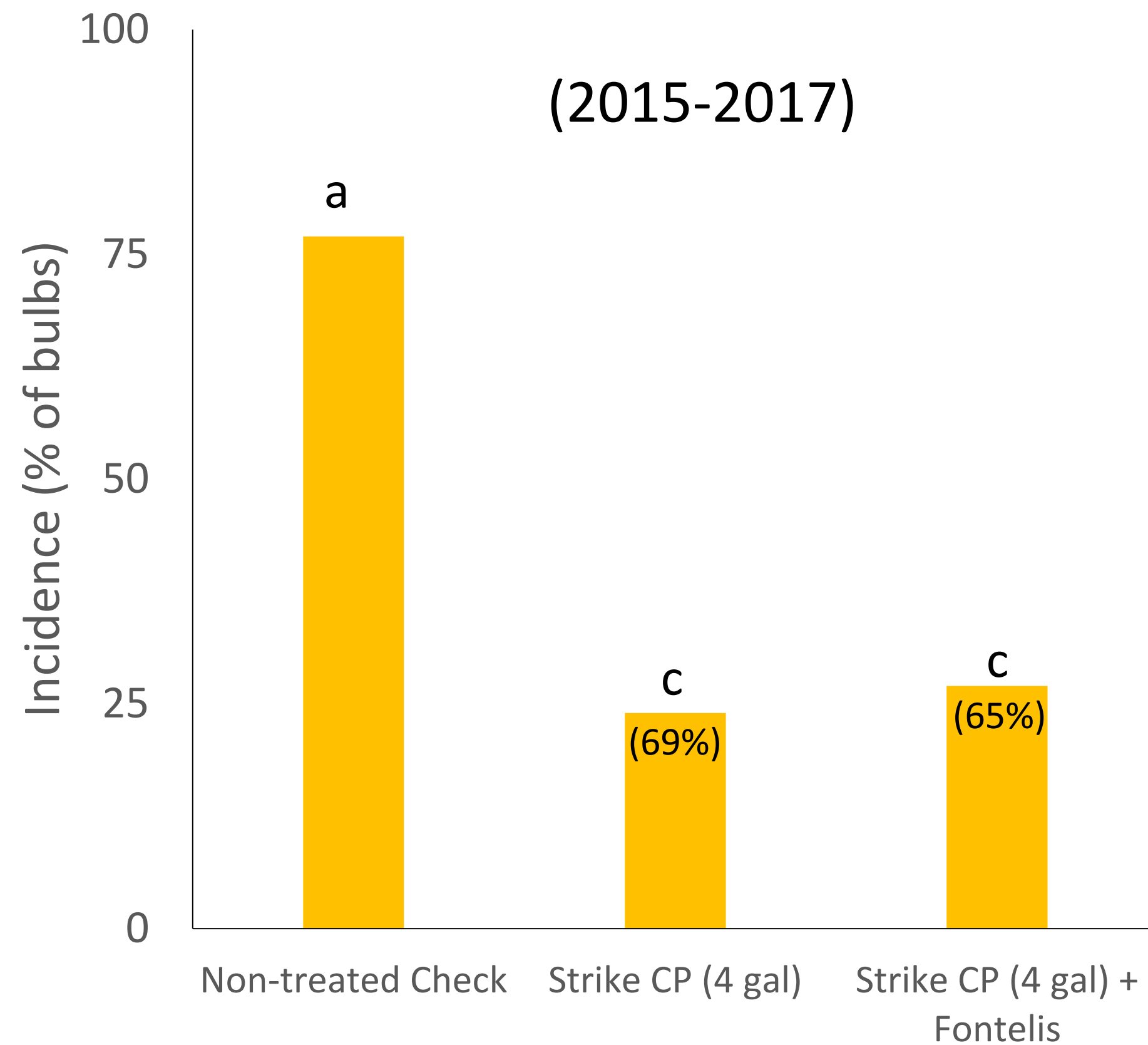
COMPARISON OF FUMIGATION TO FONTELIS



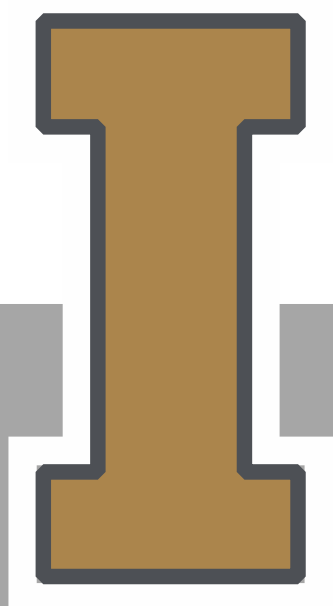
* Applied via drip at 2 leaf stage



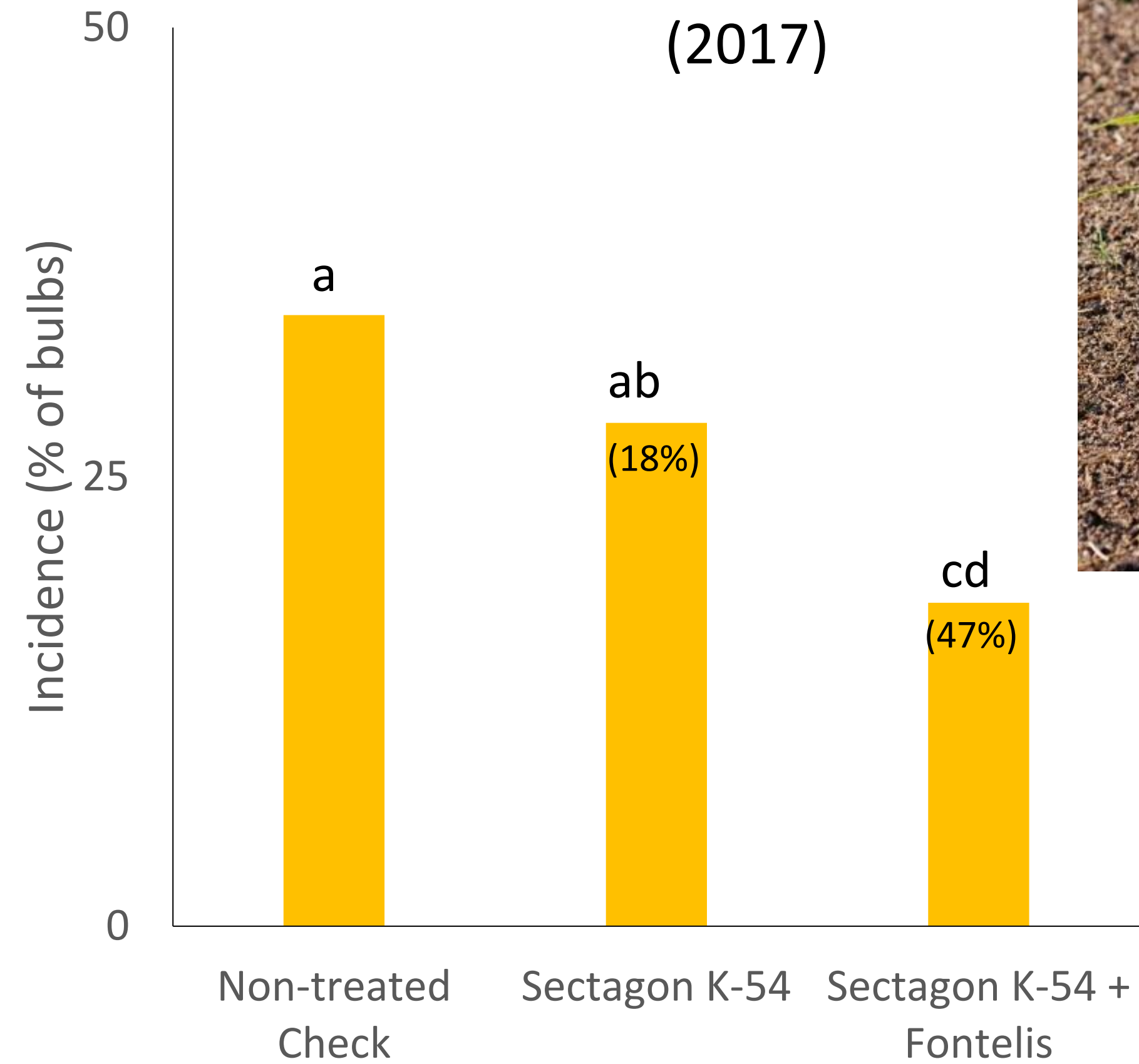
CAN FUMIGATION AND FONTELIS BE COMBINED?



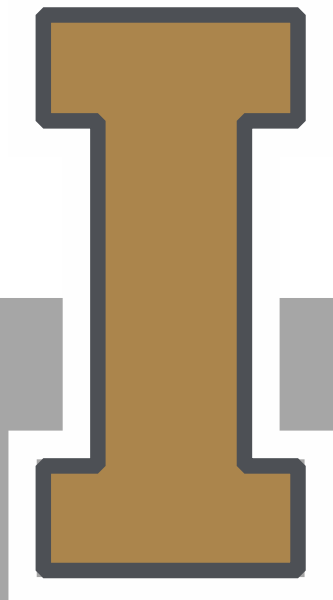
* Applied via drip at 2 leaf stage



CAN FUMIGATION AND FONTELIS BE COMBINED?



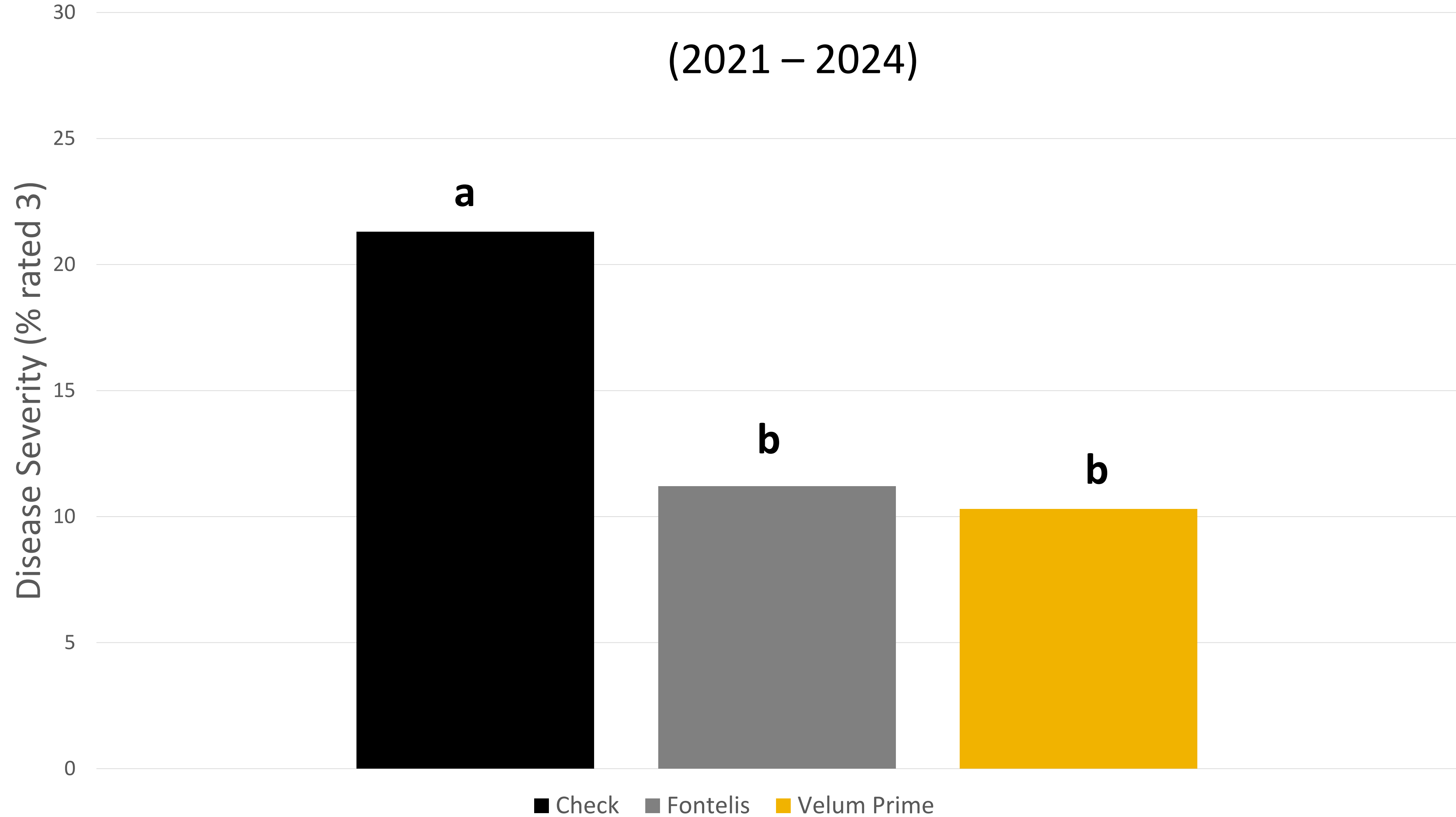
* Applied via drip at 2 leaf stage



WHAT ABOUT VELUM PRIME?



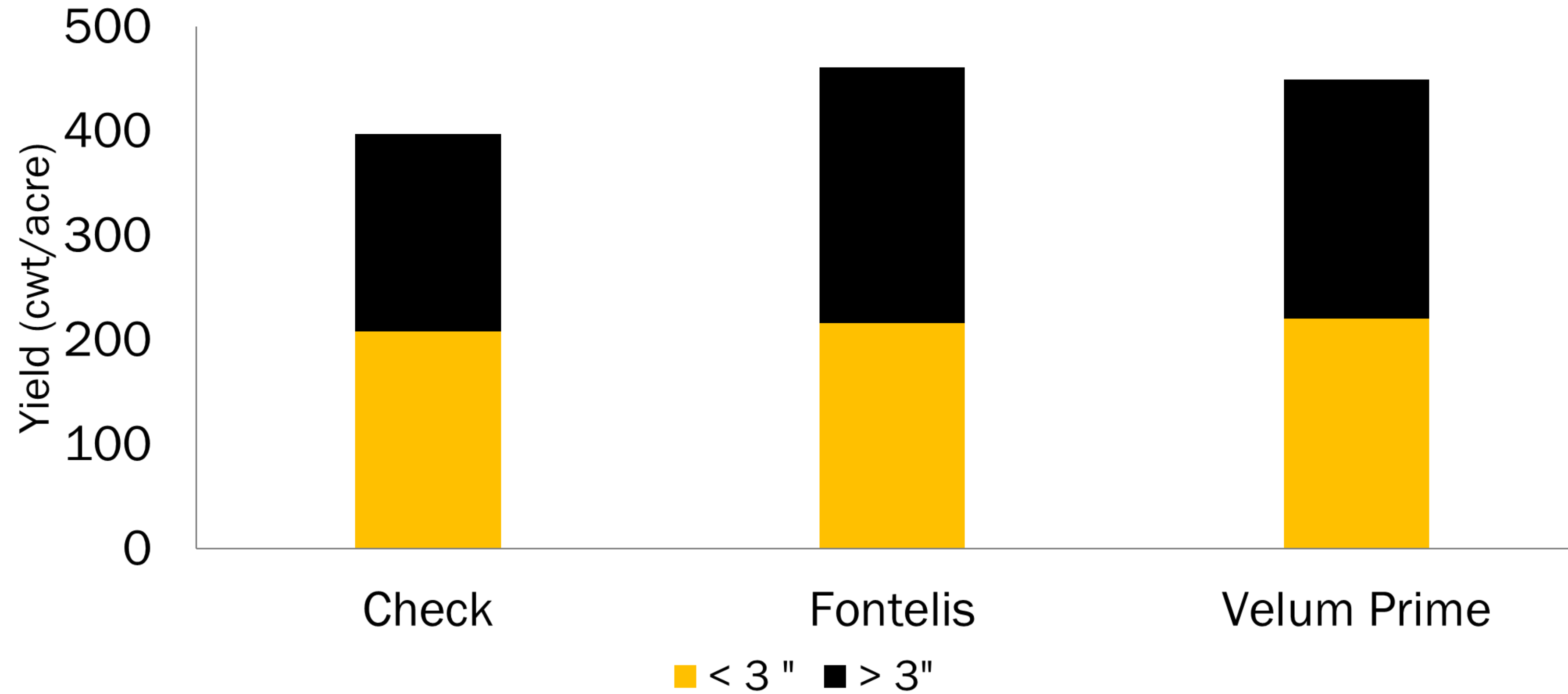
(2021 – 2024)



WHAT ABOUT VELUM PRIME?



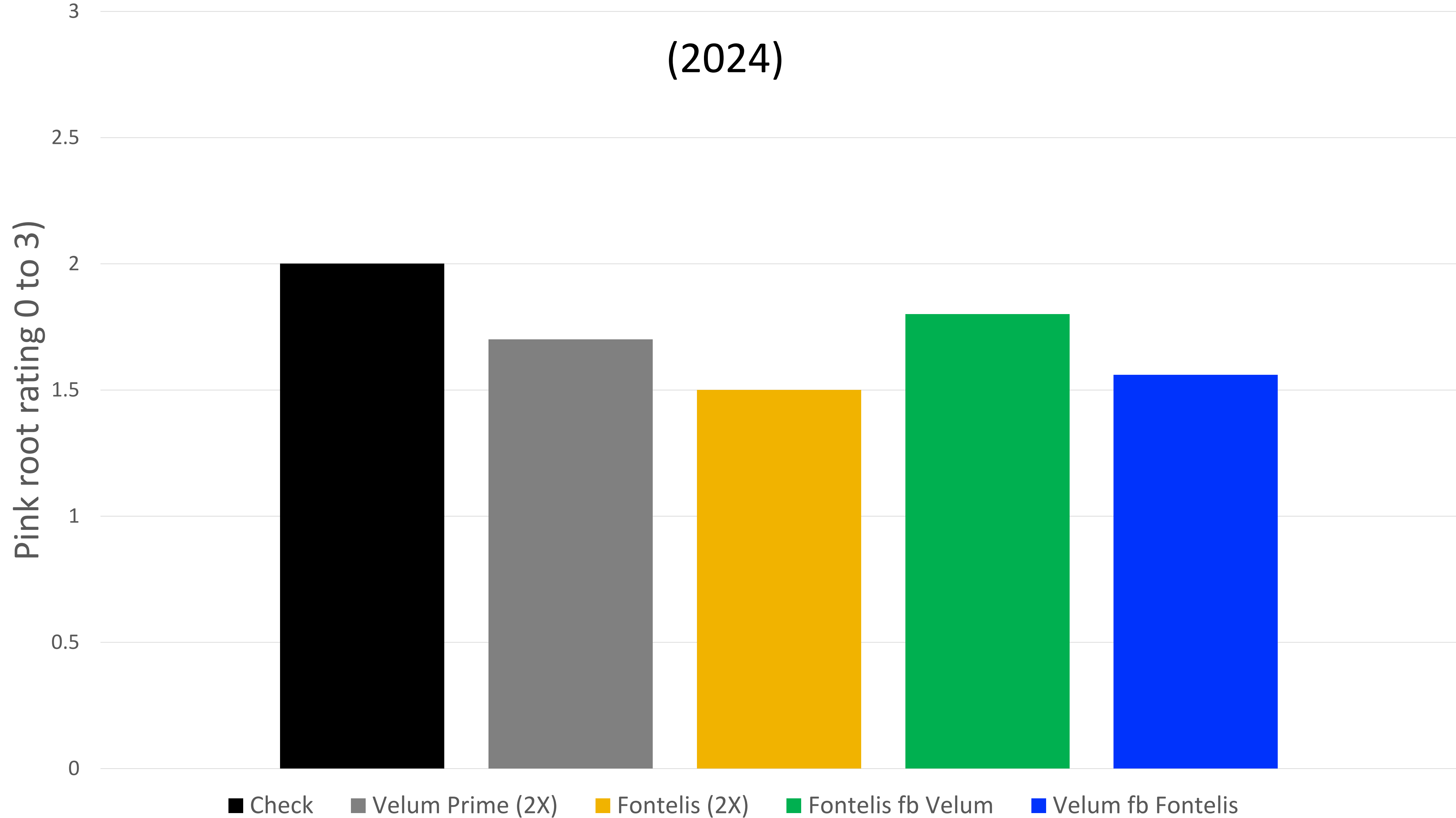
(2021 – 2023)



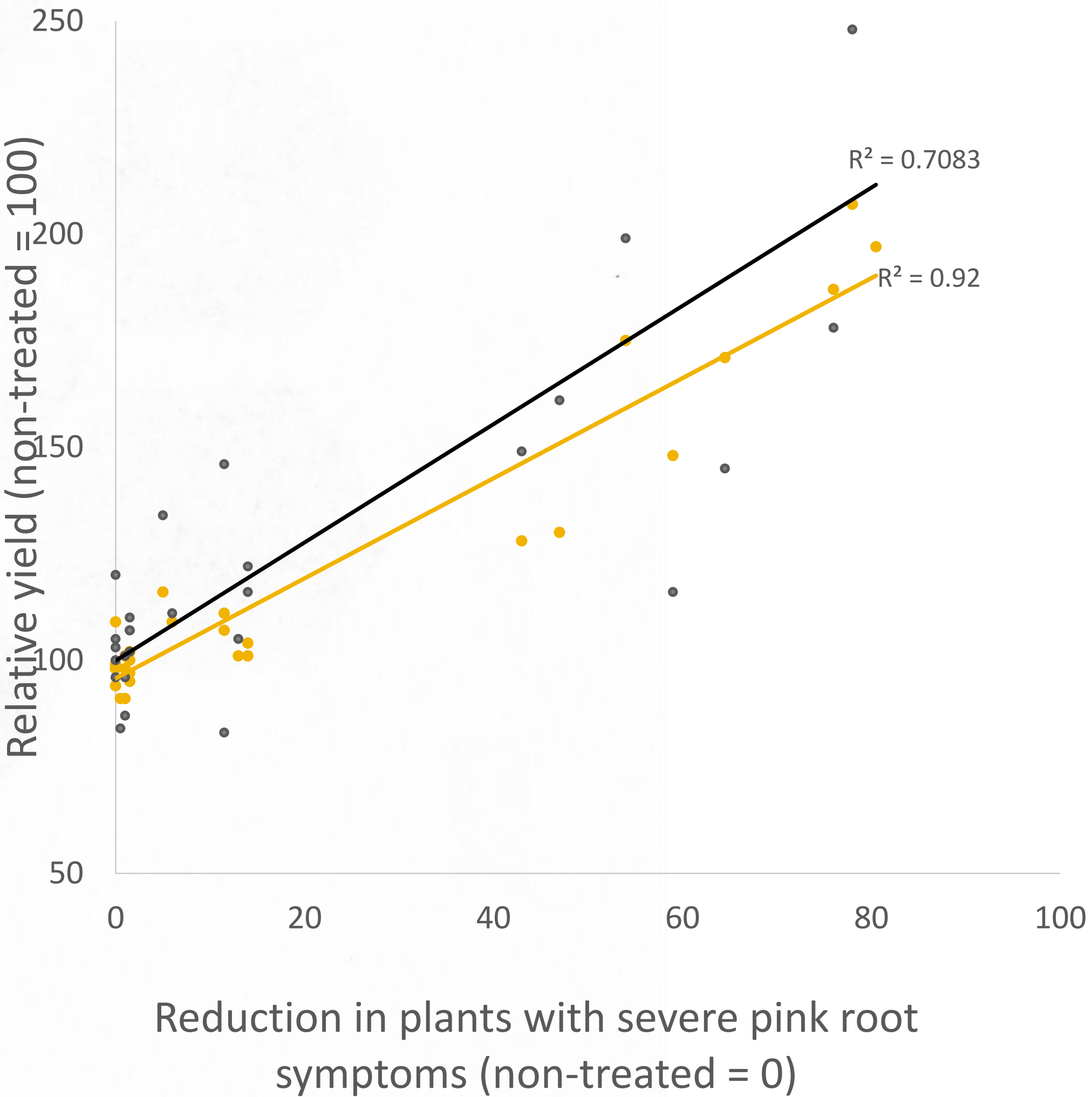
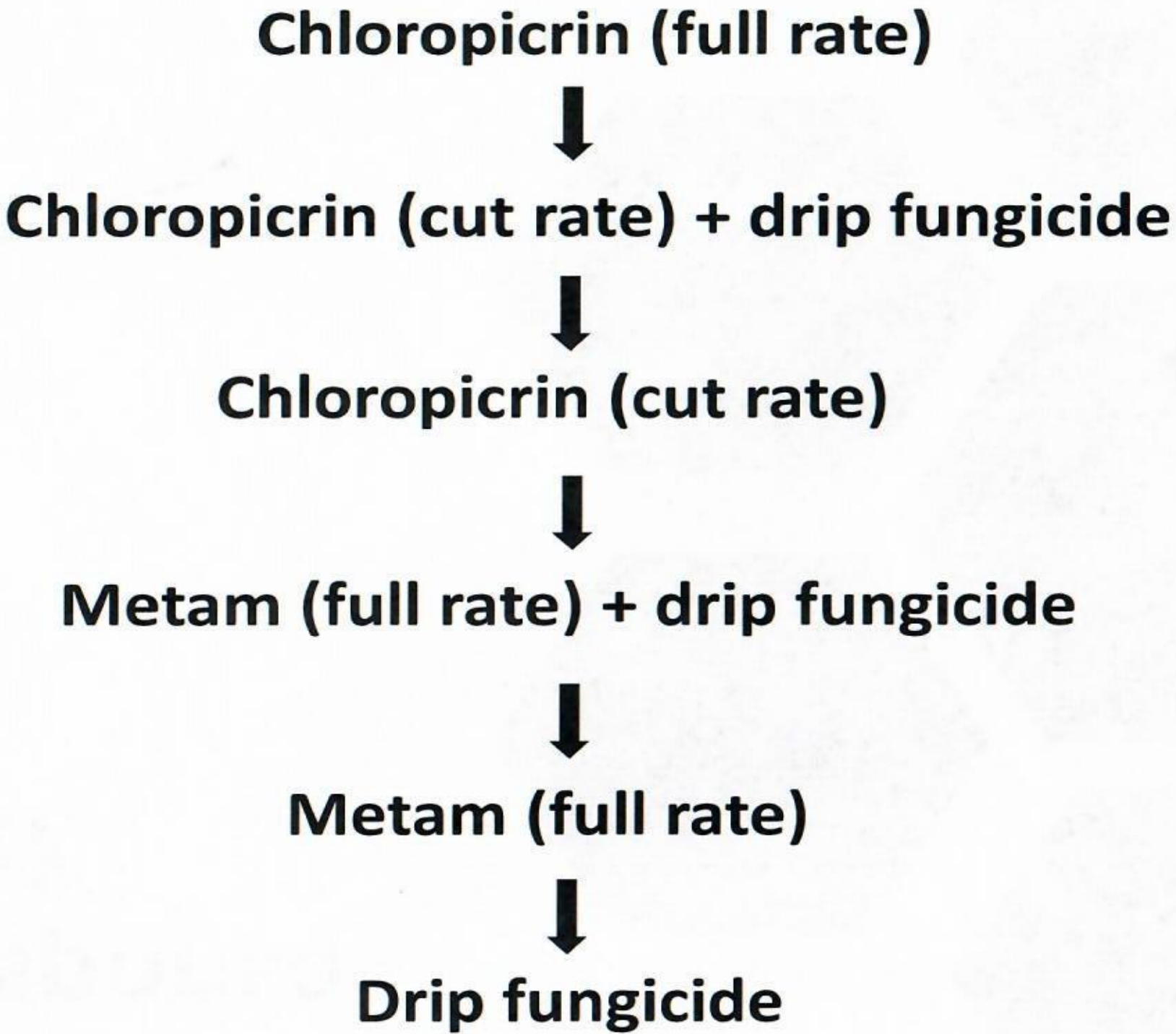
WHAT ABOUT ROTATING CHEMISTRY?



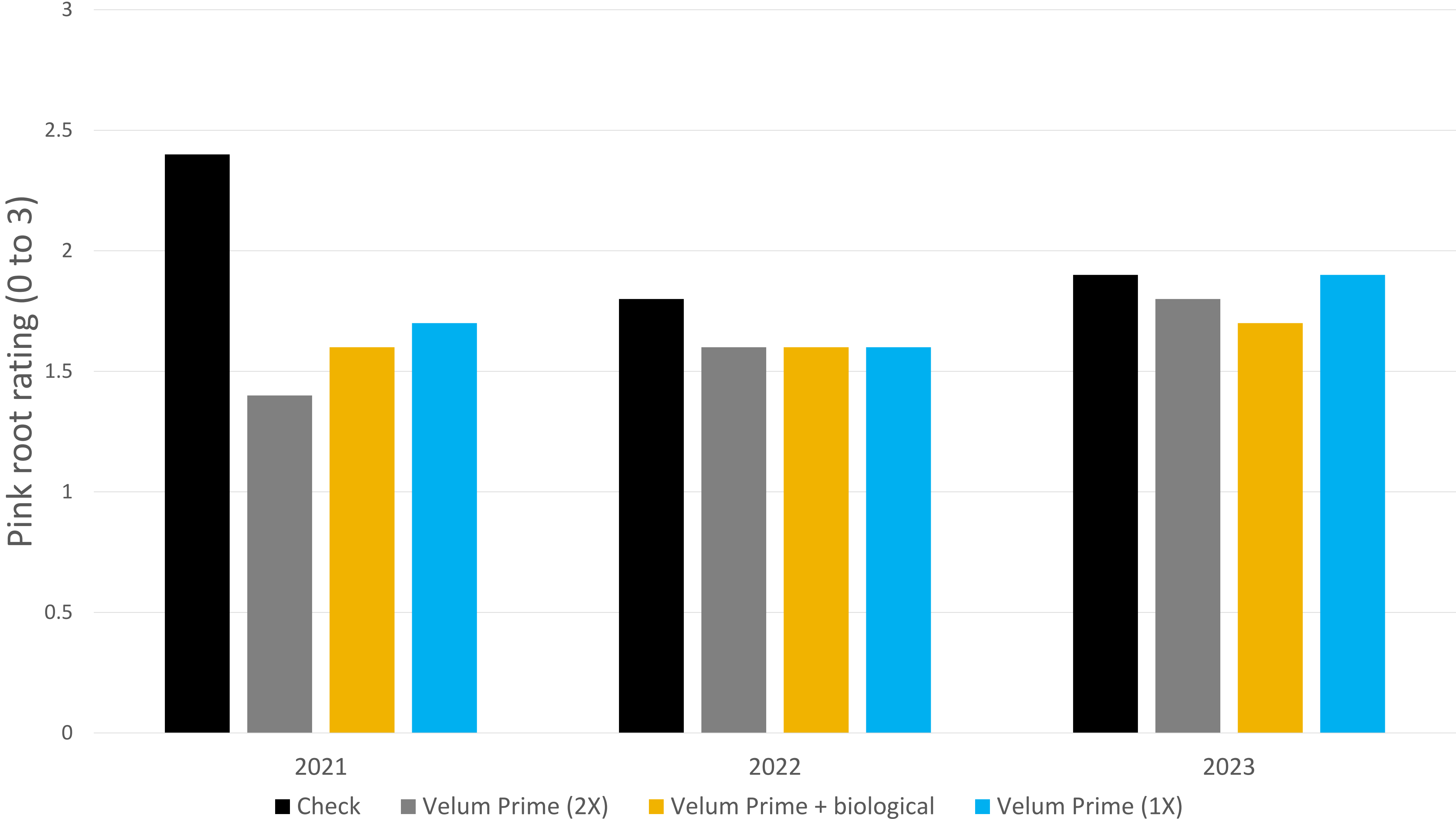
(2024)



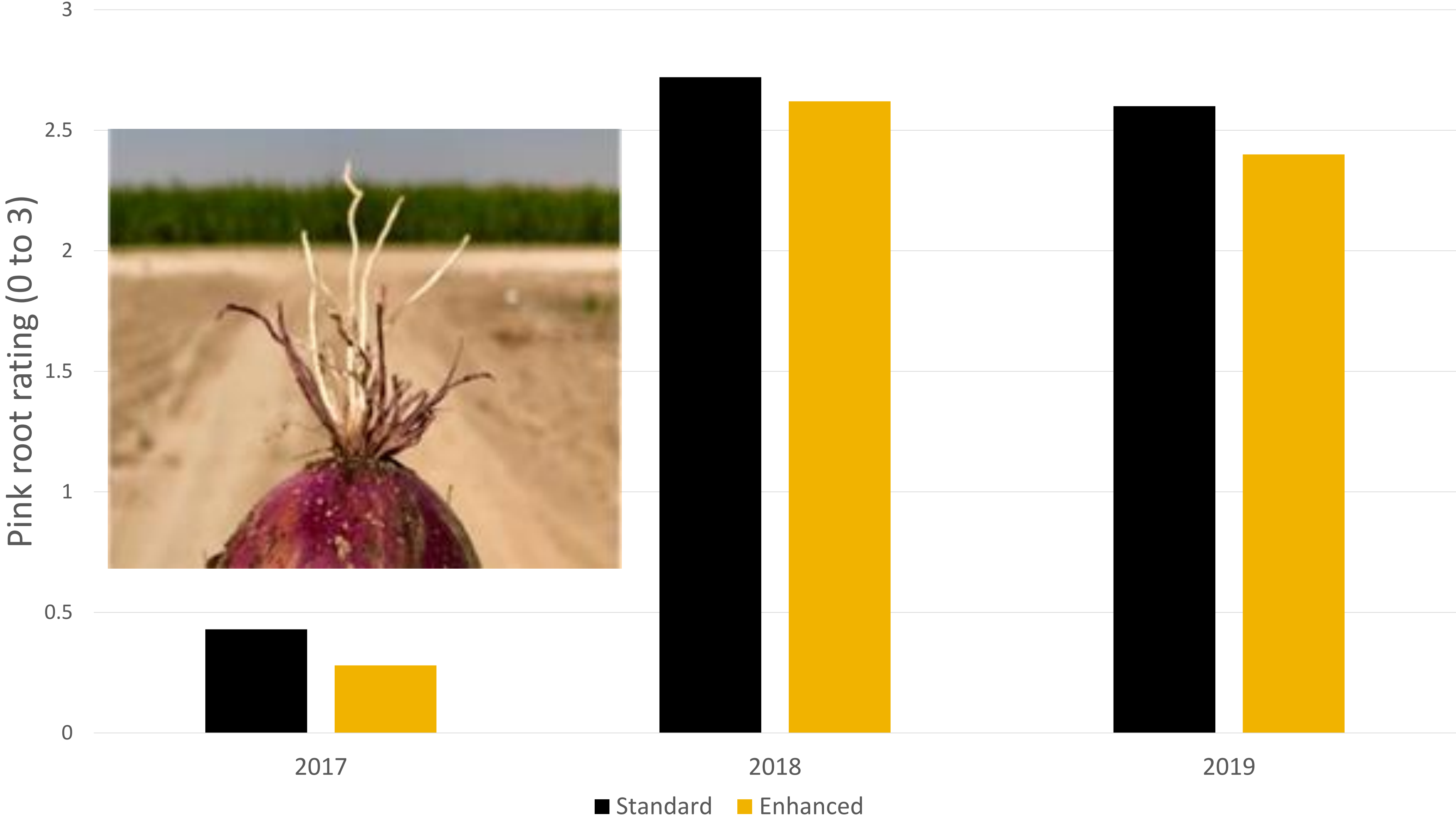
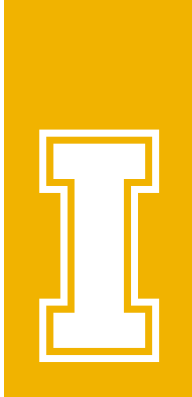
Relative effectiveness of pink root control options



DO BIOLOGICALS WORK?



DO NUTRIENT PROGRAMS WORK?

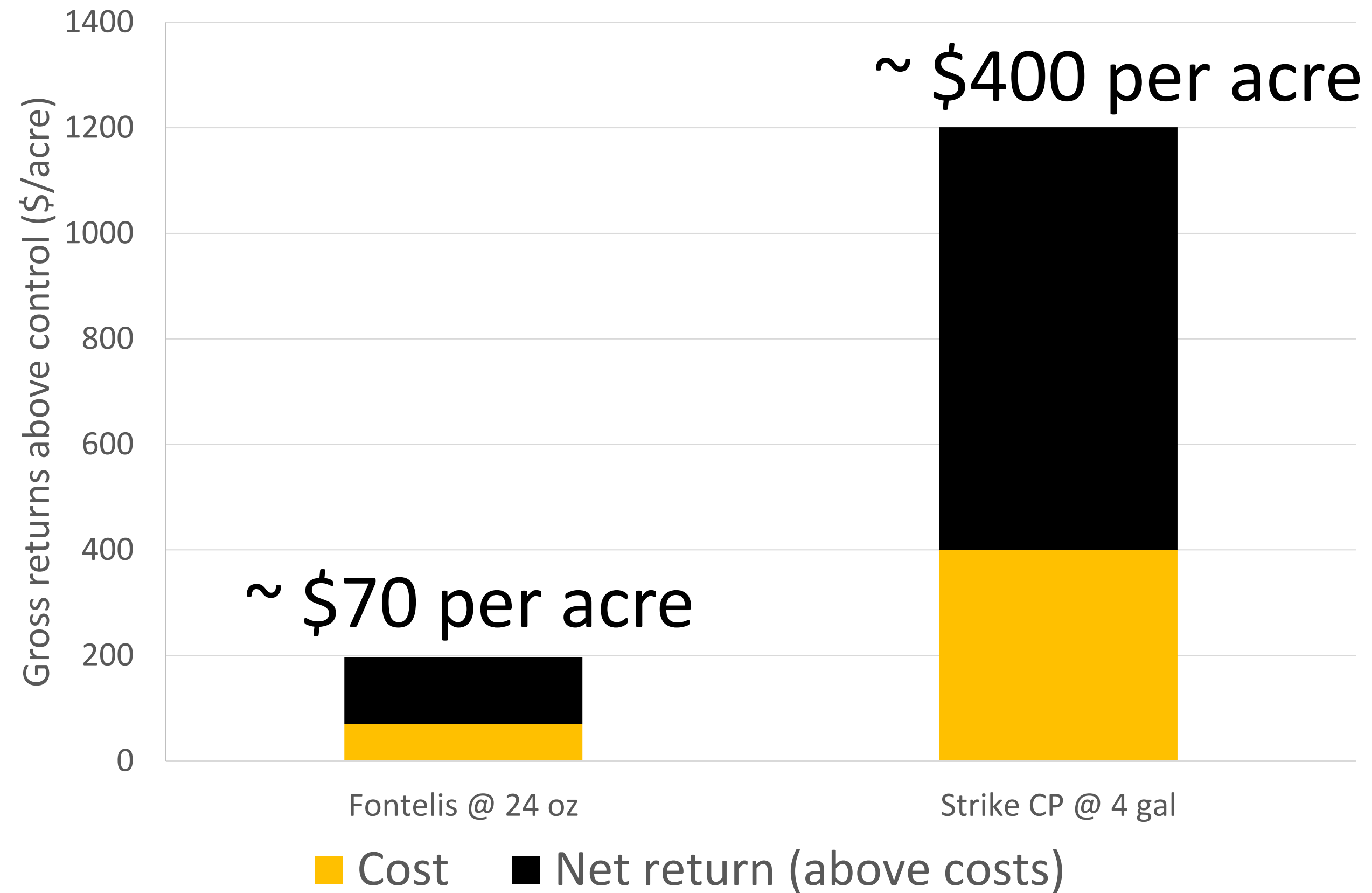


WHAT ABOUT OTHER ALTERNATIVES?



■ Check ■ Fontelis ■ Solarization ■ Solarization + Fontelis

ECONOMICS ARE IMPORTANT!

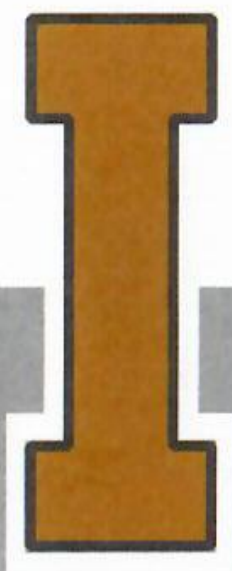
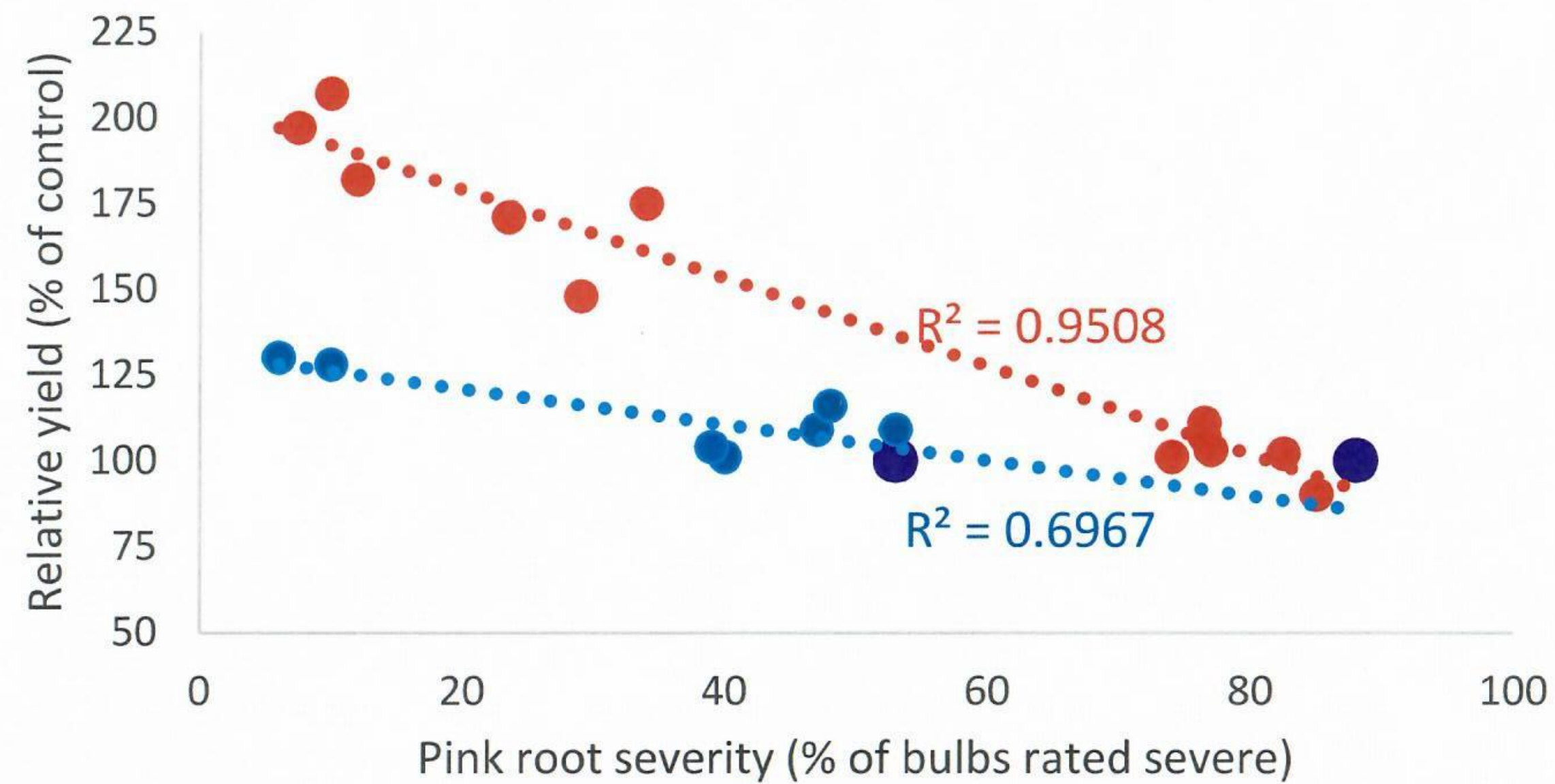


* Based on 4 years of trials, and lots of assumptions about costs and onion prices*

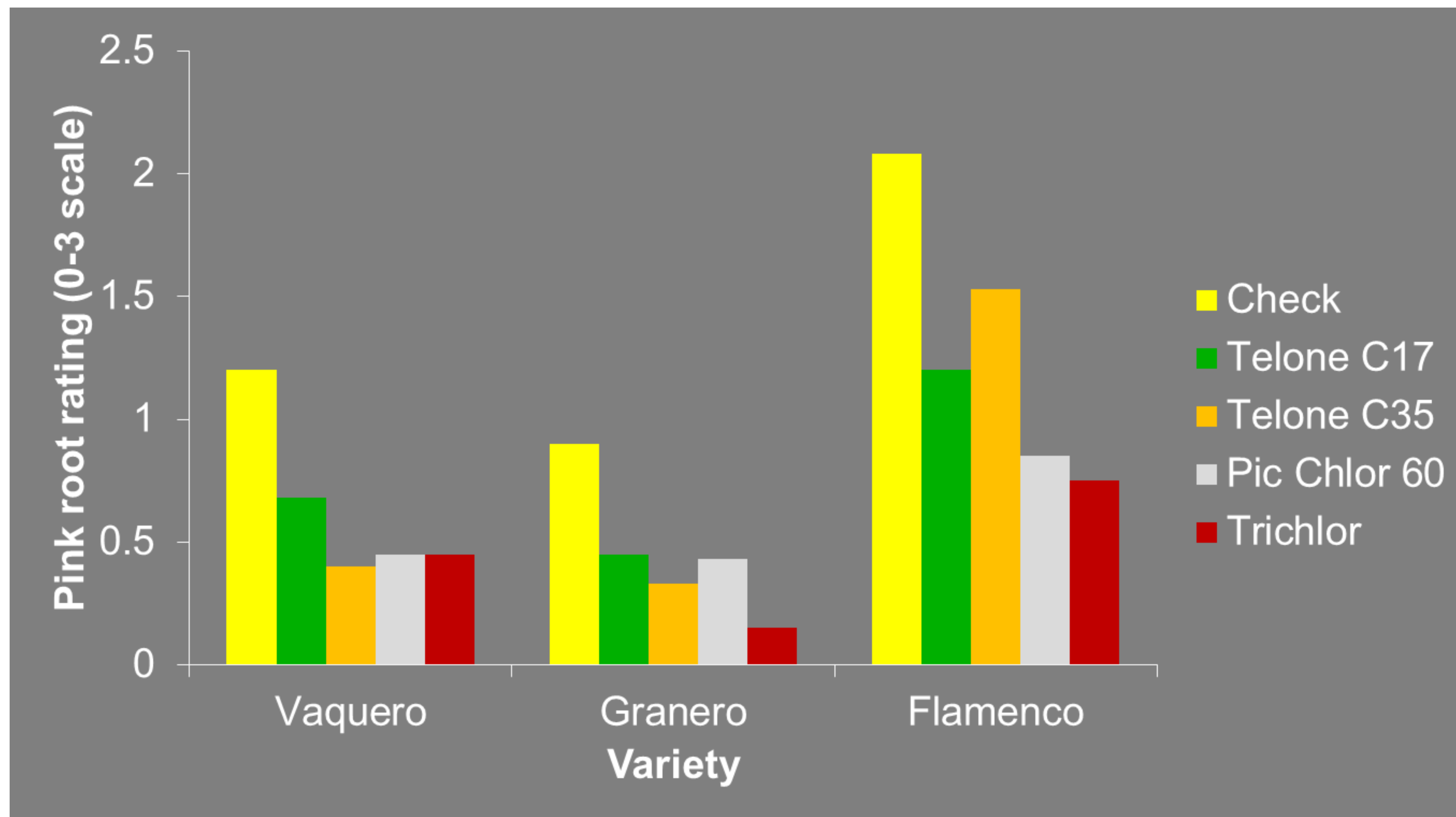
RELATIVE EFFECTIVENESS

4 gal CP > Fontelis + 3 gal CP > 3 gal CP > Fontelis + 50 gal Metam > 50 gal Metam > Fontelis

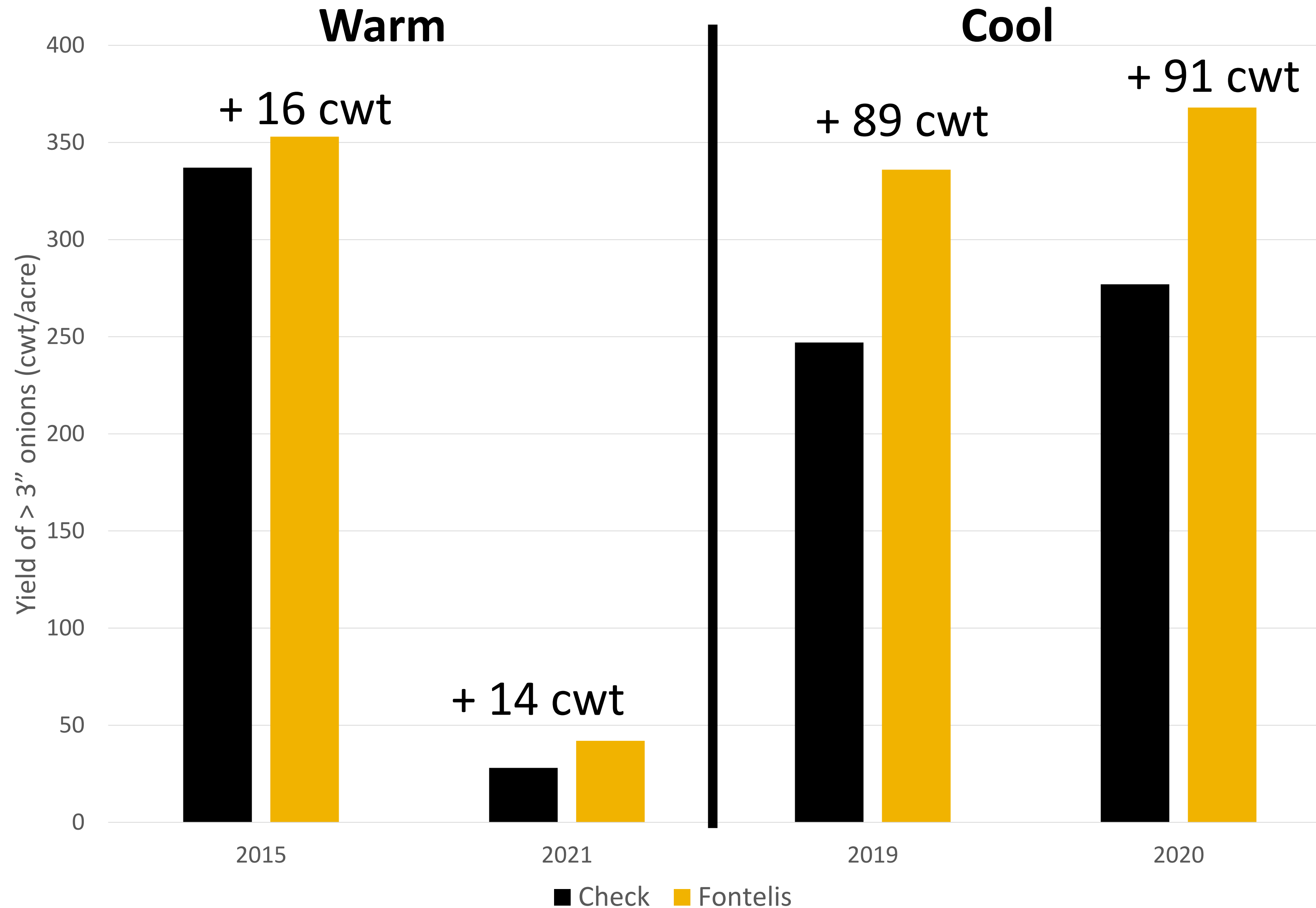
YOUR RESULTS MAY VARY!



WHAT ABOUT VARIETY RESPONSE?



WEATHER IMPACT



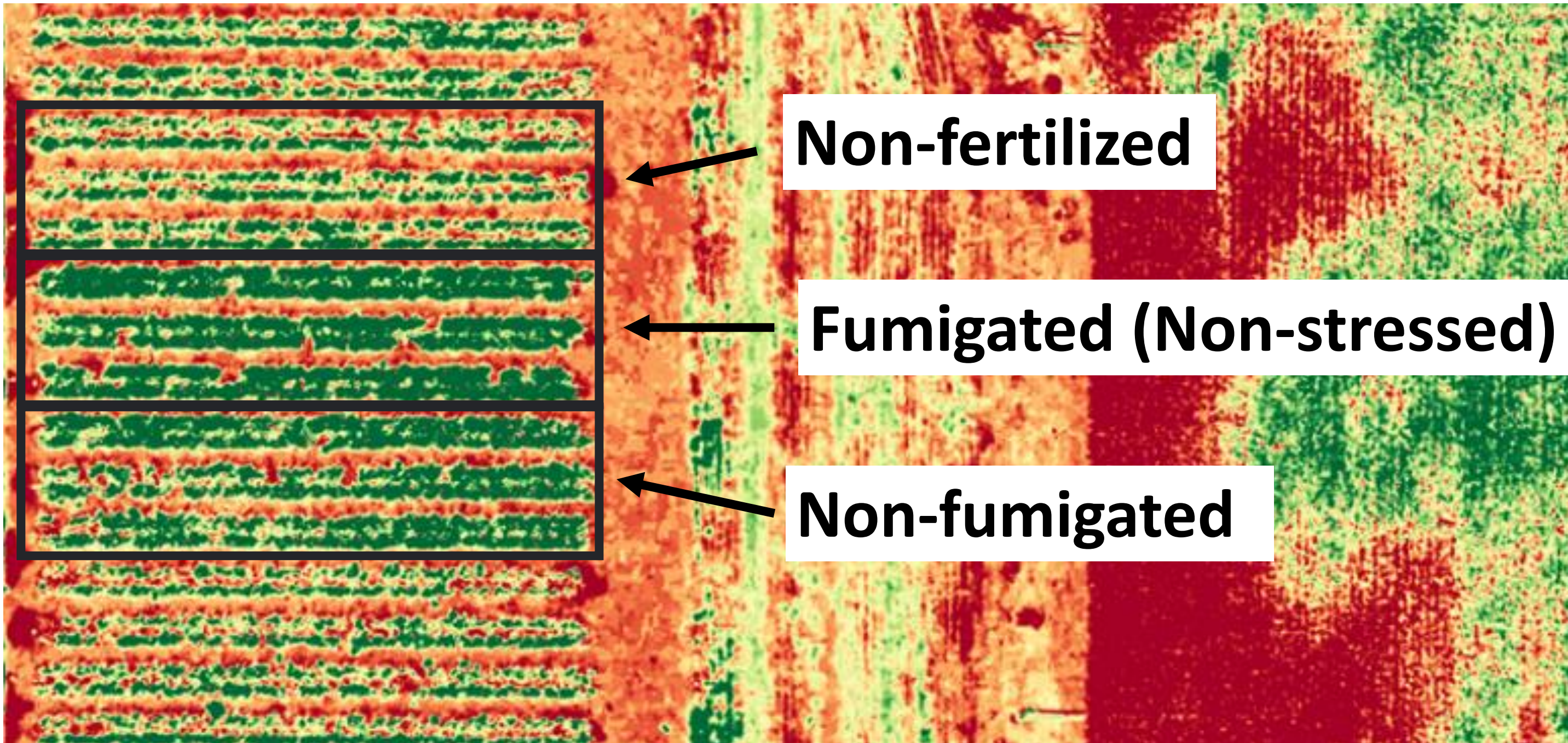
SHOULD WE RE-THINK HOW MUCH WE RELY ON FUMIGATION IN ONION PRODUCTION?

- + Breeding efforts are working
- + Drip irrigation reduces stress
- + Drip irrigation is lengthening rotations
- + Alternatives like Fontelis and Velum Prime are available





REMOTE SENSING

- Evaluate the use of UAV based sensor systems for ability to differentiate pink root infection from water or nitrogen stress under field conditions



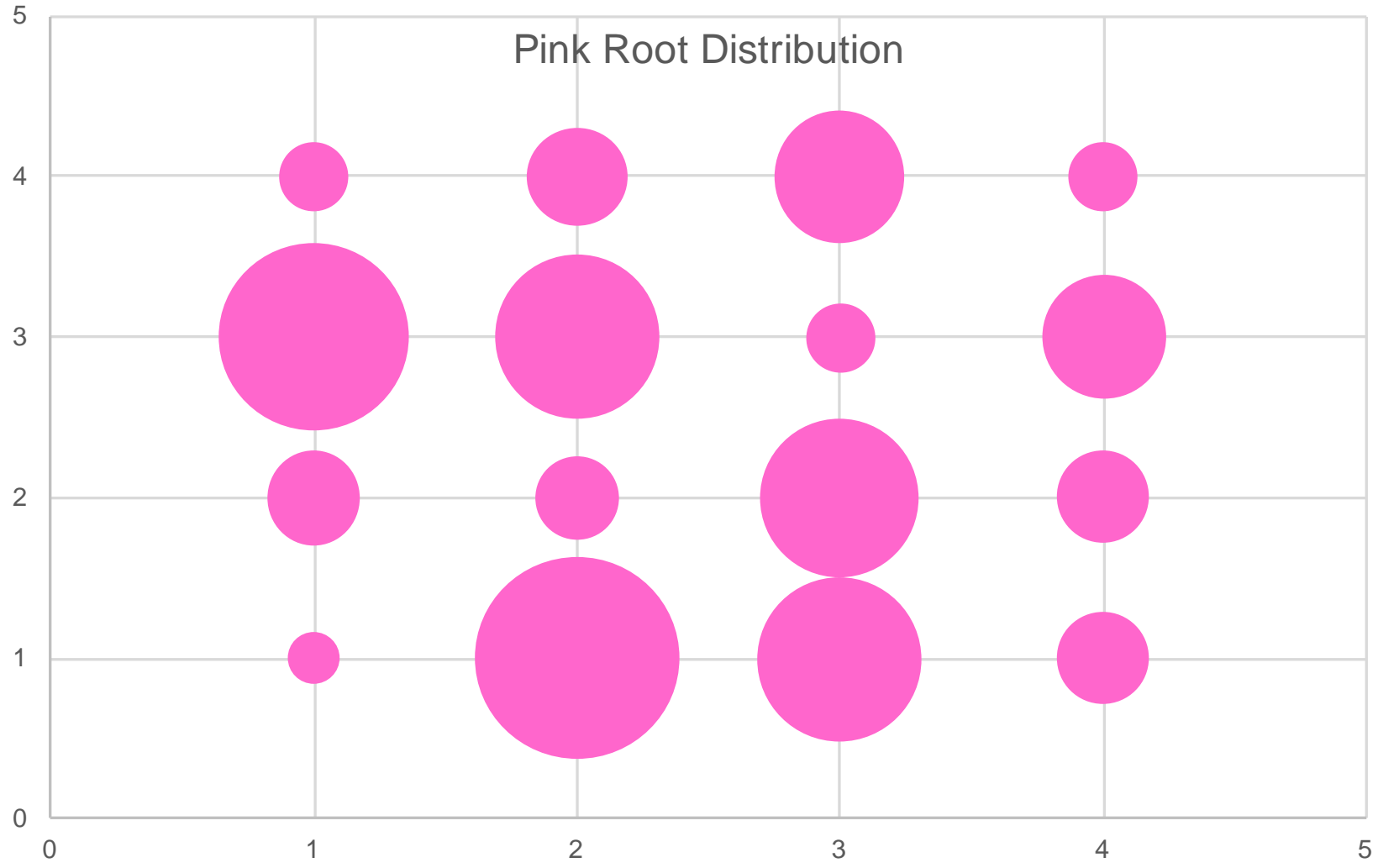
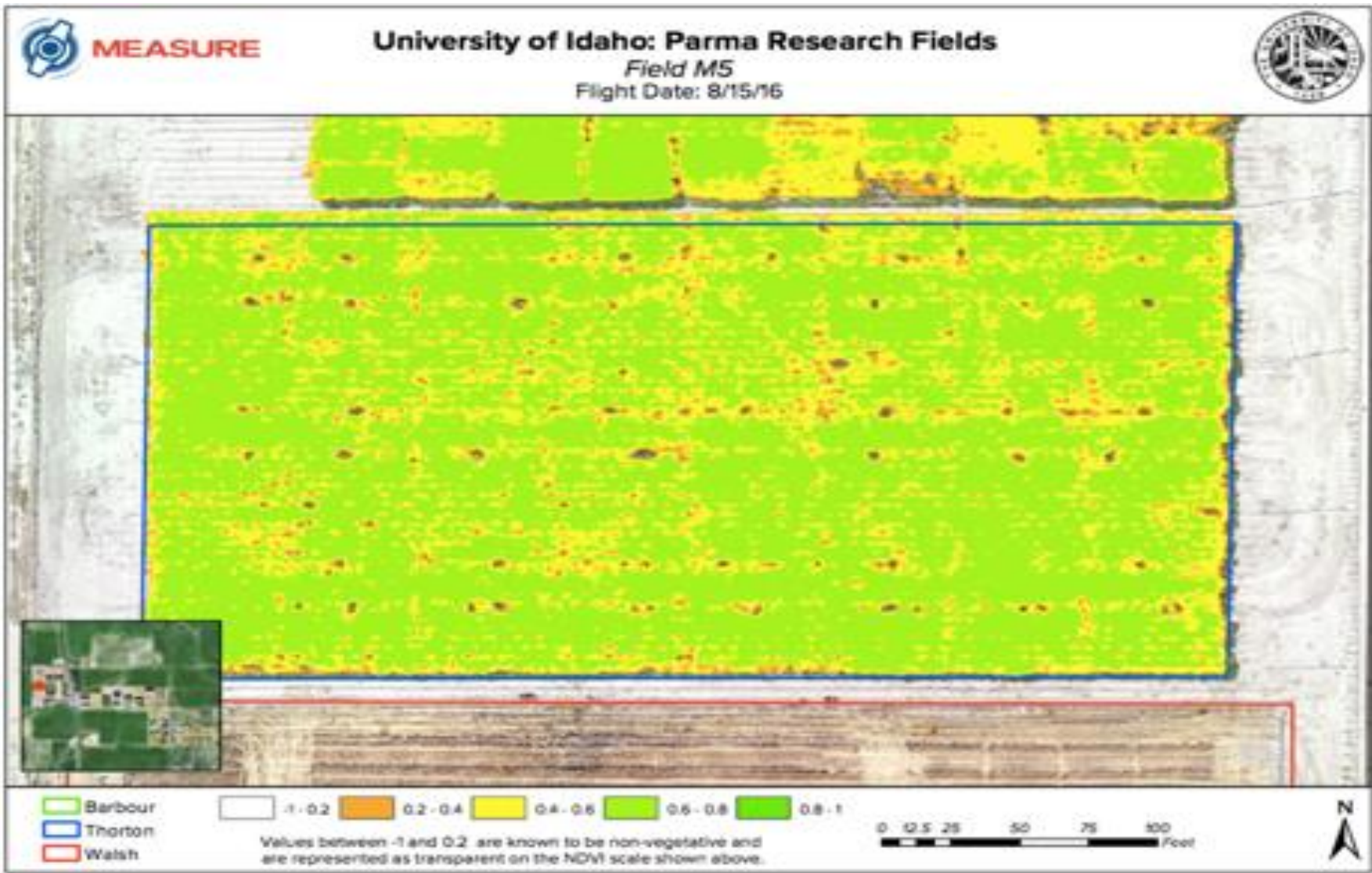


What information can we gather about plant health in this scenario?

Treatment	Non-fumigated	Fumigated	Non-fertilized	Reduced Water
Soil Fraction	0%	0%	0%	0%
Leaf Fraction	100%	100%	100%	100%
Pixel Diagram				
NDVI Value	0.69 <i>b</i>	0.72 <i>a</i>	0.68 <i>b</i>	0.69 <i>b</i>

- At leaf-level there were few significant differences in vegetative indices among treatments (only general, stresses vs. non-stressed)
- Principle component analysis (PCA) is unable to distinguish between cultivars of different color
- Results suggest that leaf-level variation is not explained by pink root infection severity

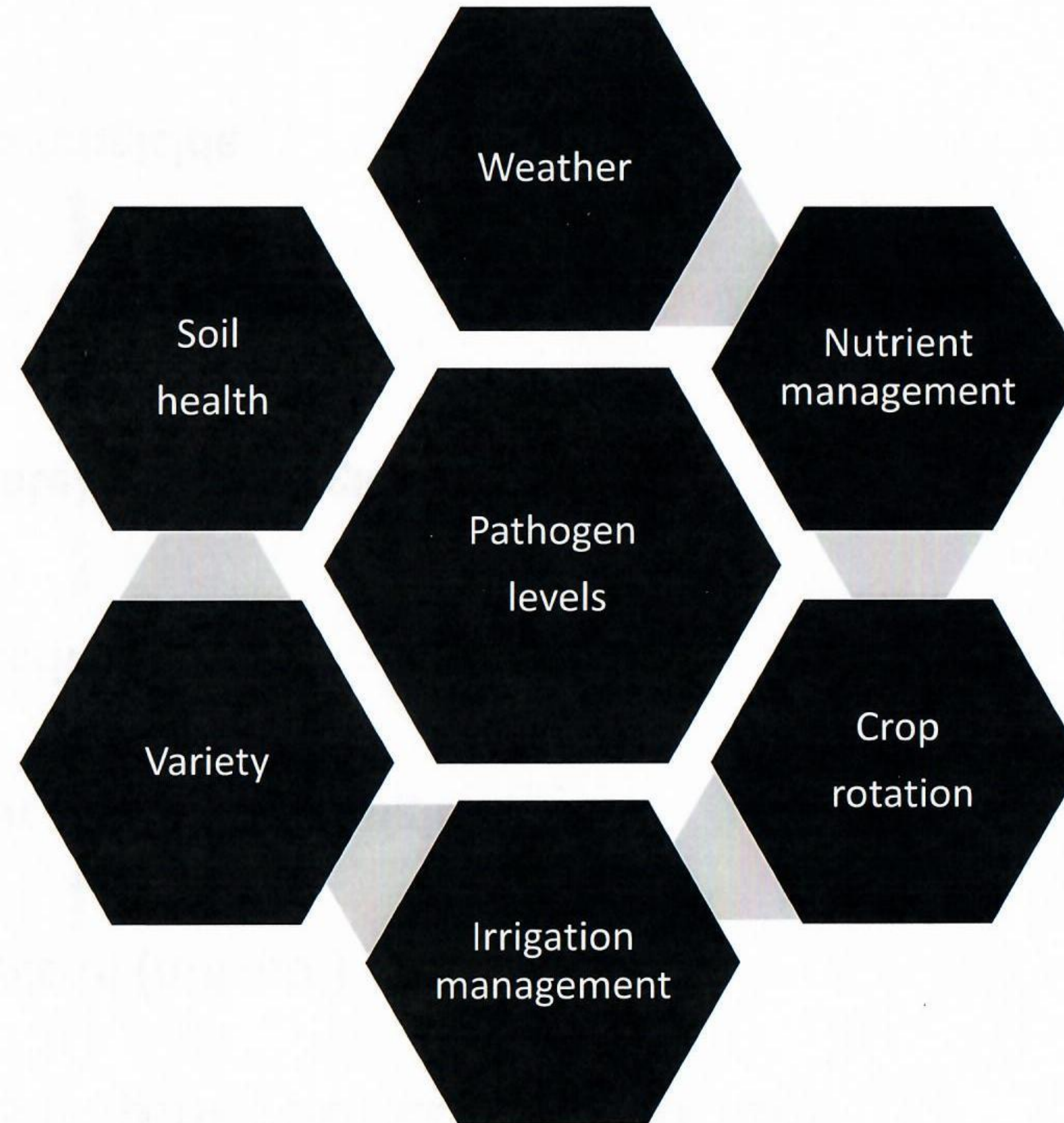
PATHOGEN POPULATIONS



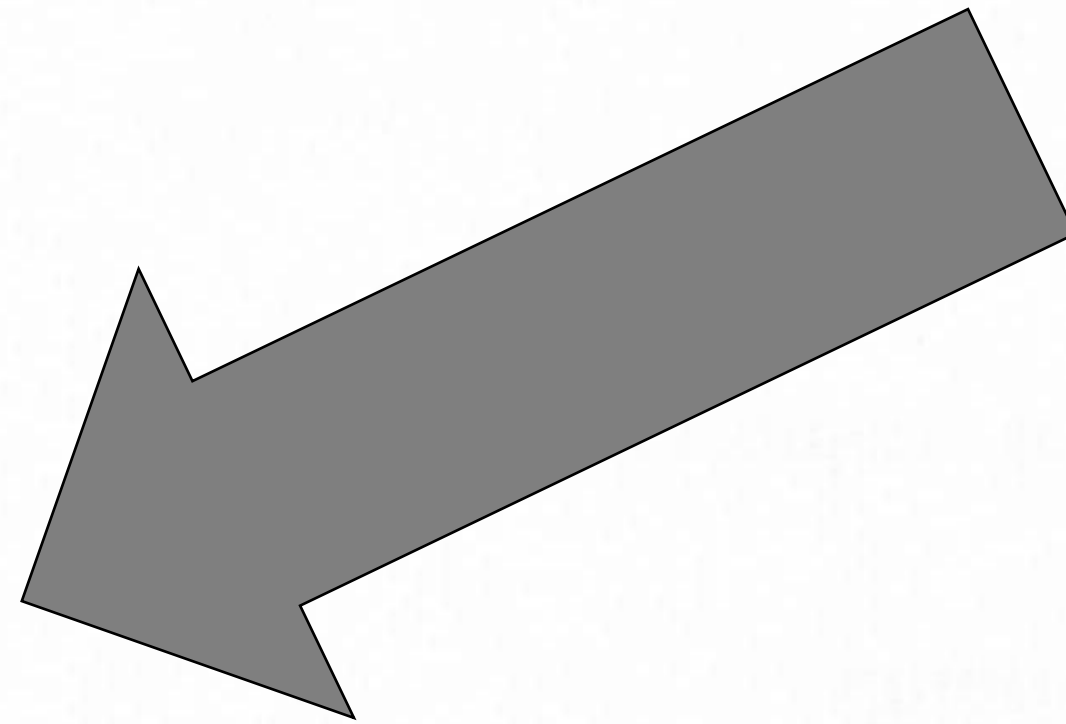
Range from 70 to 1000 pg DNA /g soil (moderate to high)

DO WE NEED TO START THINKING DIFFERENTLY?

What determines
how big a response
you get?



Management
Options



ACKNOWLEDGEMENTS

- Funding provided by IEOOC and many industry partners over the years
- James Woodhall's Program
- Onion Agronomy Program

