



INTEGRATING VEGETABLE & POULTRY PRODUCTION

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Iowa State University

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Grade A Gardens

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Star Grass Farm

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WHY INTEGRATE POULTRY & VEGETABLE CROPS?

- Organic vegetable production
- Decrease off-farm inputs
- Soil health
- Pest/weed management
- Diversify farm income

RESEARCH



Vegetable and cover crop performance



Bird performance / Meat quality



Soil properties



Pest management



Microbiological contamination



Economic analysis

Iowa State University

Dr. Ajay Nair

Dr. Elizabeth Bobeck

Dr. Dong Ahn

Dr. Kathleen Delate

Dr. Marshall McDaniel

Dr. Angela Shaw

Dr. James Dickson

Dr. Alejandro Plastina

Arlene Enderton

Brandon Carpenter

Kayla Elmore

Perla Carmenante

Khadija Mbacke

University of Kentucky

Dr. David Gonthier

Viktor Halmos

Karina Garcia

University of California, Davis

Dr. Maurice Pitesky

Dr. Jeffrey Mitchell

Faye Duan

USDA- NIFA- Organic Agriculture
Research and Extension Initiative



United States Department of Agriculture
National Institute of Food and Agriculture

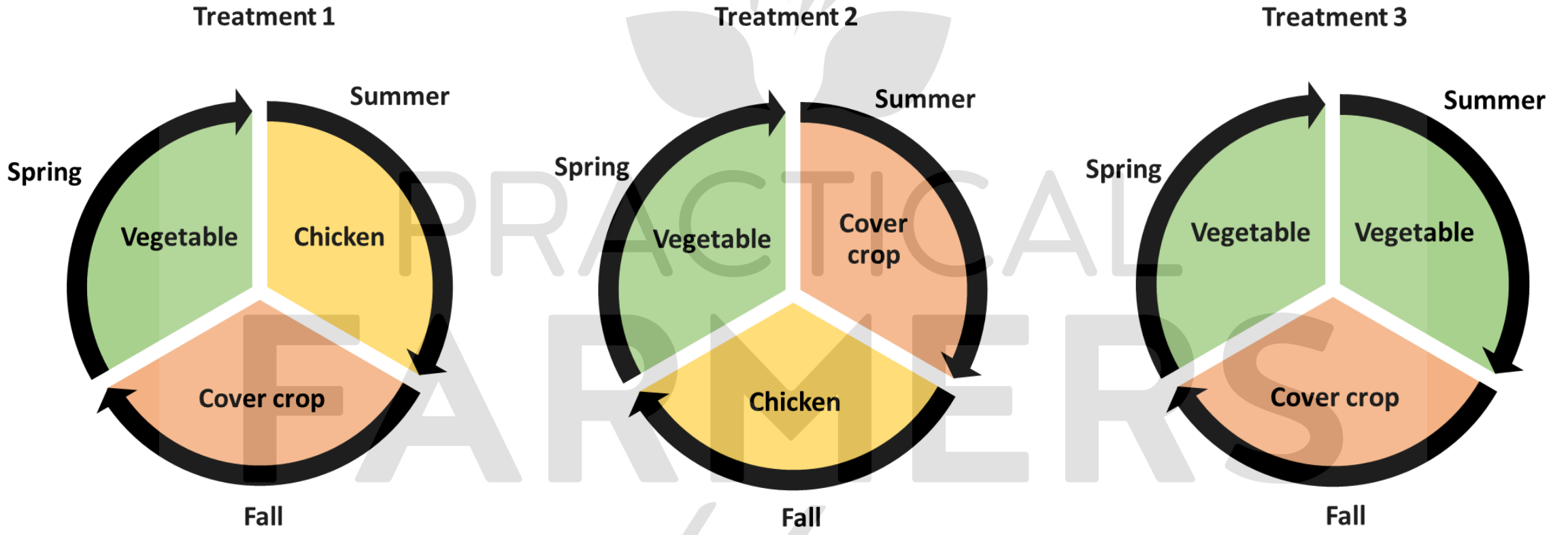


IOWA STATE
UNIVERSITY

PROJECT DESIGN

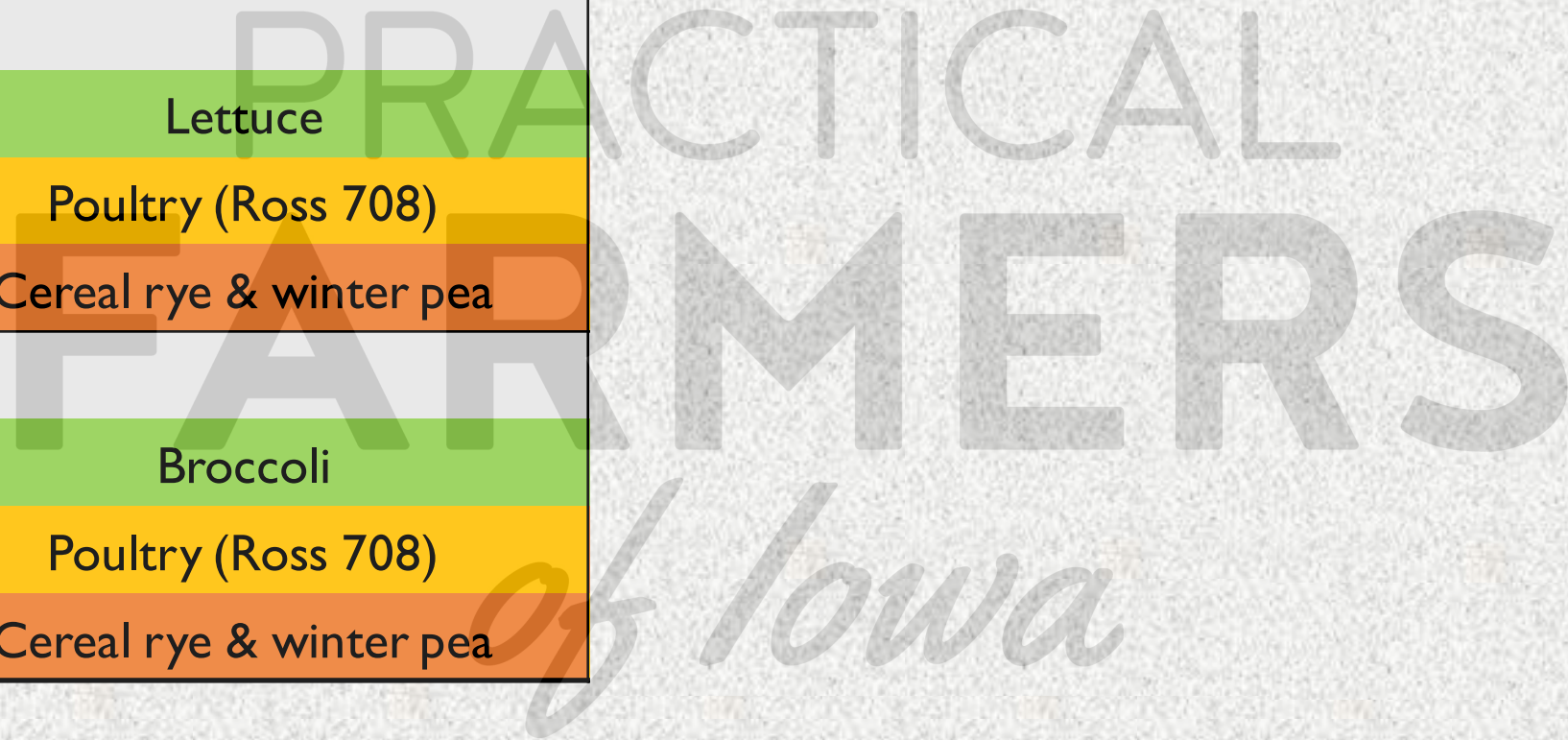
- Iowa State University
 - 3 treatments
 - 4 replications each
- 25 ft x 30 ft plots
- Indoor and outdoor birds





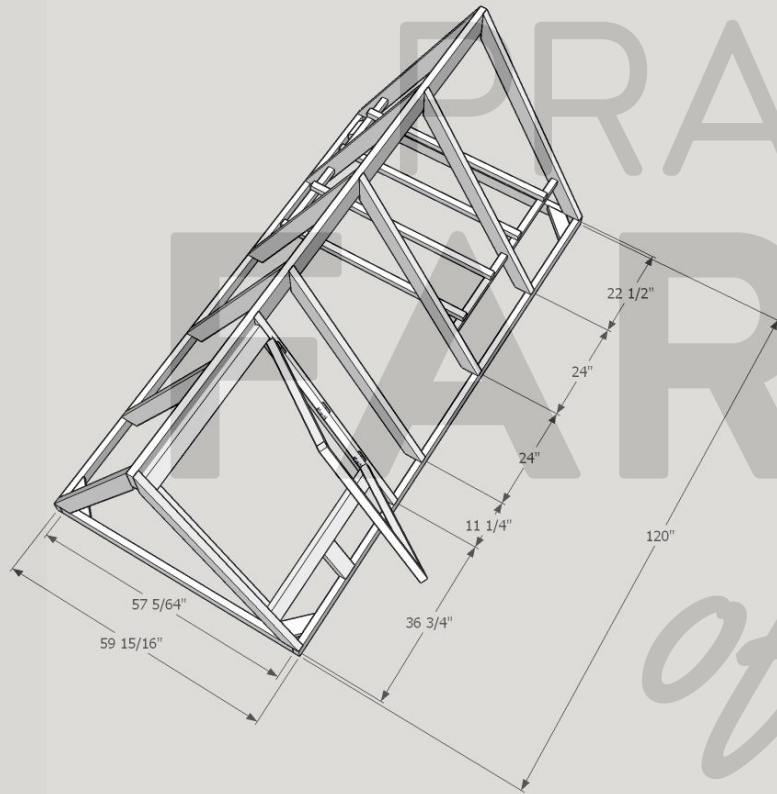
of Iowa

	Rotation 1	Rotation 2	Rotation 3
2021			
Spring	Spinach		
Summer	Poultry (Freedom Ranger)		
Fall	Cereal rye & winter pea		
2022			
Spring	Lettuce		
Summer	Poultry (Ross 708)		
Fall	Cereal rye & winter pea		
2023			
Spring	Broccoli		
Summer	Poultry (Ross 708)		
Fall	Cereal rye & winter pea		



CHICKEN TRACTOR

- 10 ft x 5 ft
- 25 birds each
- Wheel flips



Design by Brandon Carpenter







ROTATION I: CHICKENS AFTER SPRING VEGETABLE





of Iowa

First graze



Second graze



102
v-Ch-CC



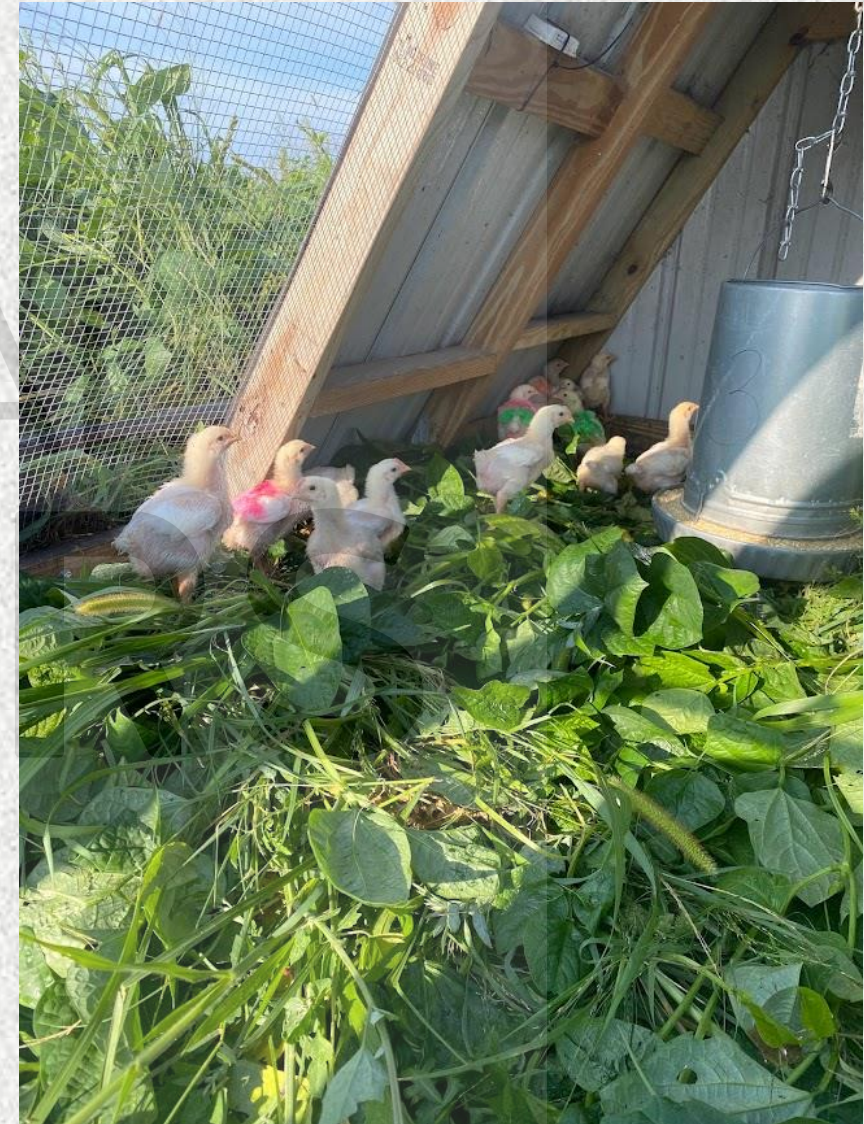
Teff: 8 lb/acre
Cowpea: 75-100 lb/acre



202
V-CC-Ch

About 60 days

ROTATION 2: CHICKENS AFTER COVER CROP





First graze



Second graze



June 20, 2022



RI:V-P-CC



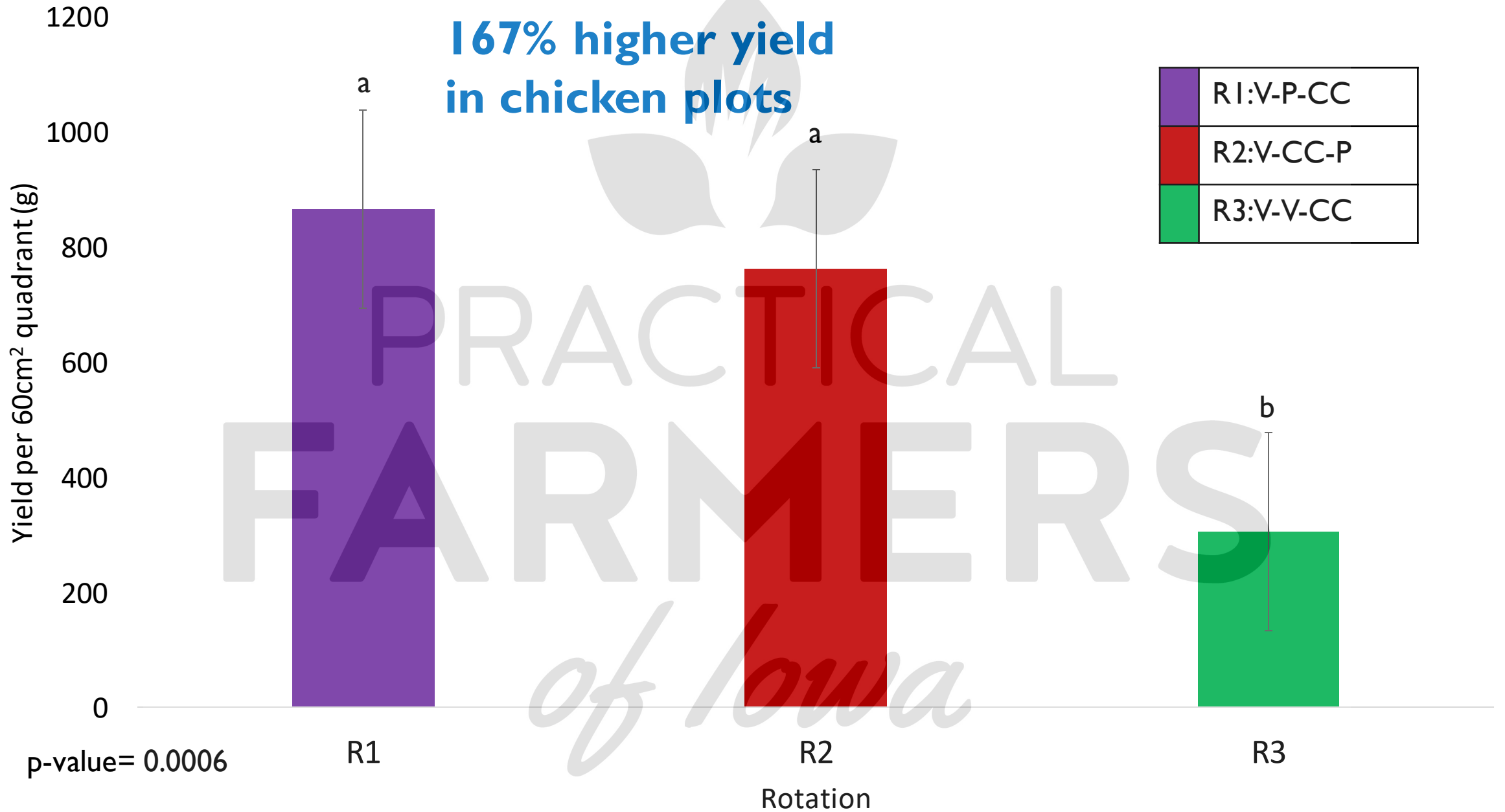
R2:V-CC-P



R3:V-V-CC

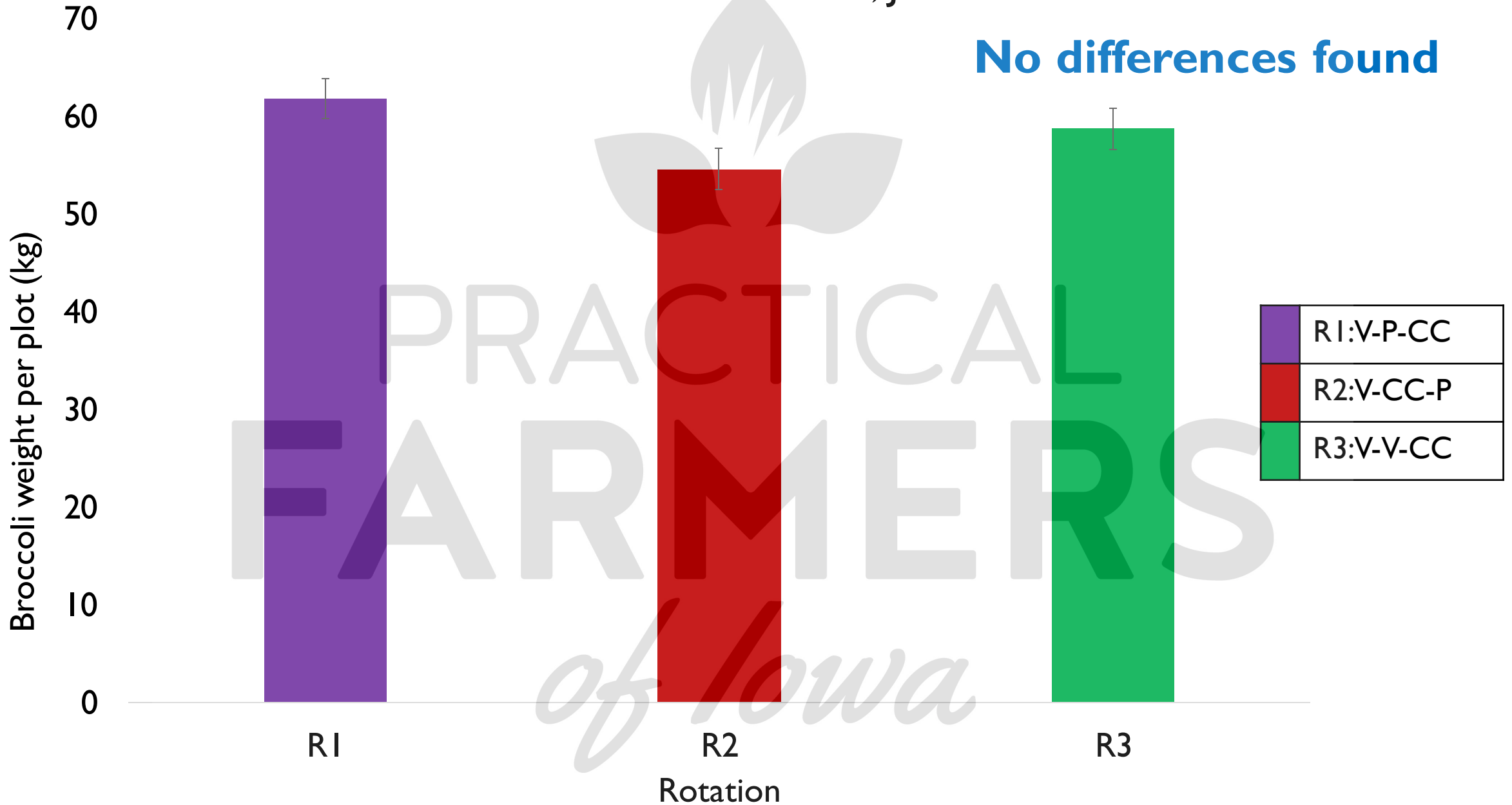
Leaf Lettuce Marketable Yield, June 2022

**167% higher yield
in chicken plots**



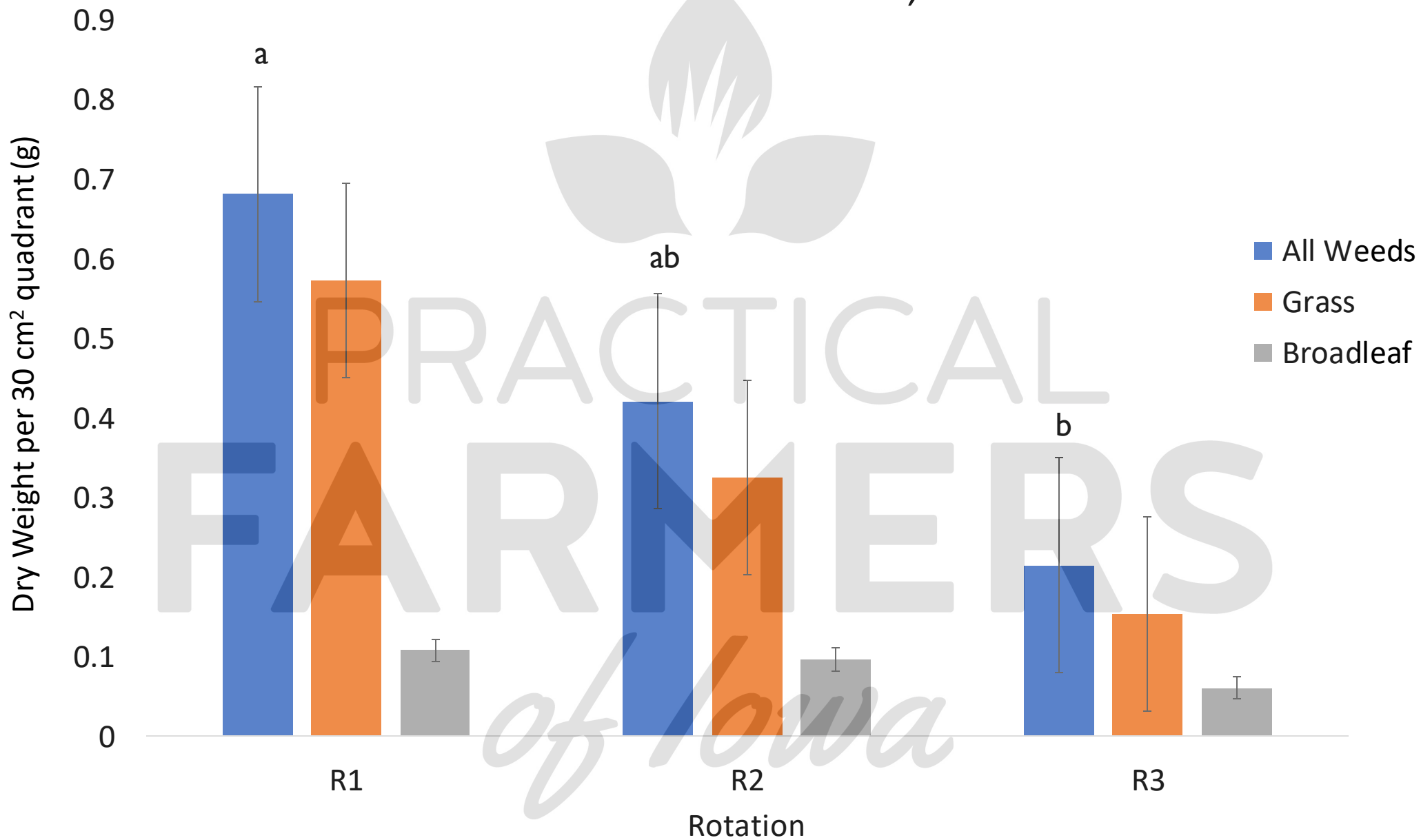


Broccoli Marketable Yield, June 2023





Weed Biomass in Broccoli, 2023



POULTRY PERFORMANCE

Dr. Elizabeth Bobeck & Kayla Elmore, ISU

- Feed Conversion Ratio (FCR)
- Behavior

Feed Conversion Ratio (FCR)

Feed Consumed

= FCR

Animal Weight



Group 1

Freedom Ranger

Ross 708

Outdoor (after vegetable)

2.87

1.88

Indoor

2.46

1.75

Group 2

Freedom Ranger

Ross 708

Outdoor (after cover crop)

2.47

1.92

Indoor

2.49

1.60

FOOD SAFETY FINDINGS

Dr. Angela Shaw (Texas Tech) & Dr. Jim Dickson (ISU)

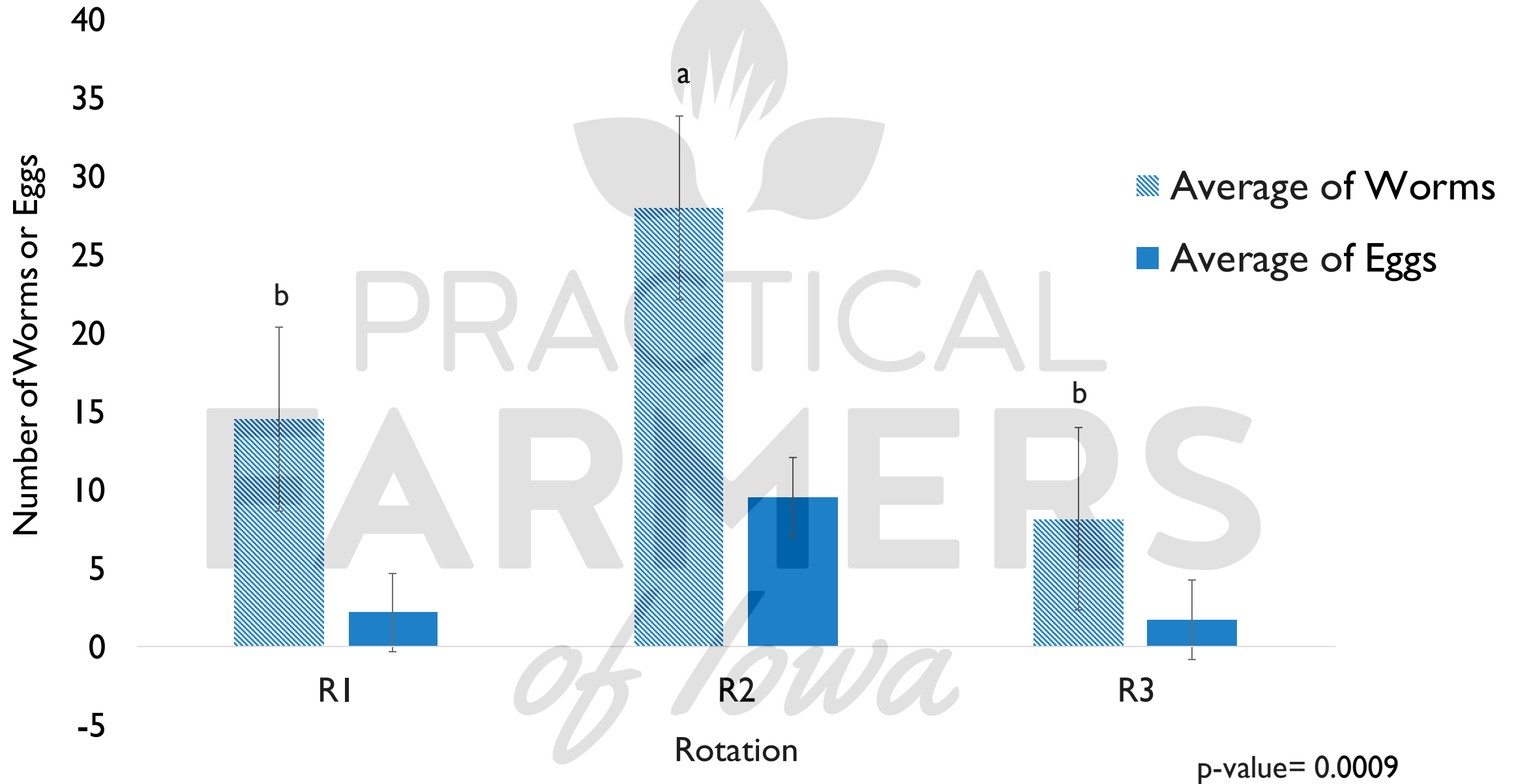
- Boot swabs
- Tissue sampling of vegetables
- No positive *Salmonella* samples in soil or vegetables
- All poultry summer 2023 positive





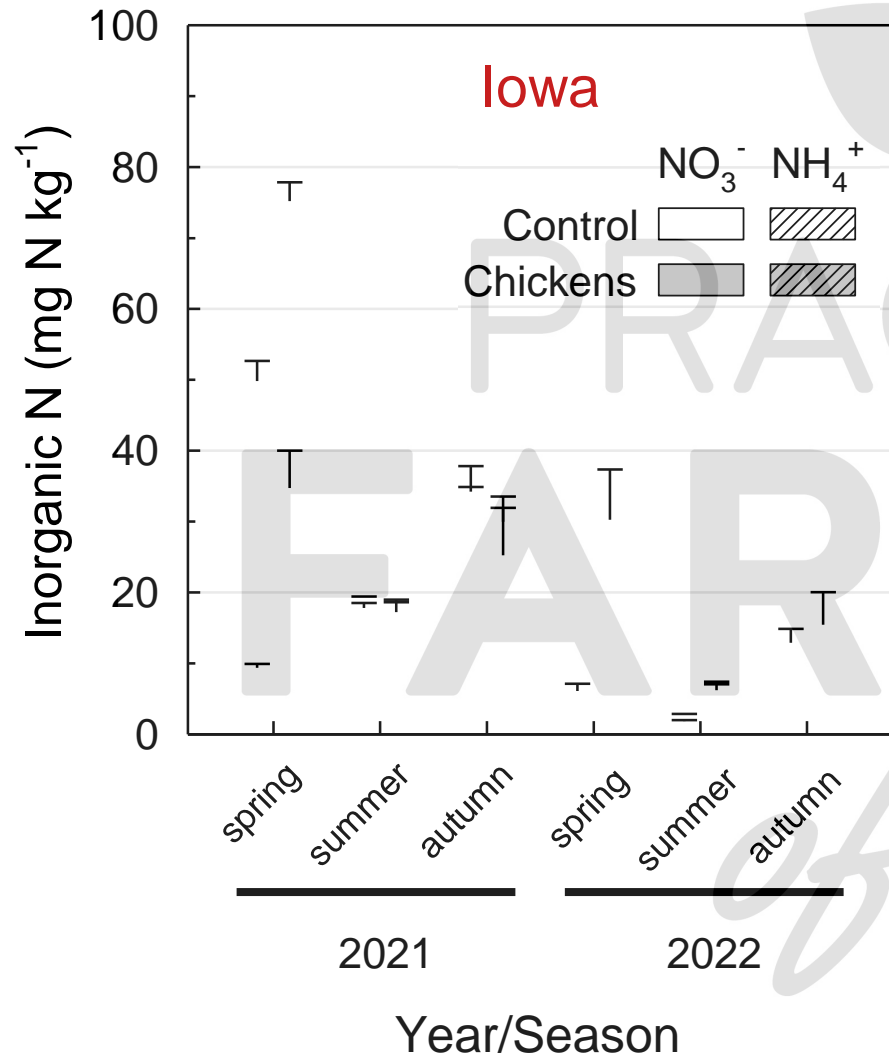
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Earthworm Count, Spring 2023



Plant-available N

+13 to +34 lbs N / acre



TAKE-HOME SO FAR

- Chickens could be integrated into vegetable rotations with reasonable expectations on meat quantity and quality
- Watch for weed growth and bare ground after grazing
- No positive *Salmonella* samples in soil or vegetables
- Summer cover crop may add additional soil health benefits
- Additional ~13-34 lbs N/ acre from chickens



PRACTICES
FARMERS
of Iowa





PRactical
FARMERS





PRAGMATIC FARMERS

010w





FARMERS







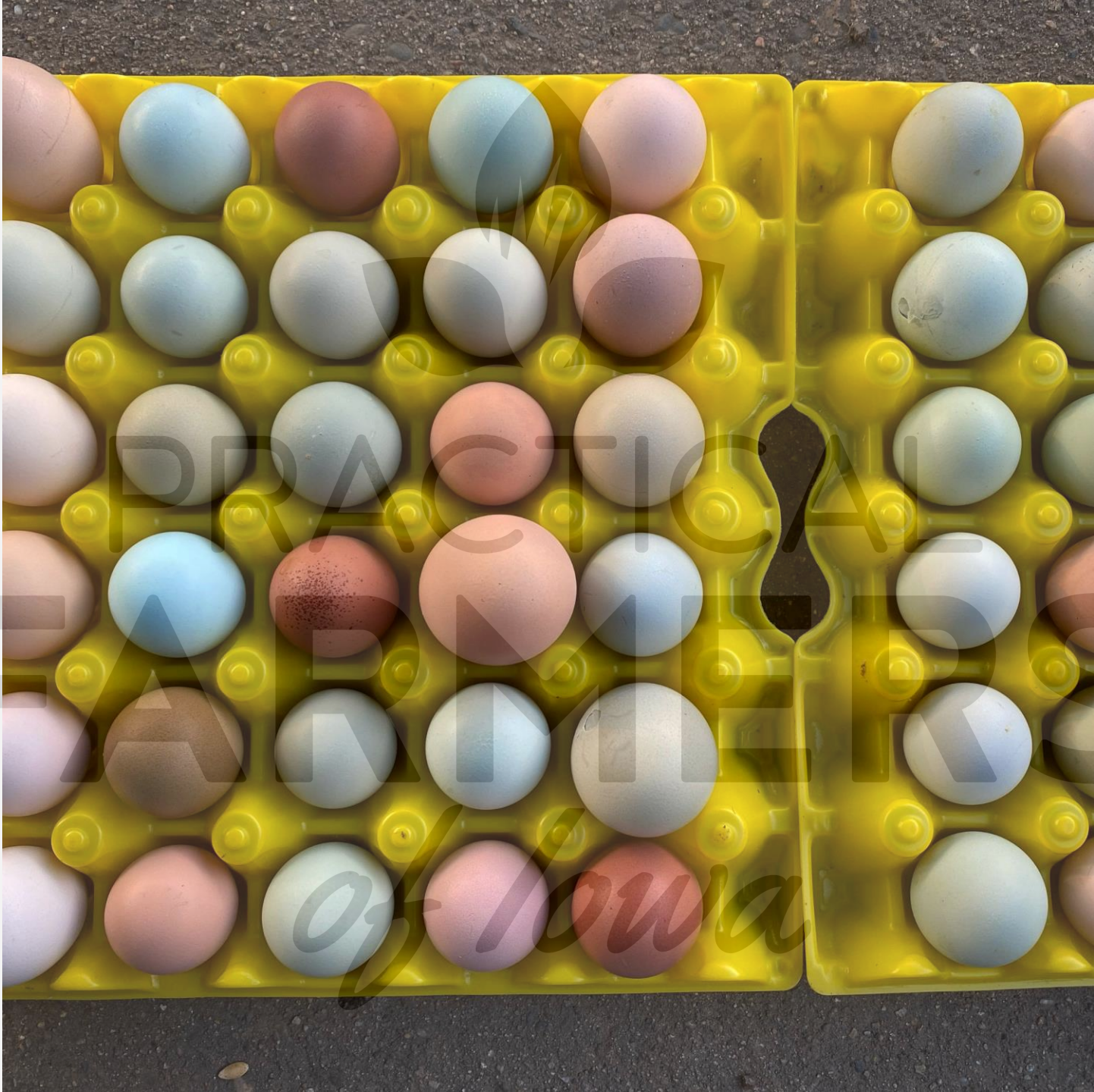
PRACTICE

F

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