

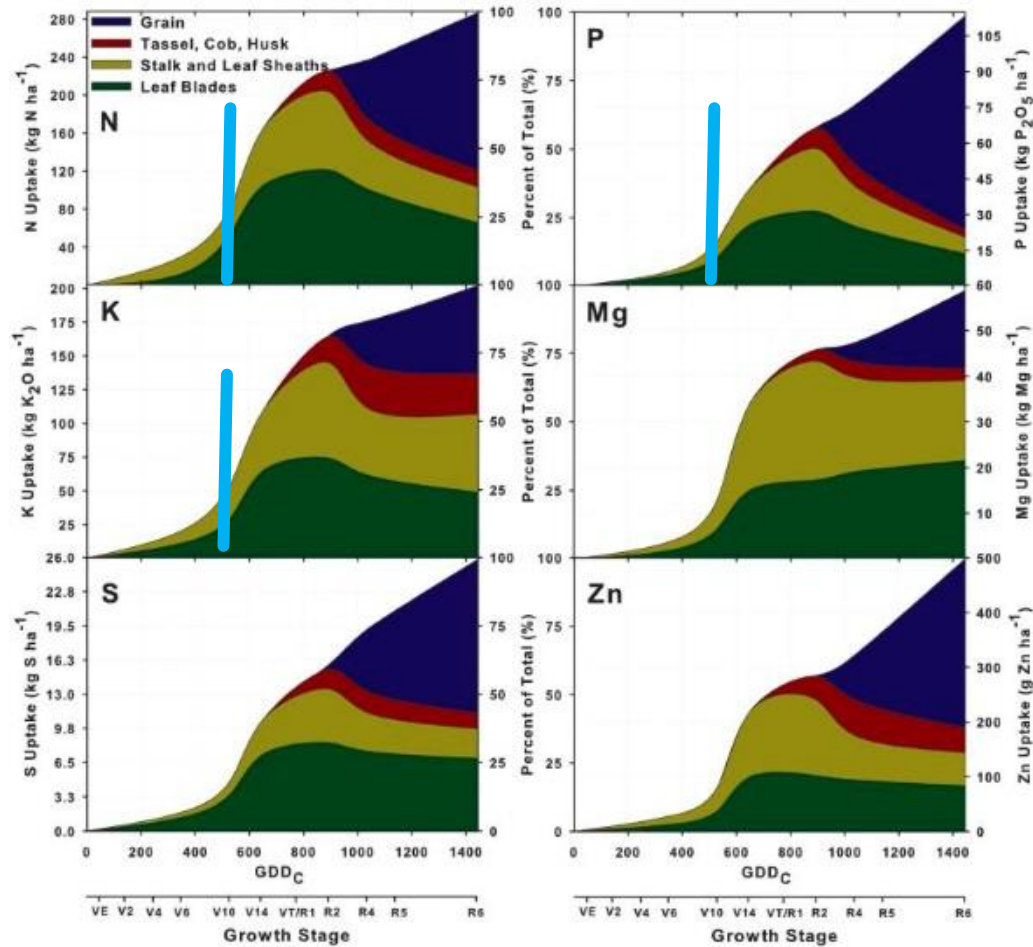


PHOSPHORUS, POTASSIUM, AND FOLIAR NUTRIENTS

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NUTRIENT UPTAKE



CURRENT LSU AgCENTER RECOMMENDATIONS

Conversion: $K \times 1.2 = K_2O$

Potassium - Alluvial

	Irrigated	Non-Irrigated
Alluvial Soil Test K Ratings†	K ₂ O lbs/ac	K ₂ O lbs/ac
VL	120	100
L	90	80
M	60	60
H	0	0

Potassium - Upland

	Irrigated	Non-Irrigated
Soil Test K Ratings	K ₂ O lbs/ac	K ₂ O lbs/ac
VL	100	80
L	80	60
M	60	40
H	0	0

†According to LSU AgCenter STPAL sufficiency data.

CURRENT LSU AgCENTER RECOMMENDATIONS

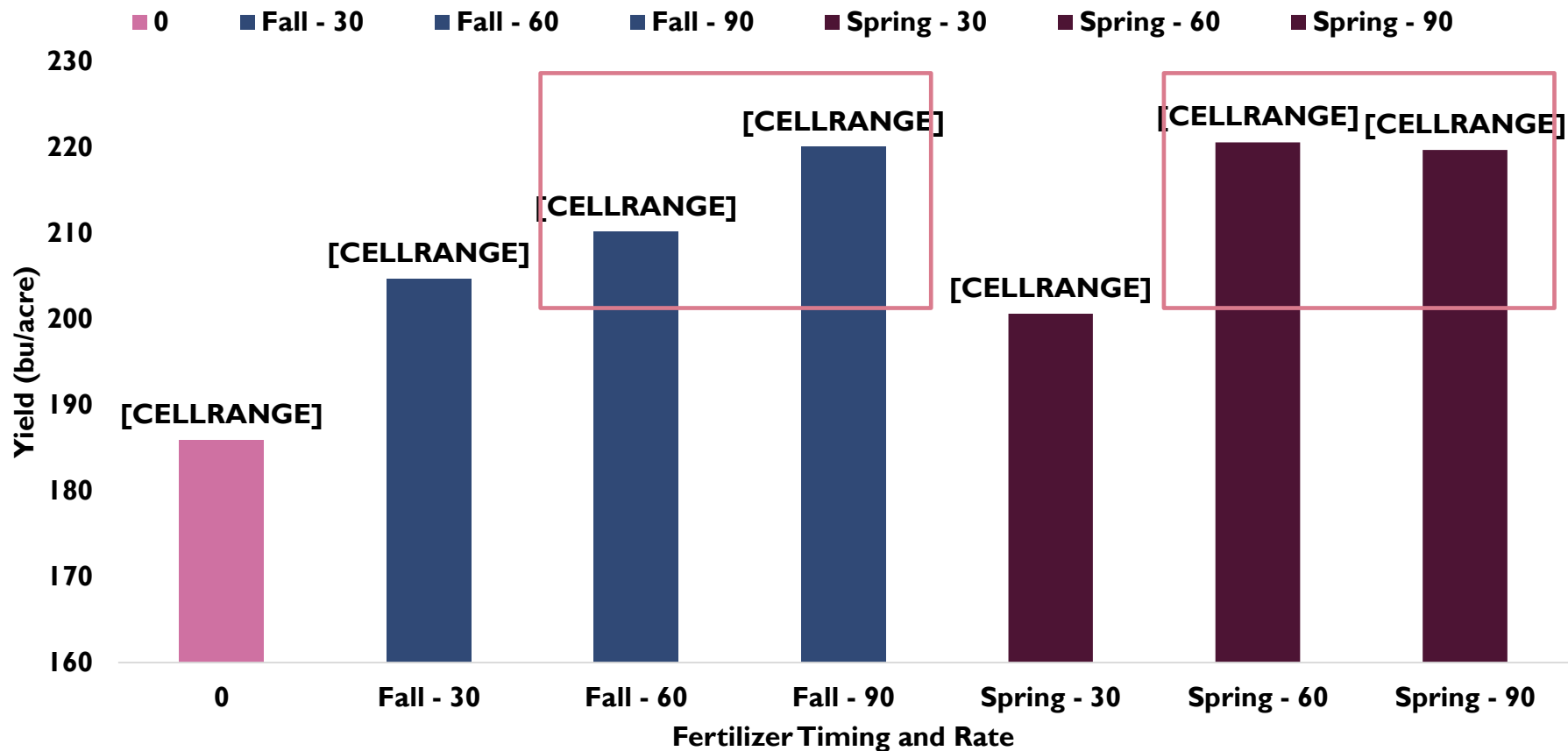
	Alluvial – Irrigated	Alluvial – Non-Irrigated	Upland – Irrigated	Upland – Non-Irrigated
Soil Test P	P₂O₅ lbs/ac	P₂O₅ lbs/ac	P₂O₅ lbs/ac	P₂O₅ lbs/ac
10	120	100	100	80
20	90	80	80	60
35	60	60	60	40
>35	20	20	20	20

TRIAL SETUP

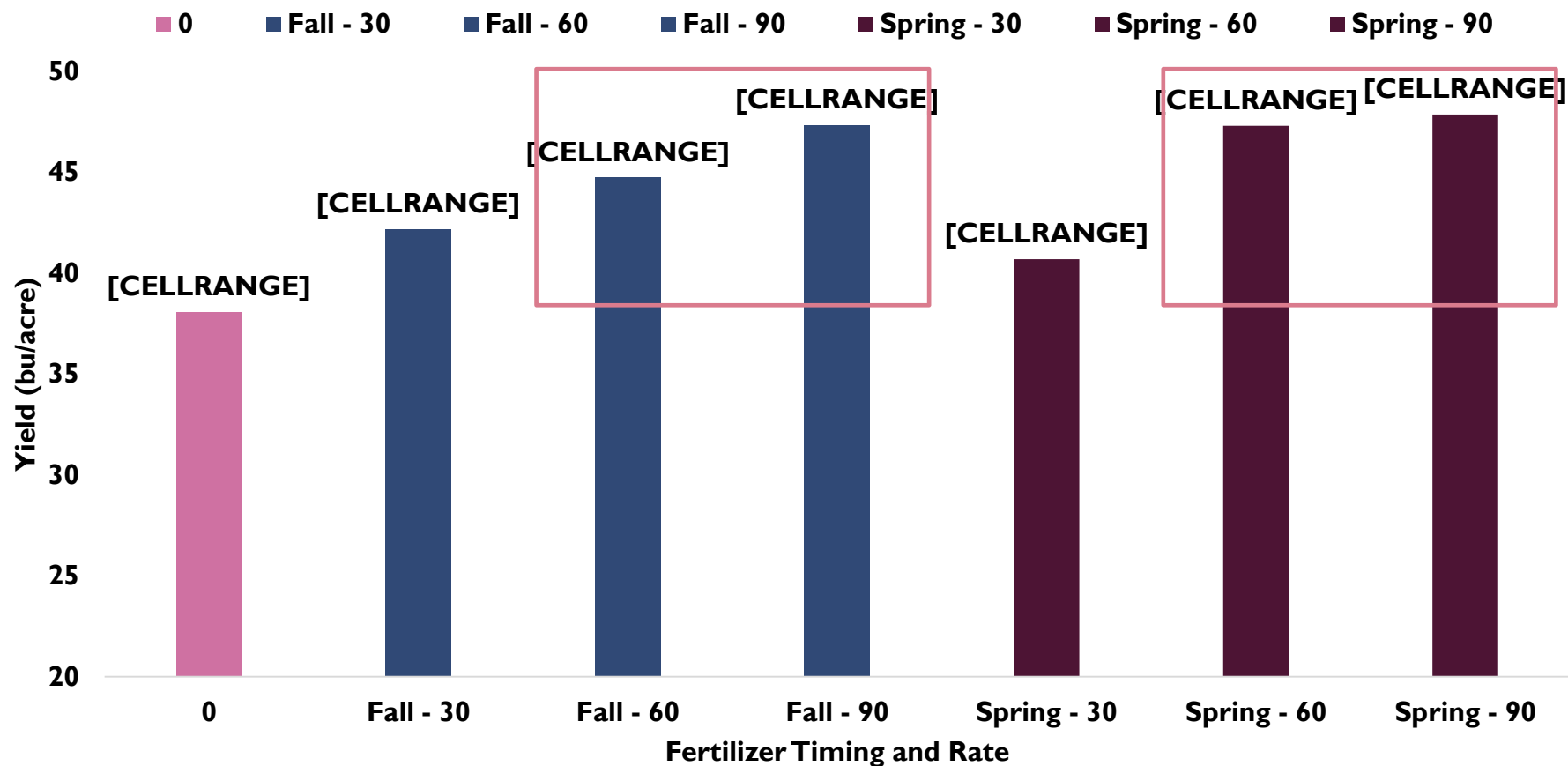
FALL VERSUS SPRING PHOSPHORUS AND POTASSIUM

- Initiated at Winnsboro, LA
 - Gigger-Gilbert Silt Loam
- Corn: Pioneer 1319HR
- Soybeans: Pioneer 94Y82
- Soil Test Recommendation
 - 40 lbs K₂O/acre
 - 40 lbs P₂O₅/acre
- P and K Rates
 - 0
 - 30 and 30
 - 60 and 60
 - 90 and 90
- Also collected tissue and grain samples to determine if P or K was still deficient – Not analyzed

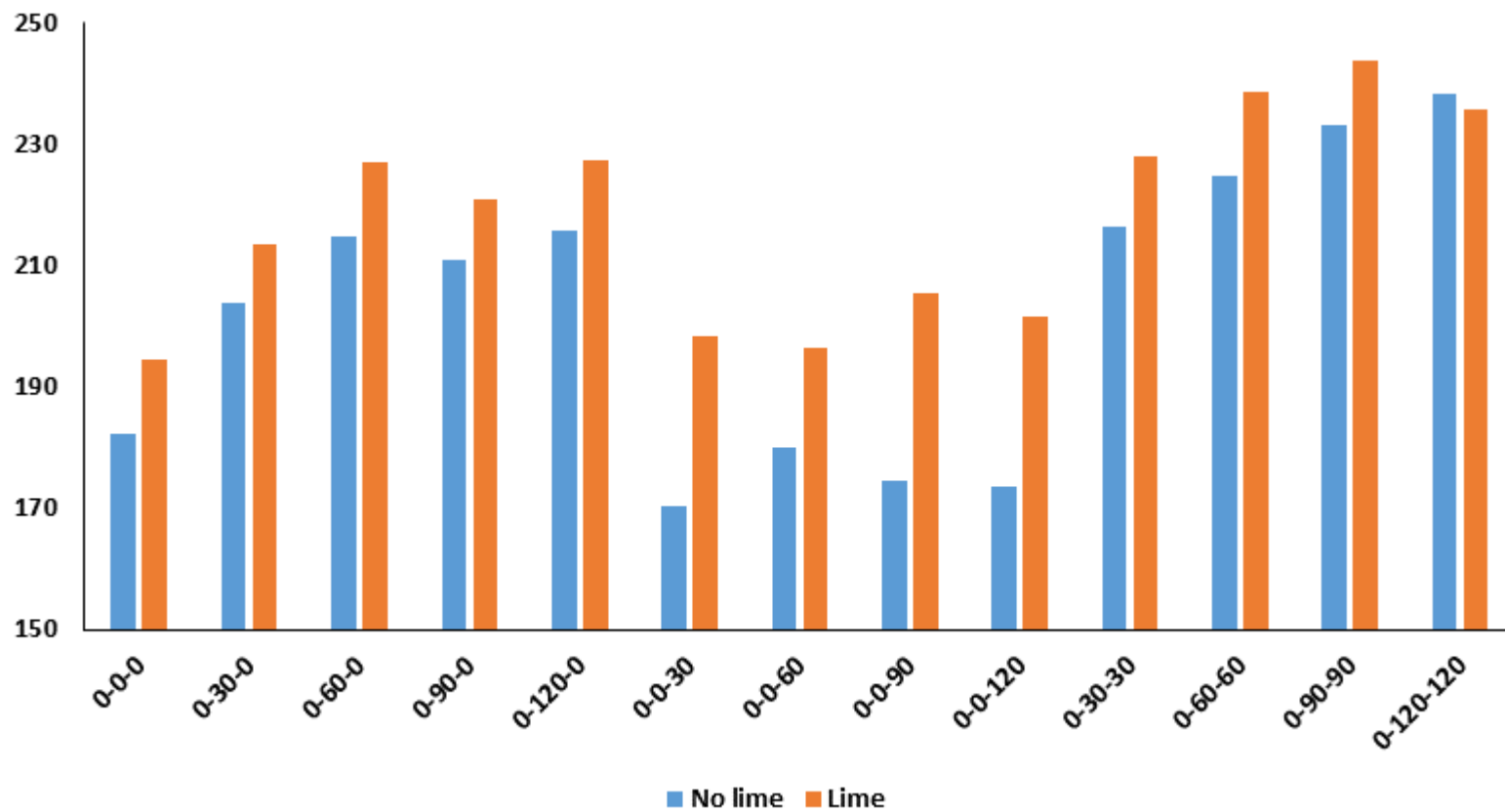
FALL VS SPRING - CORN



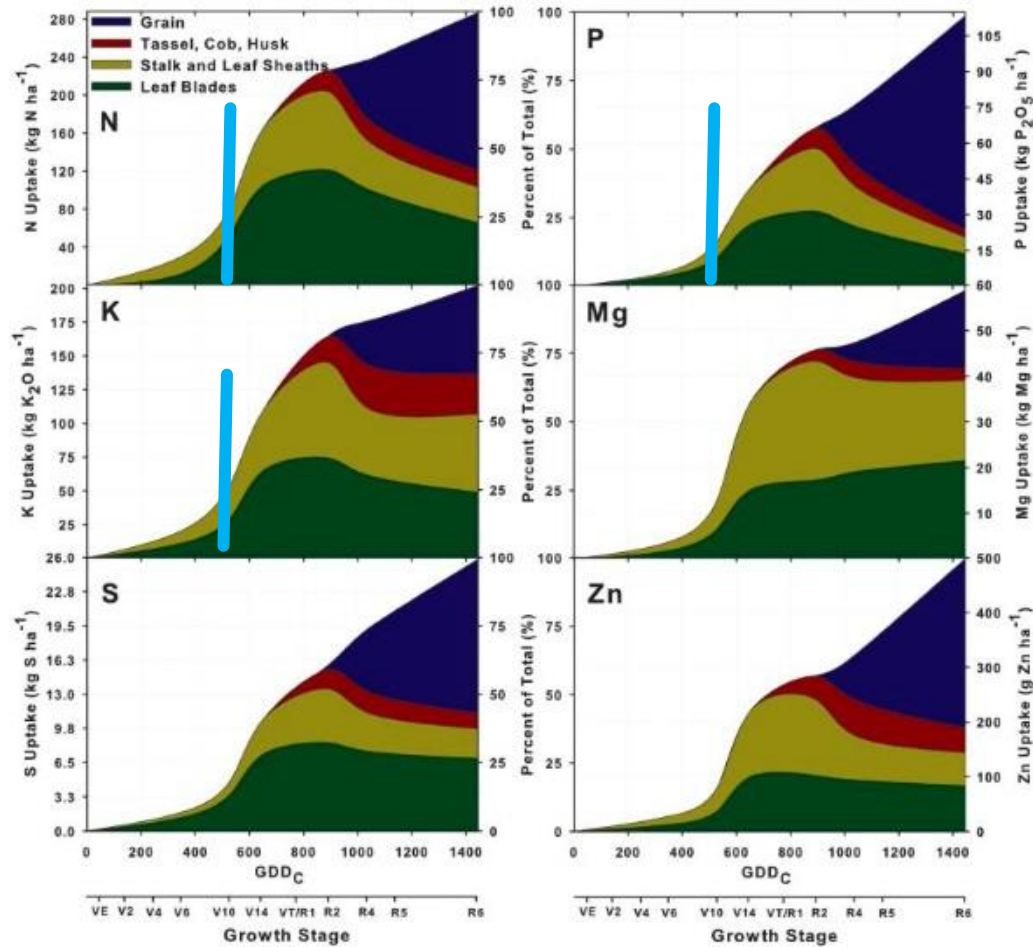
FALL VS SPRING - SOYBEAN



P, K, AND LIME



NUTRIENT UPTAKE



CROP NUTRIENT NEEDS

- Having the necessary P and K available in the soil is critical for optimum growth
- Corn – Peak uptake before Tasseling
 - K ~ 4.5 lb K/acre/day
 - P ~ 0.6 lb P/acre/day
- Soybean – Maximum daily uptake
 - K ~ 4.1 lb K/acre/day
 - P ~ 0.4 lb P/acre/day

FOLIAR FERTILIZERS

- 5% N, 3.5% S, 0.3% B, 3.0% Mn, and 3.0% Zn
- Density = 10.5 lbs/gallon
- Recommendation of 1.5 pints aerially and 1.5 quarts by ground

How to convert % to lb/acre

- $[\text{Density (lbs/gallon)}] \times [\text{Rate (gallons/acre)}] = \text{lb/acre}$
- $(\text{lb/acre}) \times (\% \text{ of Nutrient}) = \text{lb N/acre}$
- $10.5 \text{ lbs/gal} \times 0.125 \text{ gal/acre} = 1.3125 \text{ lb/acre}$
- $1.3125 \text{ lb/acre} \times 0.05 = 0.066 \text{ lb N/acre}$
- = **0.033% of the recommended N rate at 200 lb N/acre**

FOLIAR FERTILIZERS

1.5 pints/acre

- 5% N, 3.5% S, 0.3% B, 3.0% Mn, and 3.0% Zn
 - N=0.066 lb N/acre
 - S=0.046 lb S/acre
 - B=0.0039 lb B/acre
 - Mn=0.039 lb Mn/acre
 - Zn=0.039 lb Zn/acre

1.5 quarts/acre

- 5% N, 3.5% S, 0.3% B, 3.0% Mn, and 3.0% Zn
 - N=0.13 lb N/acre
 - S=0.092 lb N/acre
 - B=0.0079 lb B/acre
 - Mn=0.079 lb Mn/acre
 - Zn=0.079 lb Zn/acre (23 % of need)

CORN FERTILITY NEEDS – 200 BUSHEL YIELD

Nutrient	Grain	Stover	Total	Foliar % of plant need
N	160	68	228	0.057
P	76	19	95	
K	49	200	249	
Mg	11	28	39	
S	12	9	21	0.438
Zn	0.133	0.2	0.333	23.72
B	0.04	0.133	0.173	4.56
Mn	0.093	0.44	0.533	14.82
Fe	0.08	1.47	1.55	
Cu	0.027	0.12	0.147	

BURN ONE DAY AFTER APPLICATION



FOLIAR TRIALS - 2014

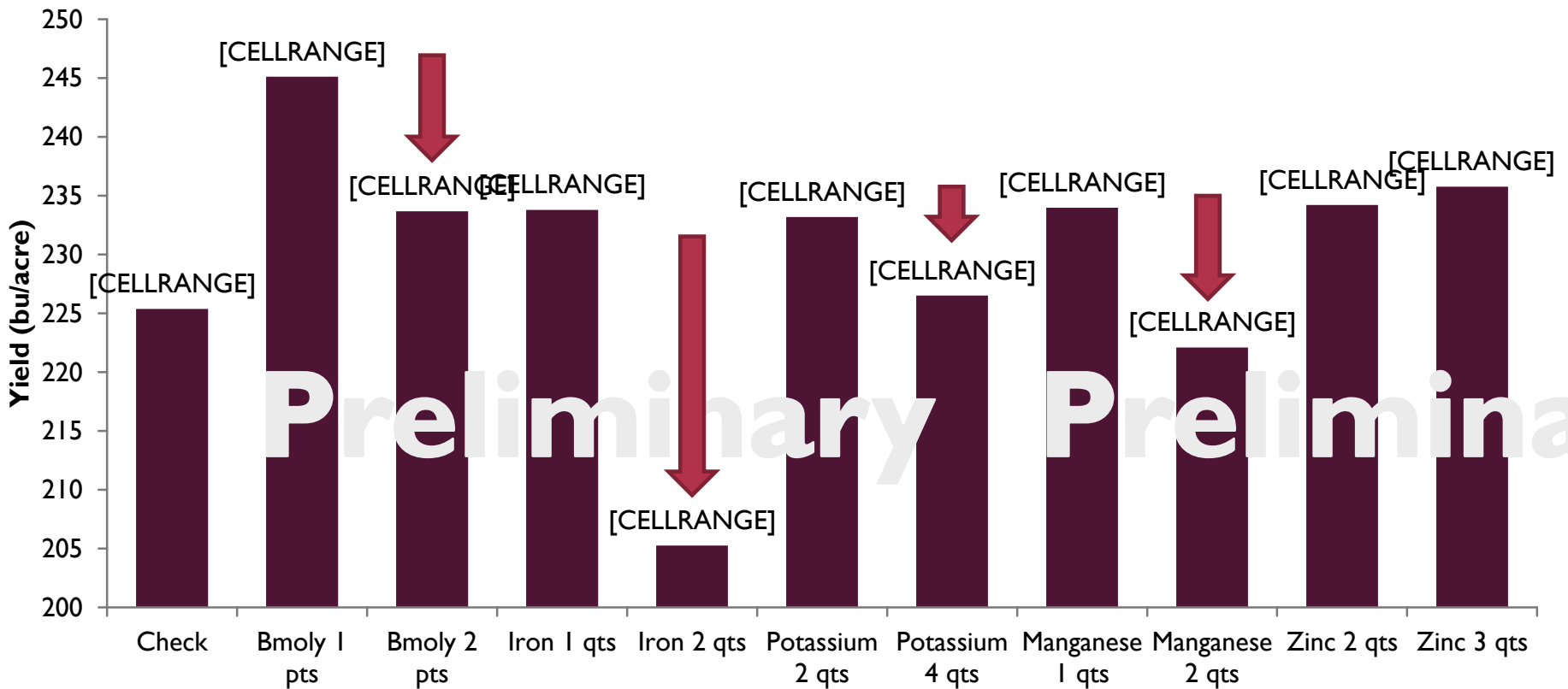
■ Corn Trial

- Initiated as a PXRF trial
- Foliar fertilizers were applied at V6 growth stage
- All treatments were applied with equivalent to 12 gallons water/acre
- Leaf samples were collected for 3 days following application

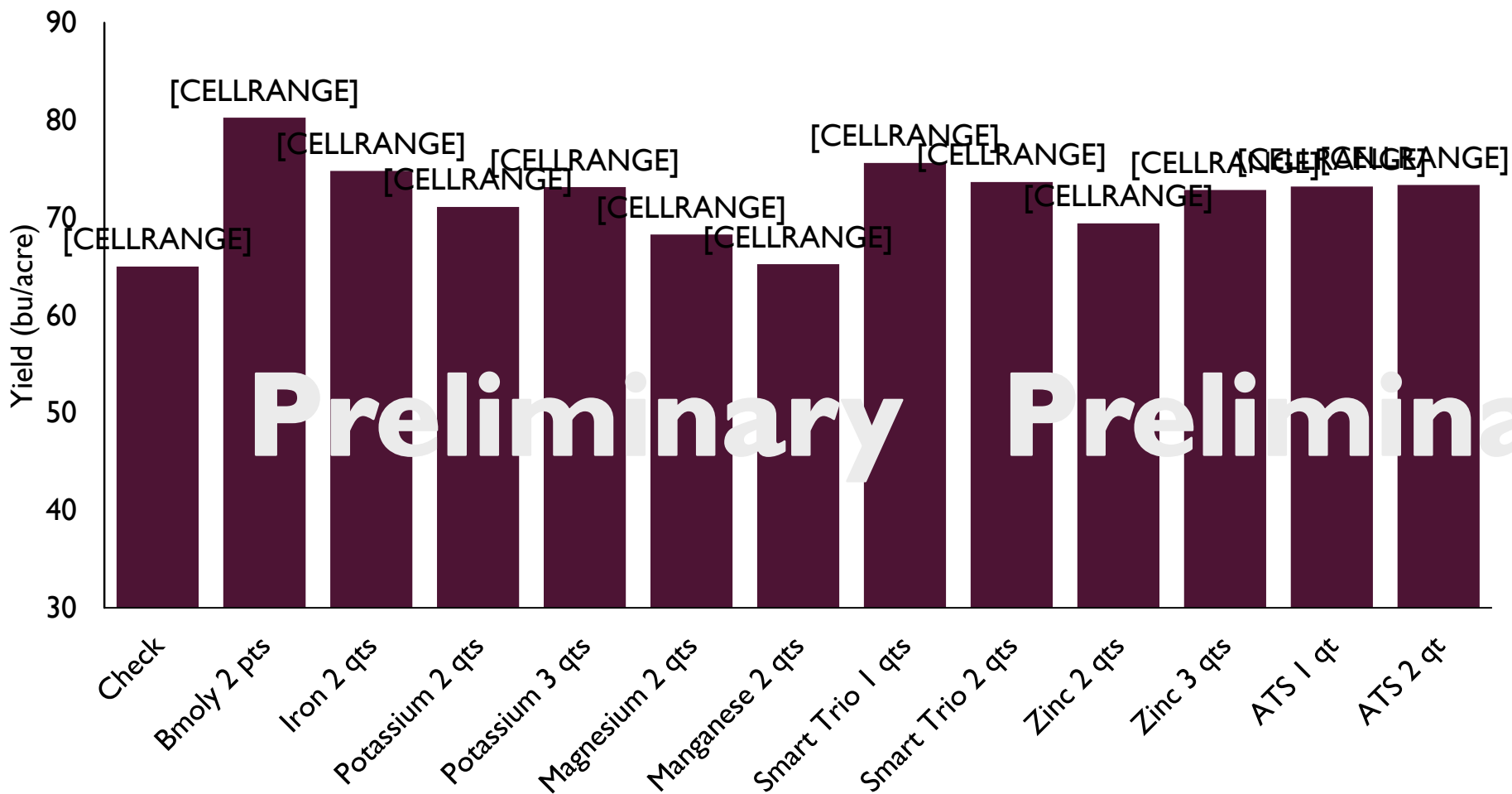
■ Soybean Trial

- Initiated as a PXRF trial
- Foliar fertilizers were applied at V3/4 growth stage (BEFORE FLOWERS)
- All treatments were applied with equivalent to 12 gallons water/acre
- Leaf samples were collected for 3 days following application

CORN FOLIAR FERTILIZER - 2014



SOYBEAN FOLIAR FERTILIZER - 2014



SUMMARY

- For both corn and soybean data from 2014
 - Spring applied P and K was able to yield as well at the 60 lbs rate as the 90 lbs rate
 - Fall applied P and K required 90 lbs to achieve the same yields as 60 lbs applied in the spring
- P and K applied separately with or without lime did not compare to those with P and K applied together
 - K was greatly influenced by lime when no P was applied
- Foliar applied nutrients have potential if the amount being applied is evaluated
 - Micronutrients are the more obvious route when selecting what will be beneficial
 - Too much can be bad = Toxicity or Burn
 - Must weigh the cost with potential yield benefits