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Winter Wheat

Each region has diversity in planting, harvesting, Soils, water availability, winter weather and fertilization

Old Wood Box Drill

Modern Metal Box Drill

Times change as do our farming practices

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No-Till with Yielder Drill

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We have came a long way in applying fertilizer

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We can broadcast, use streamers or fly it on

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And of course drilling seed and liquid fertilizer together

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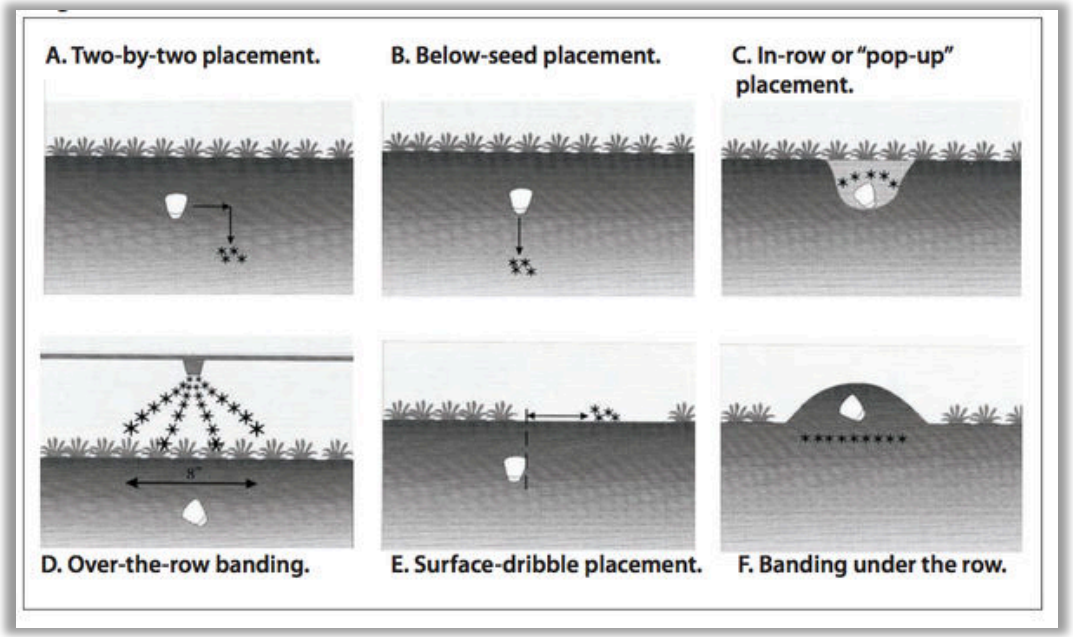
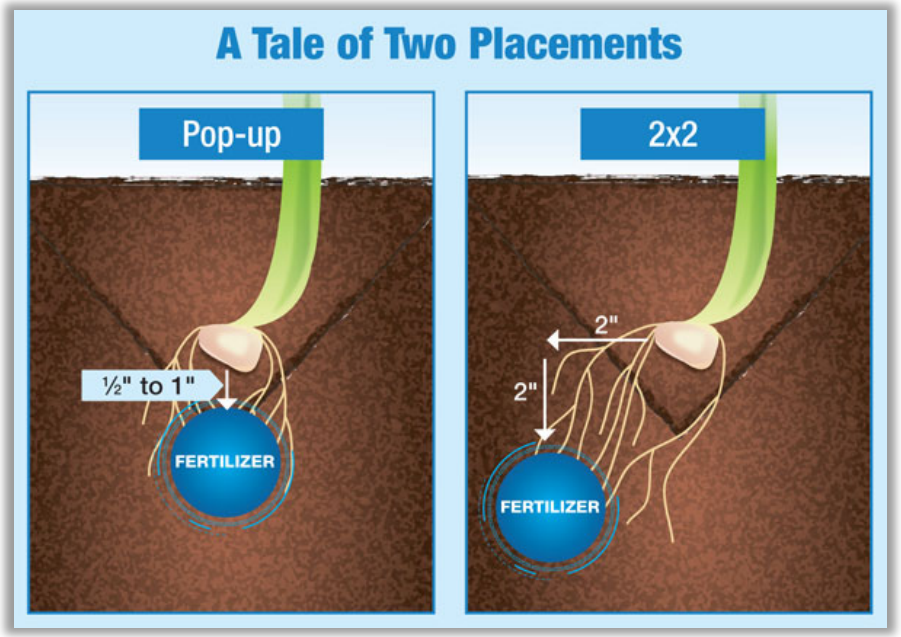
Lots of research has been done on placement and application methods by AgroLiquid





Visit the web site to get more specific data

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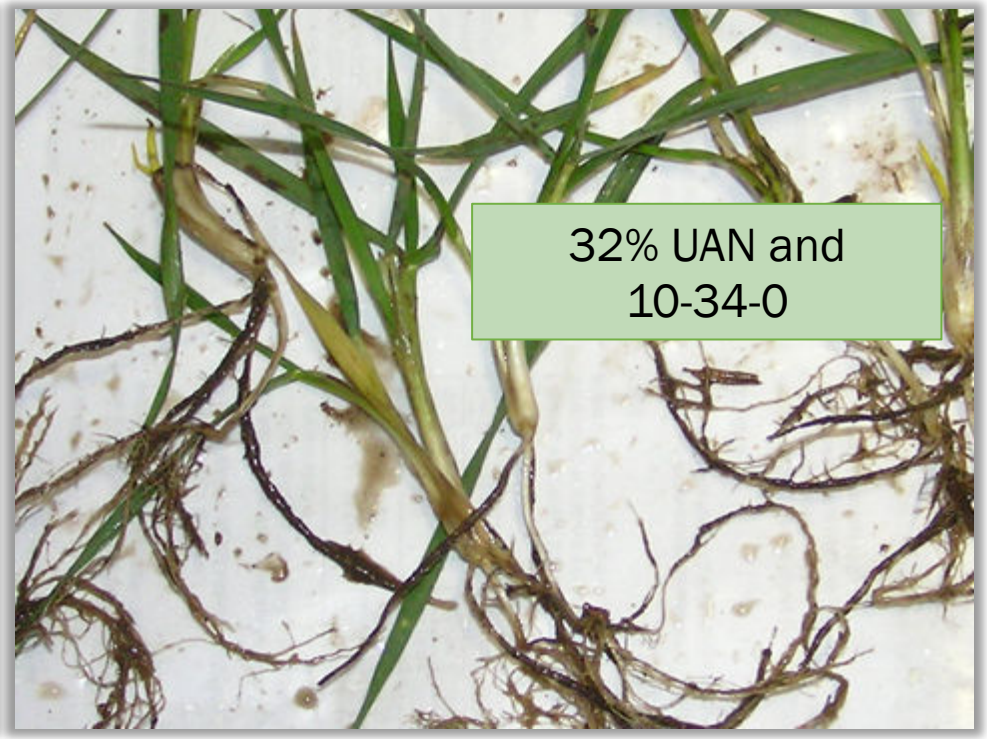
Research has proven seed and fertilizer placement makes a big difference

AgroLiquid is a safer and can be placed closer to the seed



High salts and higher application levels of conventional fertilizer can restrict root growth

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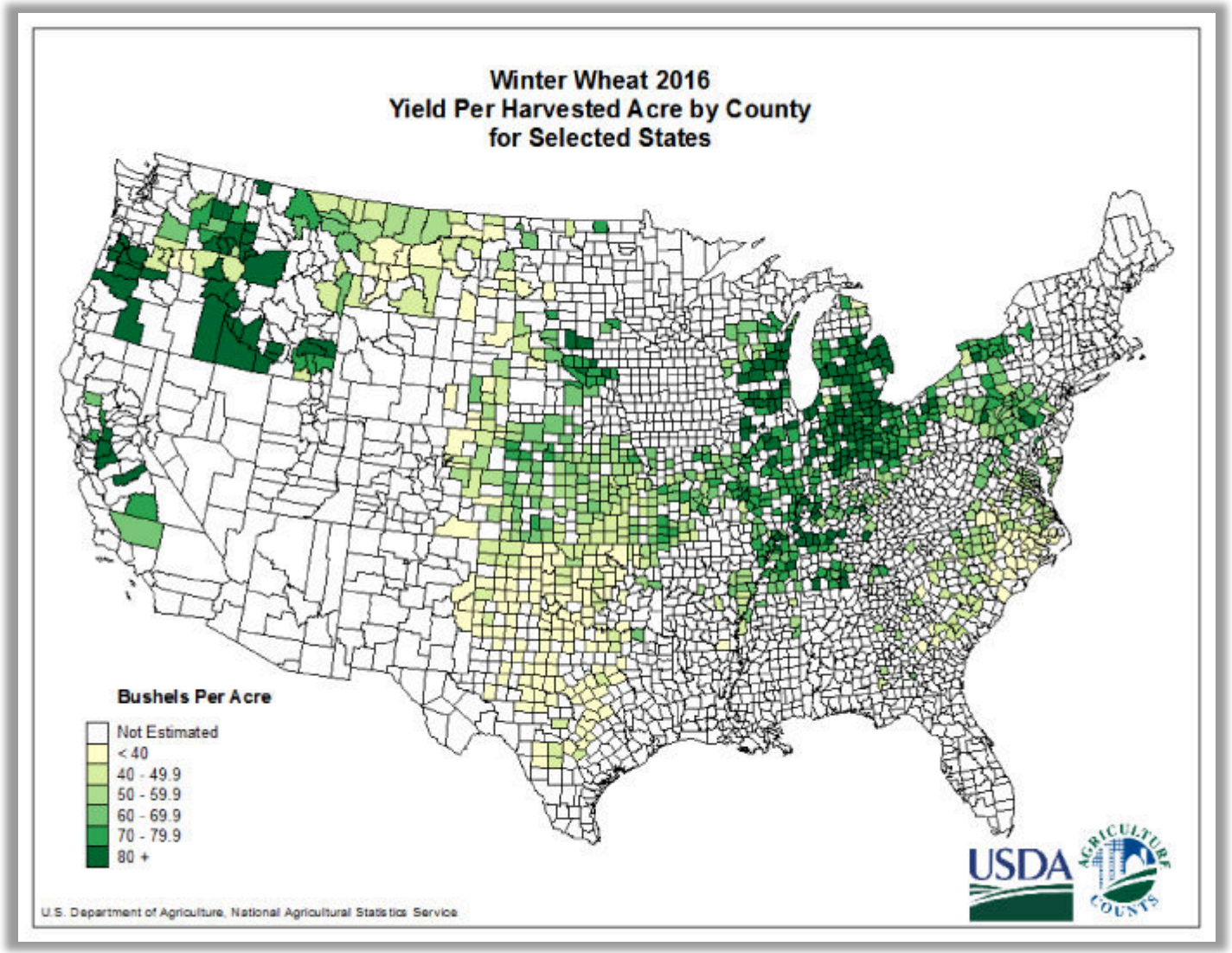
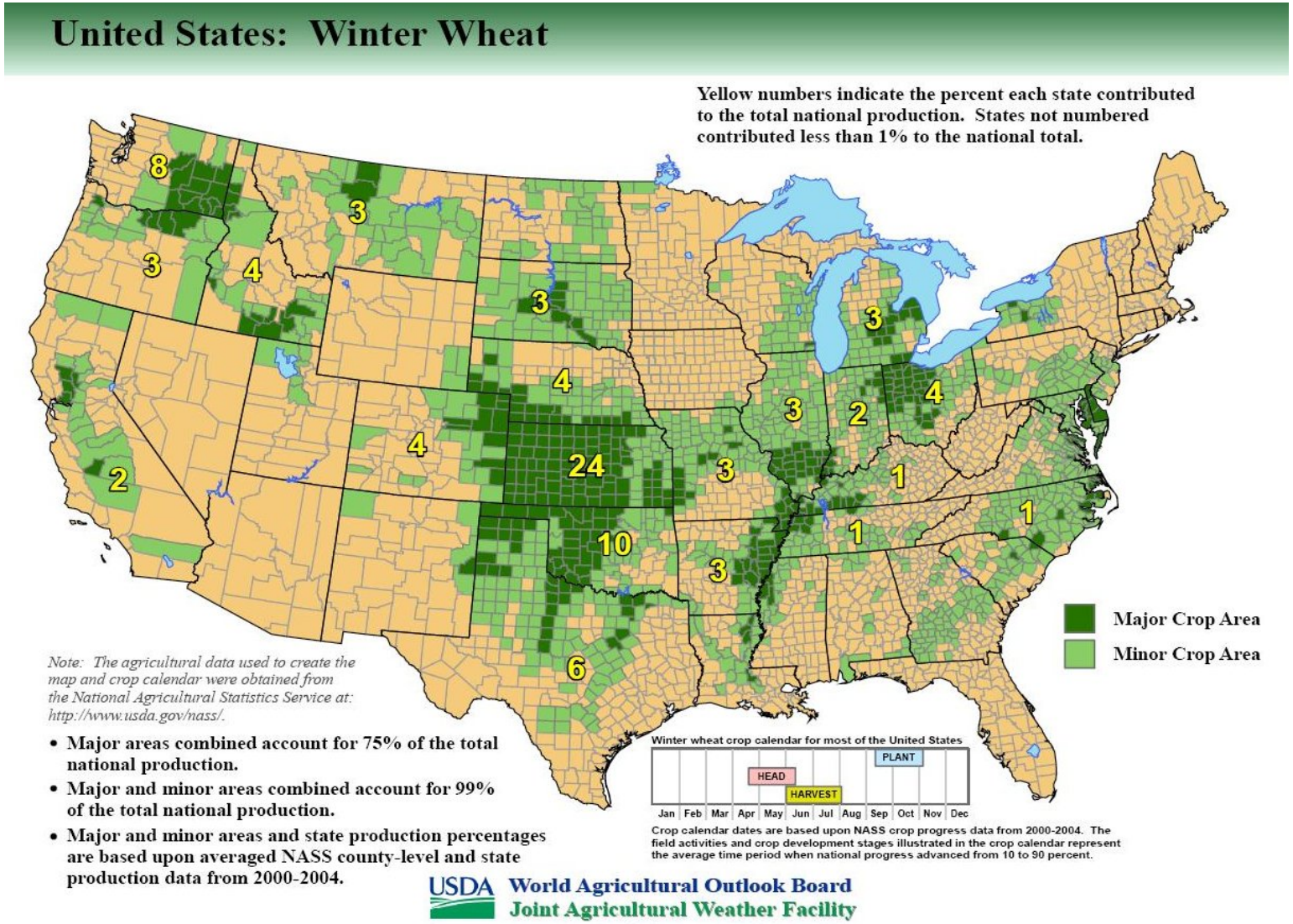
Where should we focus our efforts on Winter Wheat (Yield per county)



Percent of total national production



How can AgroLiquid perform better than the rest?

- The **Right Balance**
- The **Right Timing**
- The **Right Placement**
- The **Right Amount**
- The **Right Product** (and science)

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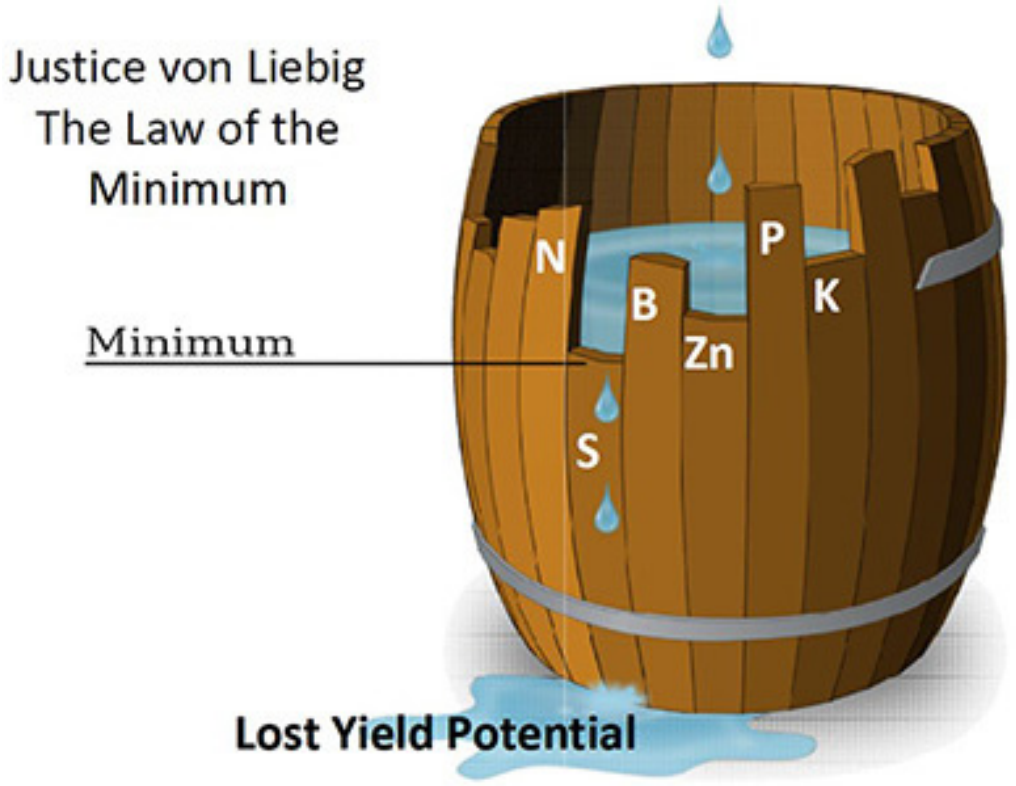
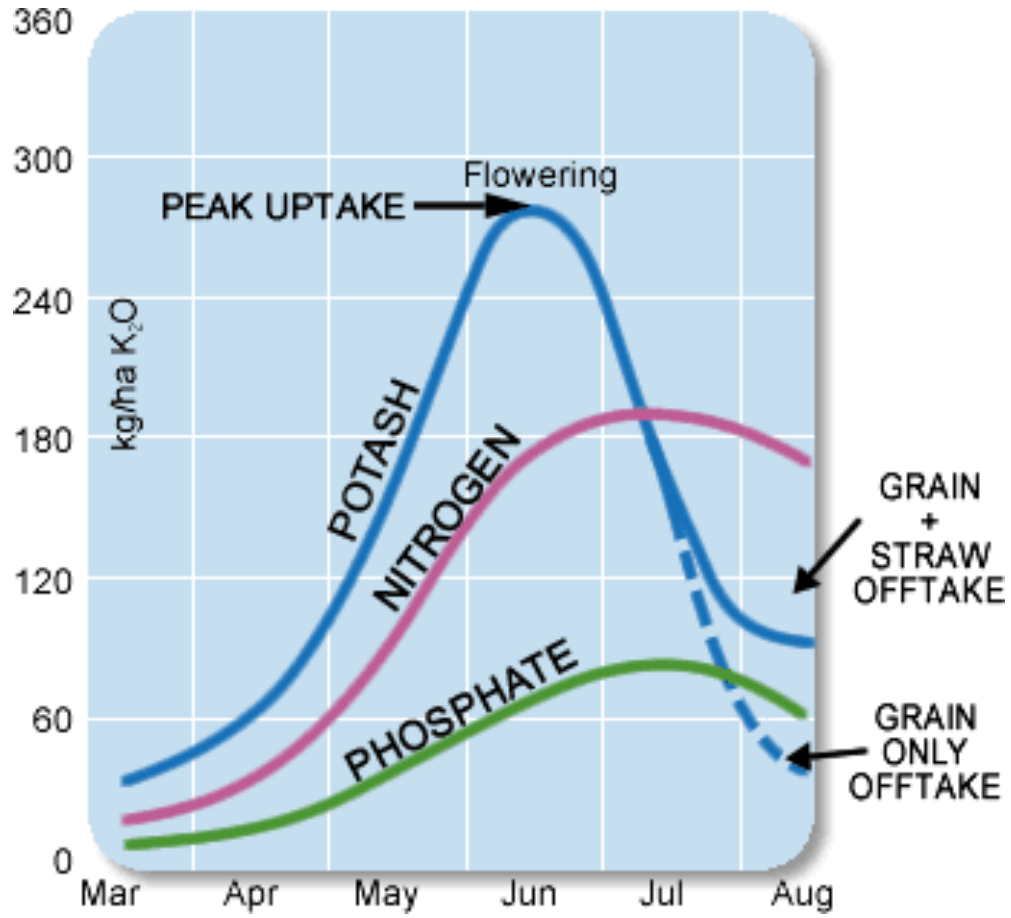
The Right Balance

- **NUTRIENT BALANCE** is a major factor in a proper fertility program
- A crop's yield potential is determined by the "most limiting nutrient"



The Right Time



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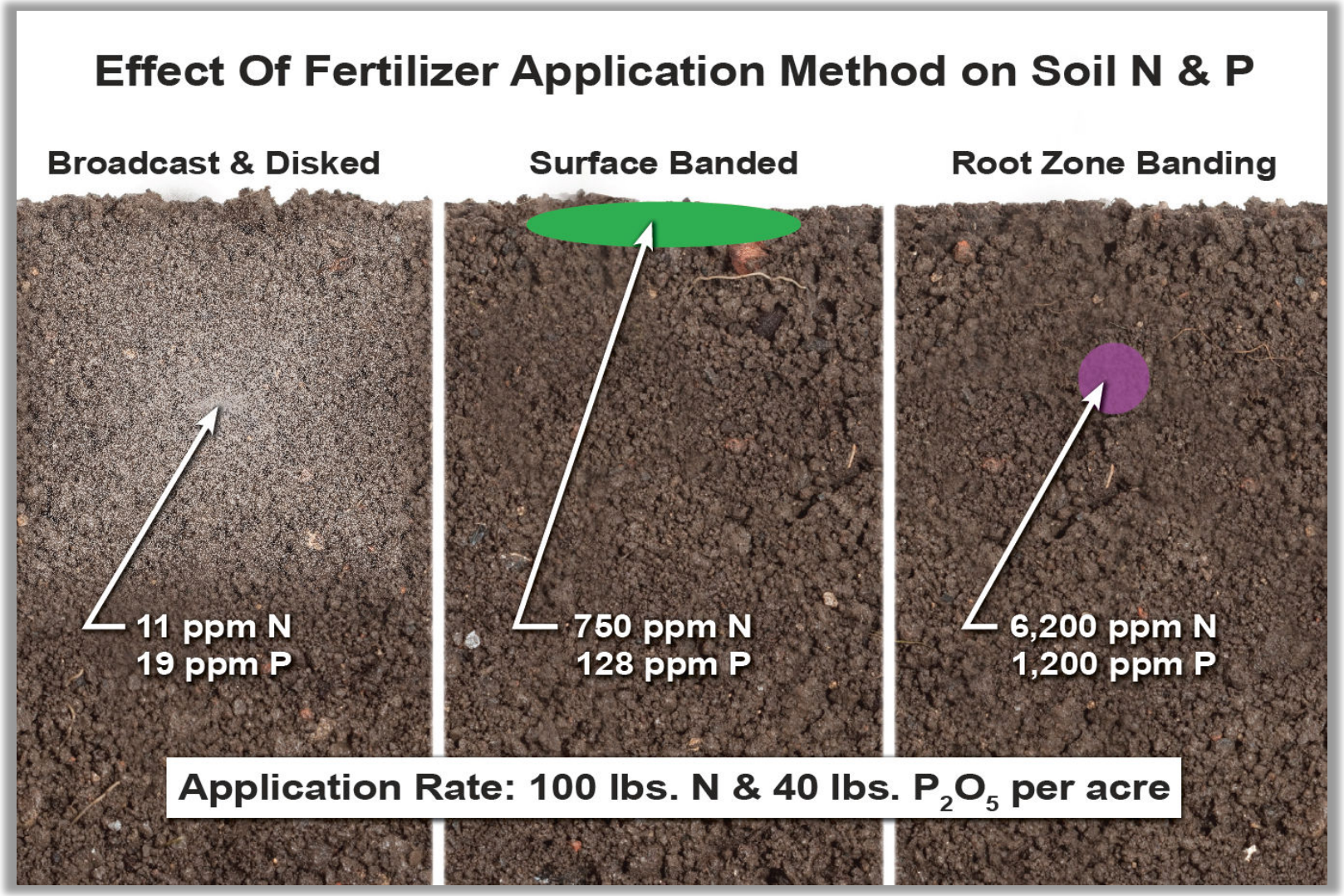
The Right Placement



The Right Amount

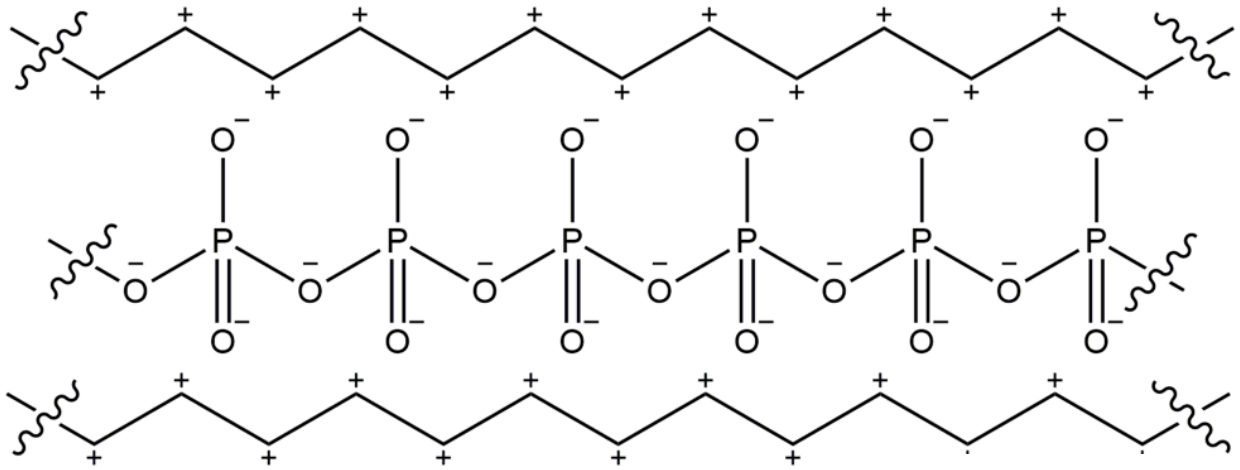
- Soil and Tissue Testing
- 30+ years of research across multiple cropping conditions and geographies
- **AgroLiquid provides a talented staff of agronomists, researchers, salesmen, and retailers to help bring together all components of your fertility program!**

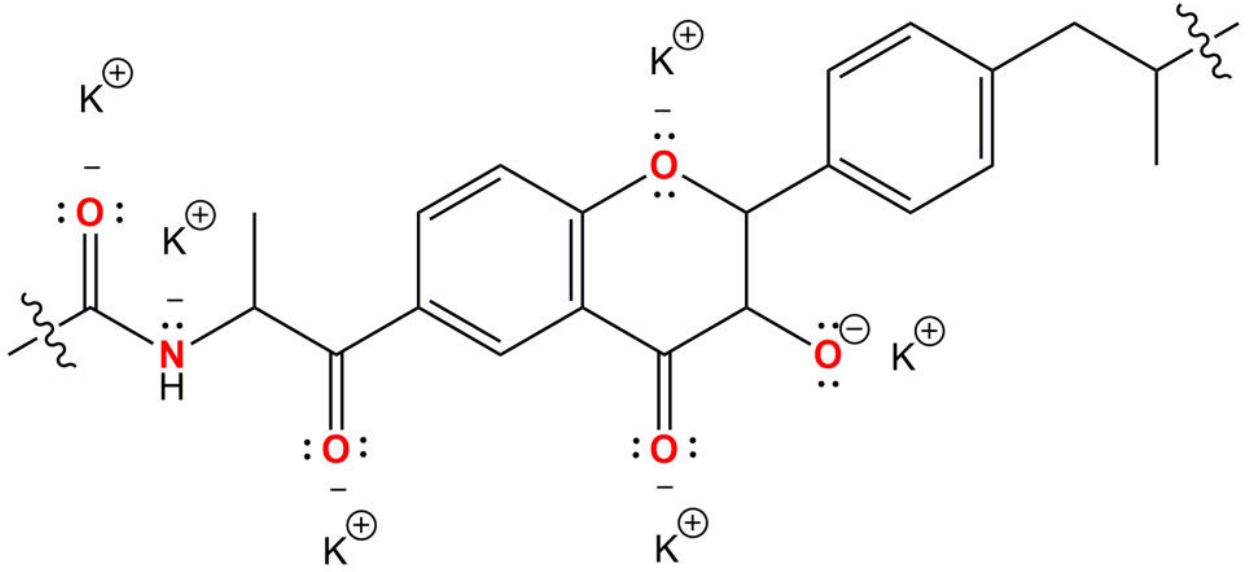
The Right Products: What to Look For

- Consistent manufacturing
- Quality raw materials
- Clean, easy to use, and less corrosive
- Low potential for plant injury
- Research proven technology

- With many products hitting the market with these qualities, what separates AgroLiquid?

Flavonol Polymer Technology





The Right Products!

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Nutrient Uptake

Box A
Average Nutrient Content in Dryland Wheat: Total Uptake and Removal in Grain and Straw.[1]

Nutrient	Total uptake	Removal in grain	Removal in straw
	—lbs per bushel of yield—		
Nitrogen (N)			
9.0% protein (soft white)	1.35	0.95	.40[2]
11.5% protein (hard red)	1.50	1.20	0.30
12.5% protein (hard white)	1.65	1.32	0.33
Phosphorus (P_2O_5)[3]	0.62	0.5	0.12
Potassium (K_20)[4]	1.55	0.35	1.2
Sulfur (S)	0.30	0.13	0.17
Chloride (Cl)	0.20	0.0	0.20

[1] Source: USDA-NRCS and the International Plant Nutrition Institute.

[2] Based on a N harvest index of 0.7 for soft white and 0.8 for hard red and hard white.

[3] To convert to lbs of elemental P multiply values by 0.44.

[4] To convert to lbs of elemental K multiply values by 0.83.

How Can AgroLiquid Help

- Reading the soil samples and tissue samples
- Making educated recommendations to help Balance the soil, improve base saturations
- Improving soil health with Bio-actives.
- Supplying efficient research proven nutrients

  Right Nutrient, Right Place, Right Time, Right Amount.

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What Nitrogen products do we have that fit?

N-Suite™

NResponse

eNhance

PRIMAGRO™ TECHNOLOGY N

HighNRG-N

http://www.agroliquid.com/products/n-suite/

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The PrimAgro line contains our proven plant nutrient products plus beneficial bacteria and fungi for soil life.

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Phosphorus Opportunity

Table 1
Phosphorous Fertilizer Recommendations for Dryland Winter Wheat

Soil Test P (ppm) 0 to 12-inch depth		Application rate lb P_2O_5/acre[1]
Acetate method	Bicarbonate (Olsen) method	
0 to 2	0 to 4	40
2 to 4	4 to 8	30
4 to 6	8 to 12	20[2]
6 to 8	12 to 16	10[2]
> 8	> 16	0[2]

[1] These recommendations assume fertilizer is banded below the soil surface. For broadcast or broadcast-incorporated applications multiply Table 1 rates by 2.

[2] Higher rates of P may be applied to build soil test levels for subsequent crops in the rotation. If desired, apply up to 1/2 crop removal rates in the categories indicated. Use the yield potential established earlier and estimates of P removal from Box A. Removal rates must be based on the grain only, unless straw is also removed from the field.

Phosphorus and other products

ProGerminator®

Micro 500™

Micro 600

Zinc

accesS™

S-Calate™

http://www.agroliquid.com/products/

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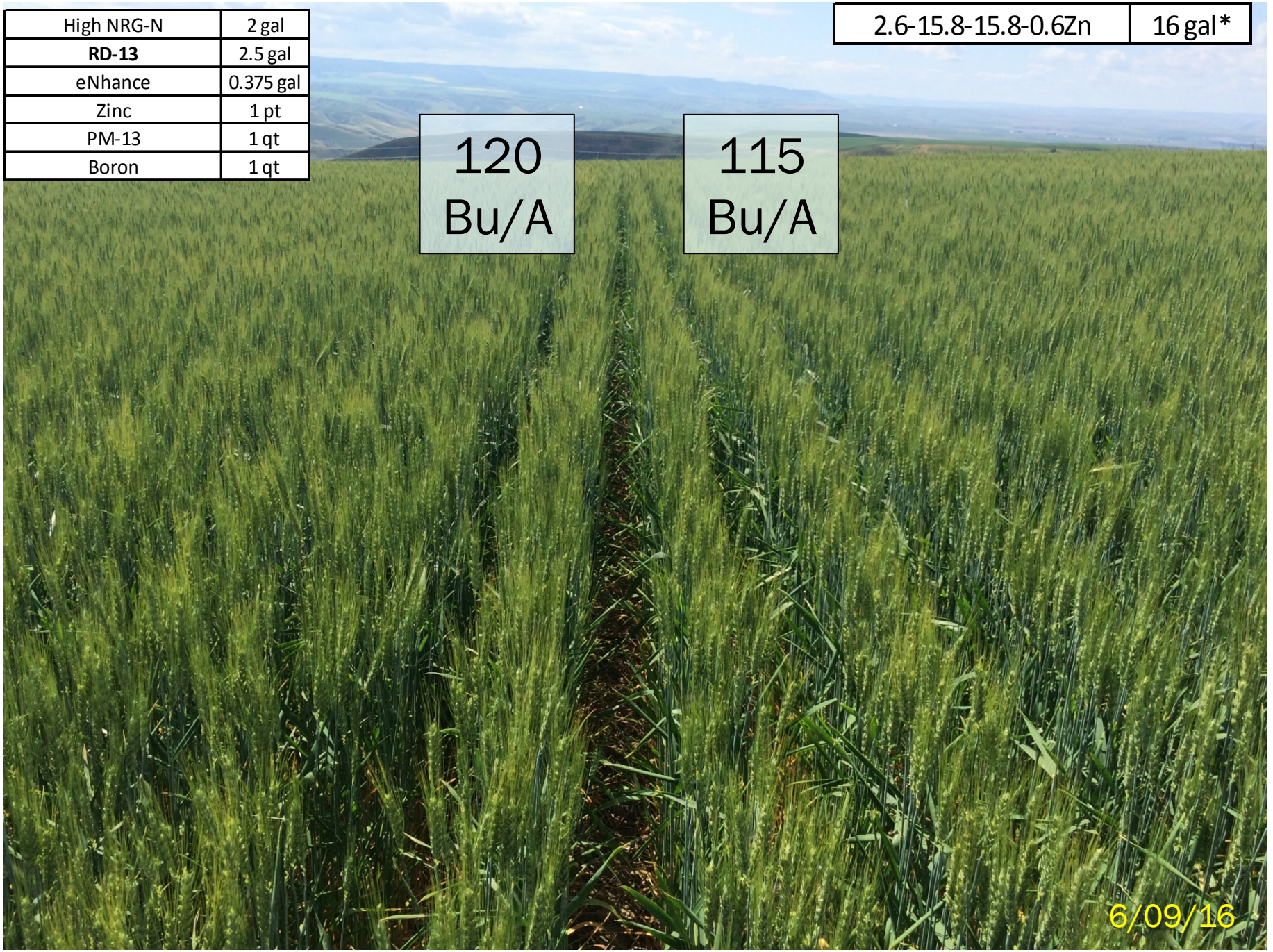
High NRG-N	2 gal
RD-13	2.5 gal
eNhance	0.375 gal
Zinc	1 pt
PM-13	1 qt
Boron	1 qt

2.6-15.8-15.8-0.6Zn	16 gal*



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2016-17 Winter Wheat Fertilizer Test

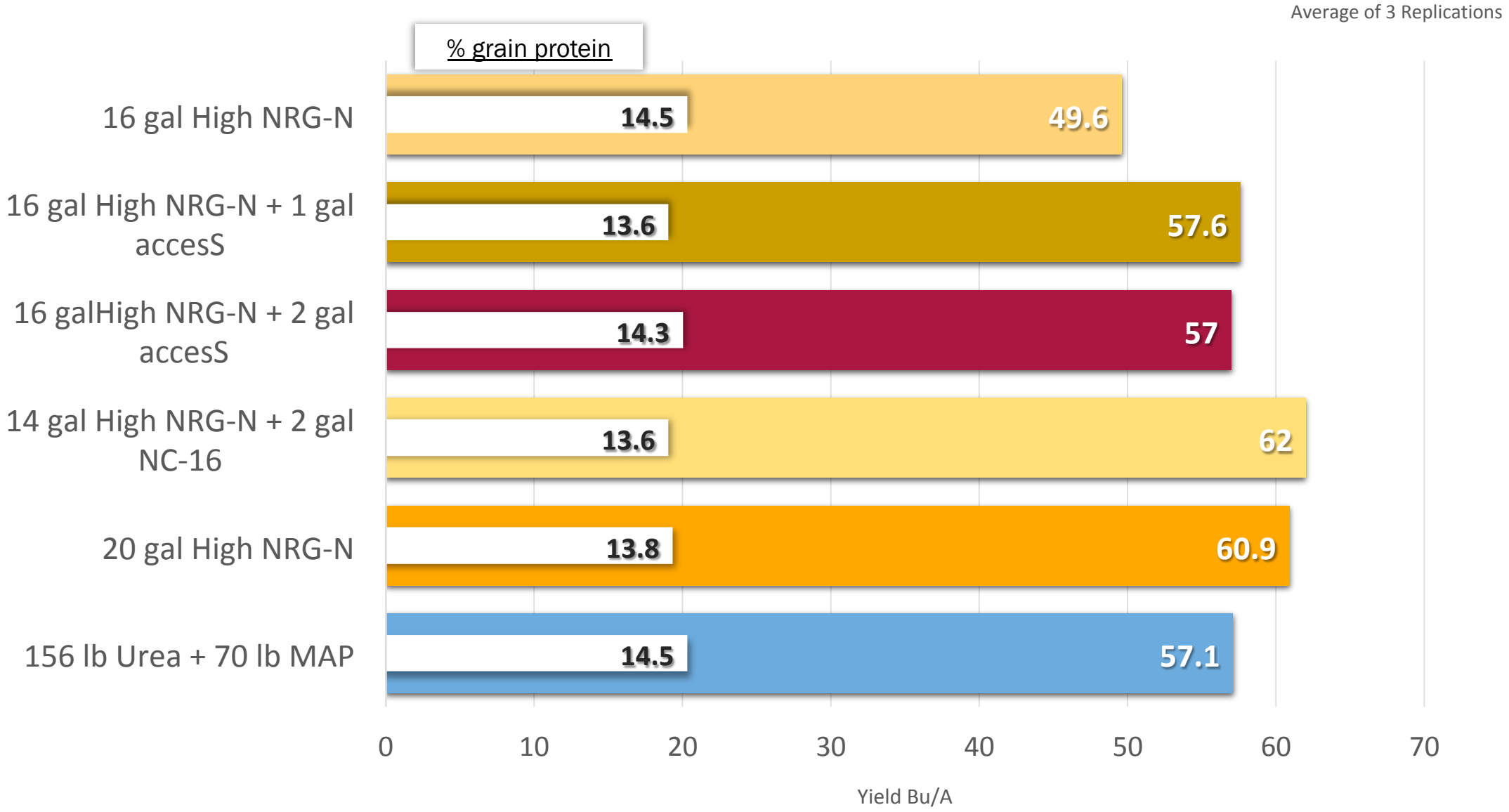
New Plan: Apply all of AgroLiquid in fall with drill

High NRG-N	25 gal	32%	11 gal
Pro-Germinator	3 gal	10-34-0	7.5 gal
S-Calate	2 gal	ATS	10 gal
Micro 500	0.25 gal	32% (TD):	11.5 gal

Wetter fall and winter than normal.
Grower reported that AgroLiquid side was yellow all spring, until shortly before our visit.

Nitrogen Fertilizer Comparisons in Spring Wheat

Fehringer Agriculture Consulting, Billings, MI - 2016



N fluids applied pre-plant with streamer nozzles. Also had 3.5 gal/A Pro-Germinator + 1 qt/A Micro 500 applied with drill. The dry fertilizer was broadcast pre-plant.

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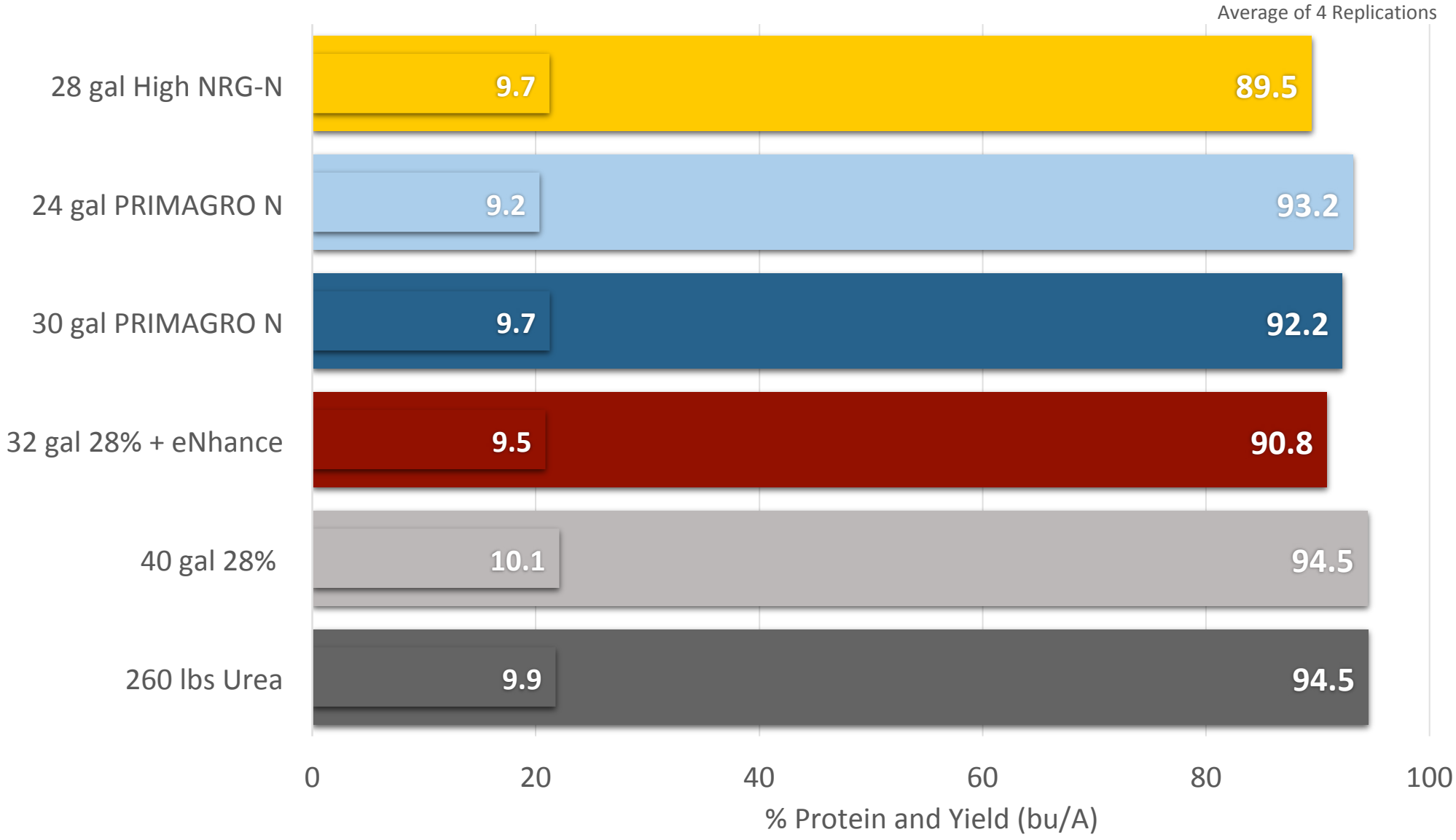
Nitrogen Fertilizer Source and Rate Comparison in Winter Wheat

North Central Research Station - 2017



All treatments included: 4 gal Pro-Germ. + 2 gal Kalibrate + 2 qt Miro 500 (drill)

17-508

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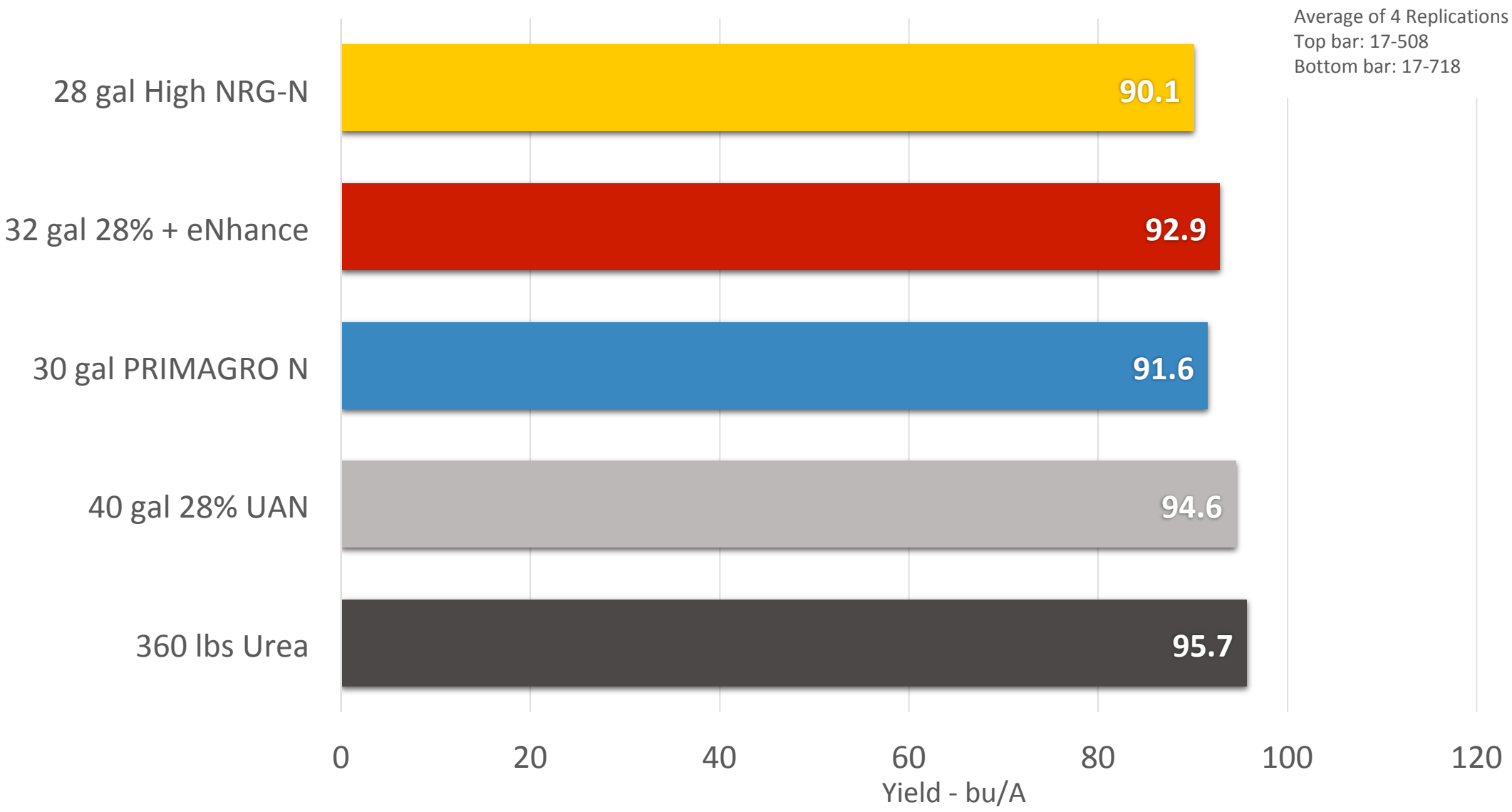
Nitrogen Source and Rate Comparison on Winter Wheat

North Central Research Station - 2017



All treatments included: 4 gal Pro-Germ. + 2 gal Kalibrate + 2 qt Micro 500 (drill)

17-718 and 508

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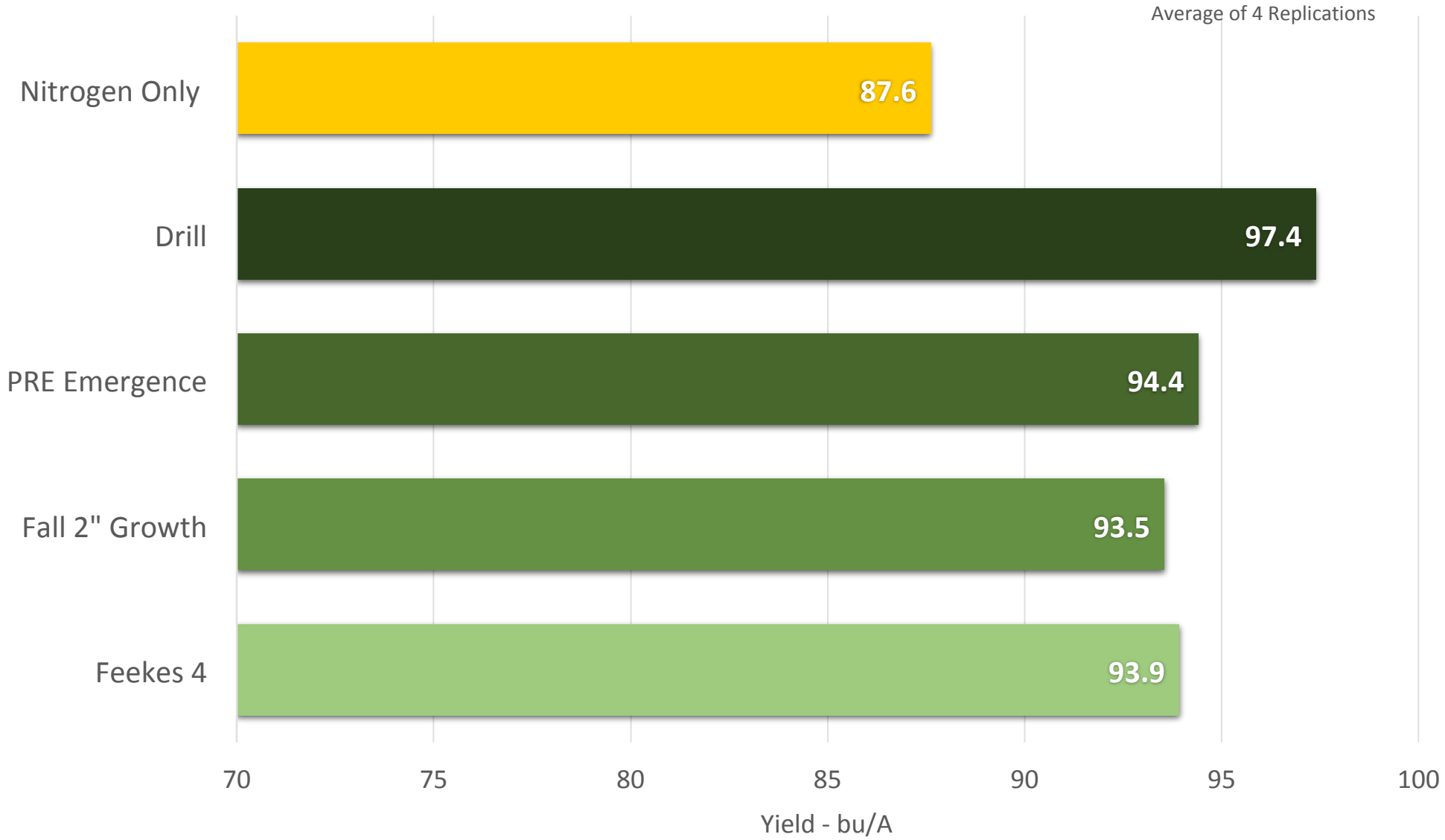
Winter Wheat Fertilizer Method of Application Comparison

North Central Research Station - 2017



All treatments included: 4 gal Pro-Germ. + 2 qt Micro 500; 30 gal PrimAgro N (Feekes 4)

17-707

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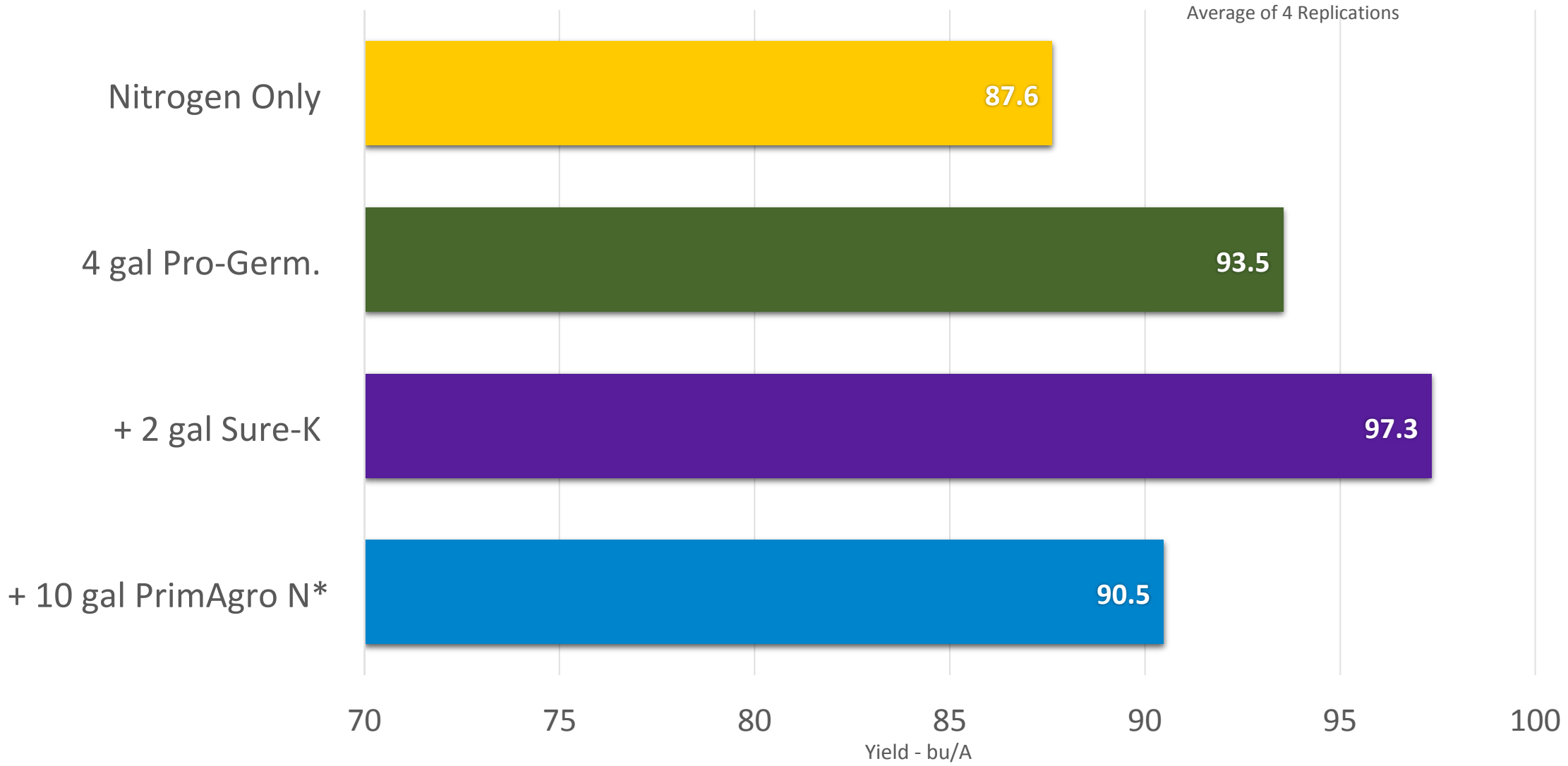
Fall Fertilizer Program Additives on Winter Wheat

North Central Research Station - 2017



All treatments topdressed with 30 gal PRIMAGRO N (Feekes 4)
*Topdress rate reduced to 20 gal

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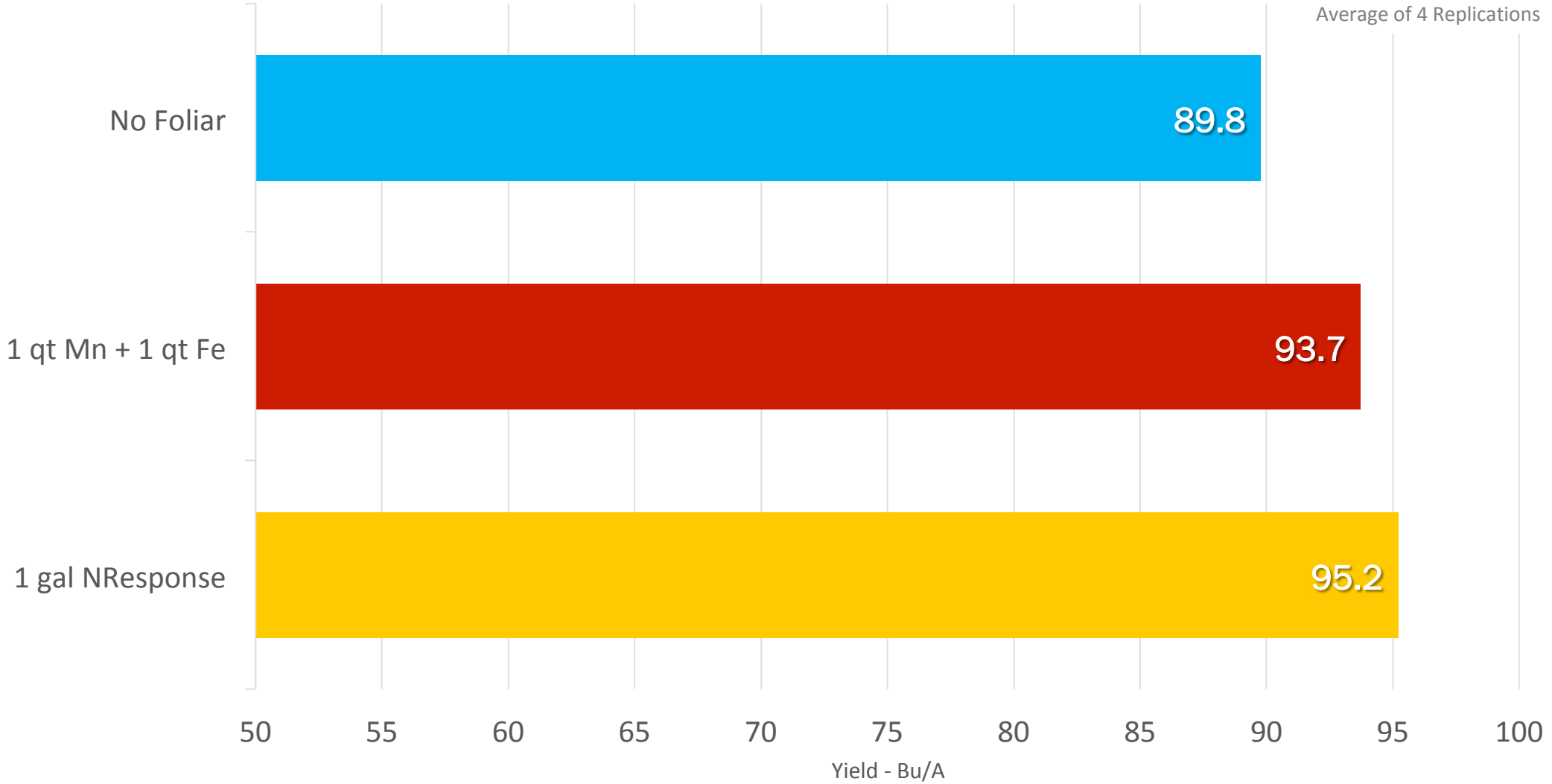
Late Foliar Applications on Winter Wheat

North Central Research Station - 2015



CEC: 10.3 pH: 7 OM: 2.1%

All treatments received Pro-Germ. + Sure-K + Micro 500 (Drill) 28 gal High NRG-N (TD)

Foliar applications made at flowering

15-903

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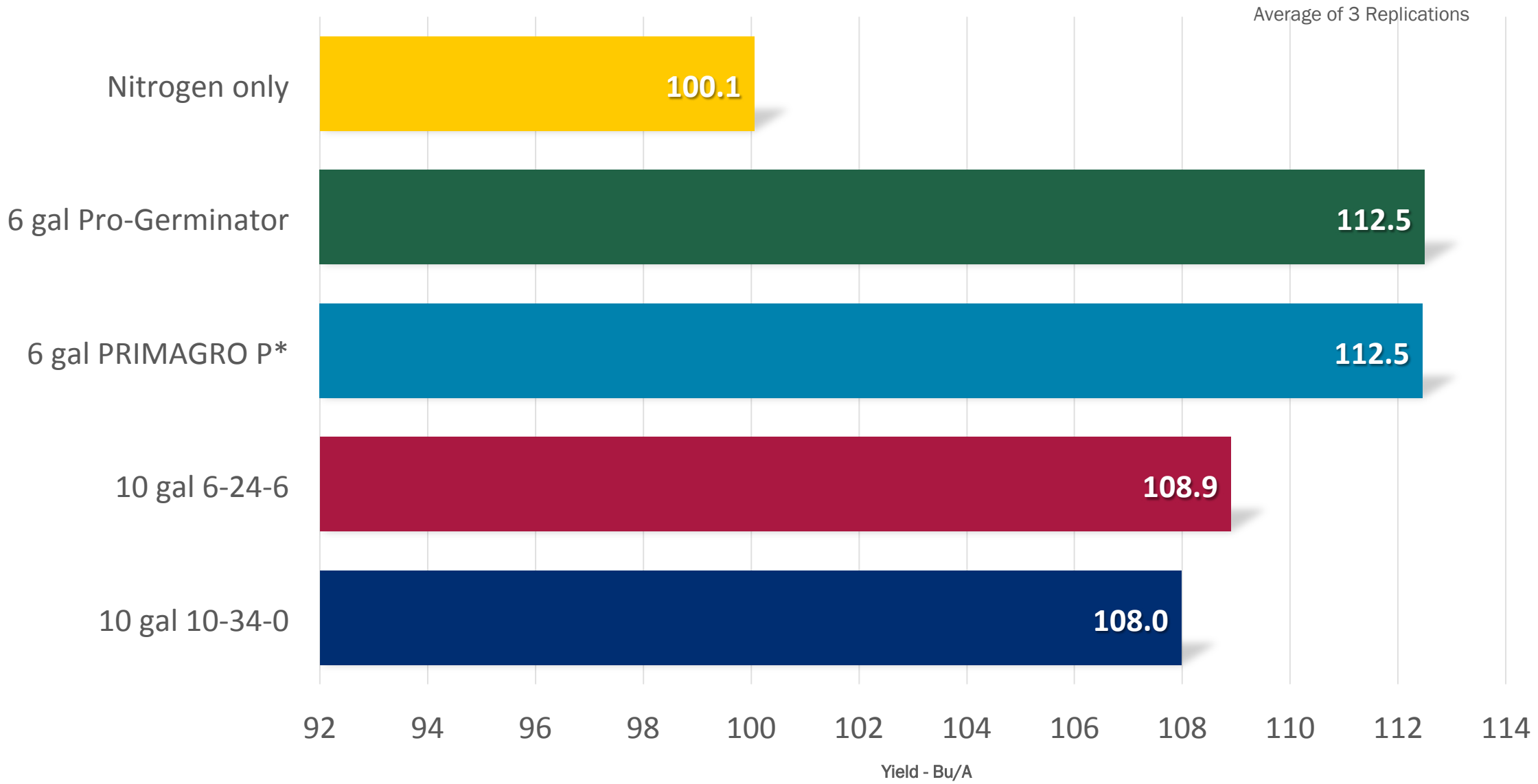
Phosphorus Source and Rate Comparison on Winter Wheat

North Central Research Station - 2016



All treatments included: Topdressed with 30 gal High NRG-N.
*without biological components

16-706

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Foliar N products with Fungicide

Brian Waugh, SAM

Location – Oakley Ks

Cooperator – Terry Hockersmith

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Testing Facts

- Sprayed with 4-Wheeler sprayer
  - Not the best application equipment
  - Too large of droplet size compared to an airplane
  - Sprayed at 20 psi
- Fungicide – Quilt @ 14 oz / acre
- Sprayed 4/21/2010 , 4:00 pm, 67 degrees
- Tried to replicate using speed and pressure
  - Therefore volume might have exceeded desired rates

NResponse– 2 gpa

XRN – 2 gpa

XRN – 2 gpa

ferti-Rain – 2 gpa

NResponse – 3 gpa

NResponse – 3 gpa

XRN – 3 gpa

Slightly more burn at 3 gpa, showed more than ferti-Rain but slightly less than NResponse

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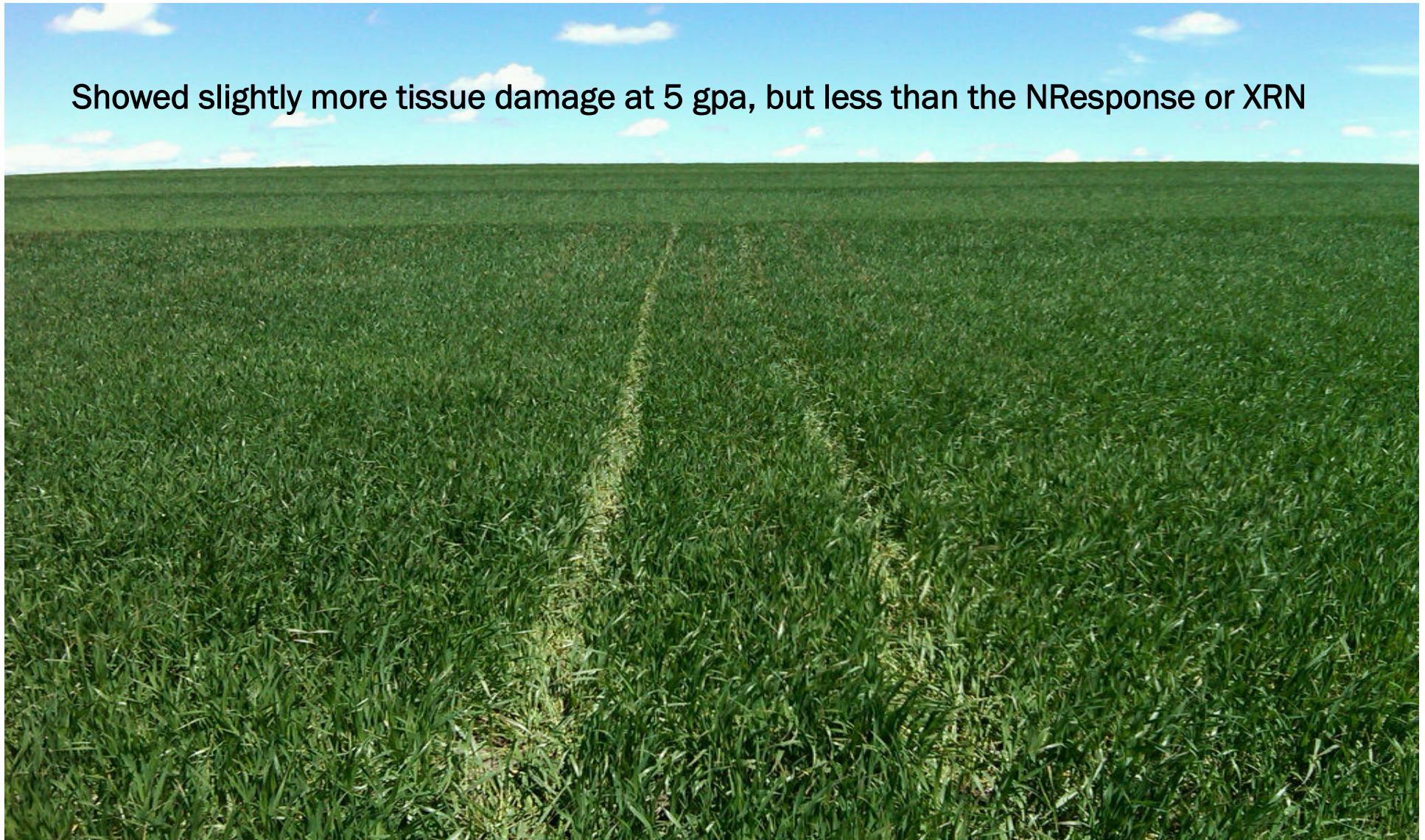
ferti-Rain – 3 gpa

NResponse– 5 gpa

XRN – 5 gpa

ferti-Rain – 5 gpa



Conclusion

- ferti-Rain had the least amount of tissue damage. Had to go to 5 gpa rate with strait product before any damage was noted.
  - Questioned mix ability with the fungicide as strait product
- NResponse showed the same tissue damage as XRN at the 2 gpa rate, but slightly more damage than XRN at the 3 and 5 gpa rate.
- I believe at the lower rate (2gpa) very little damage would be expected, recommendations would be to add at least 1 gpa water for application.