Evaluation of Late Season Application of Foliar Nitrogen's Impact on Grain Yield and Milling Qualities

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Background

- Woolfolk et al 2002.
  - UAN applied at Pre and Post Anthesis significantly increased protein.
    - Rates of 10,20,30,40
    - Best was Post at 30
- Recent work with Low Salt N at flag leaf showed inconsistent results. www.npk.okstate.edu
- Plains Grains Inc. Expressed interest in more in-depth work due to Low Pro values of 2010 Harvest.

Objectives

- Evaluate the use of UAN and specialty product for foliar N applied at flag leaf and post-flowering to improve winter wheat grain yield, protein, and milling and baking characteristics.

Materials & Methods

- Lahoma
  - (Grant Silt Loam – fine-silty, mixed, superactive, thermic Udic Agriustoll)
- Lake Carl Blackwell (LCB)
  - (Port Silt Loam –fine-silty, mixed, superactive, thermic Cumulic Haplustoll)
- 40 lbs N ac^{-1} preplant
- 40 lbs N ac^{-1} topdress at hollow stem

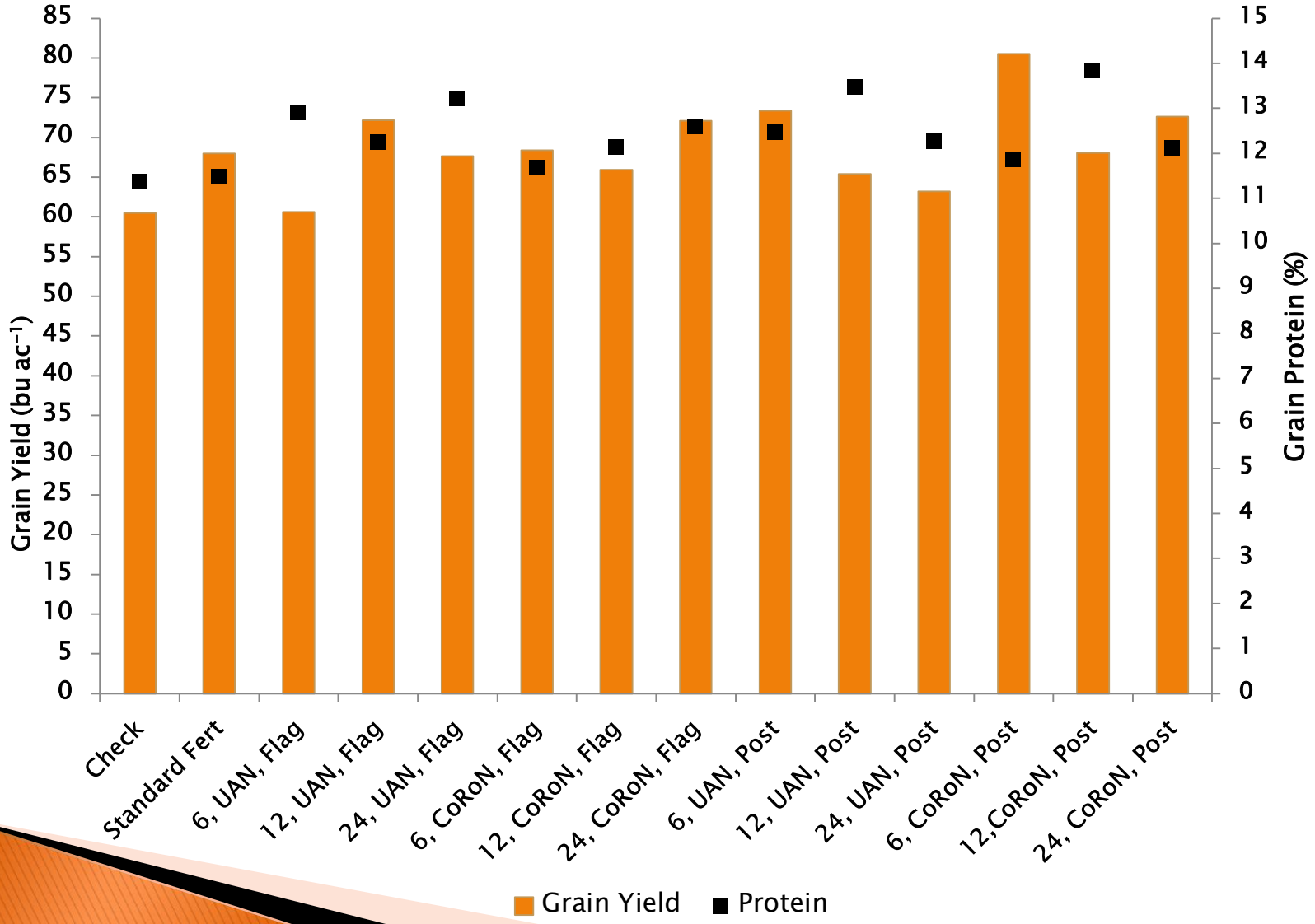
Materials and Methods

- Foliar applications- flag leaf & post-anthesis
- Foliar Sources
  - UAN (28-0-0)
  - CoRoN derived from urea, methylene diurea and methylene ureas (25-0-0)
- CO_2 backpack sprayer with offset boom
- 10 gallon ac^{-1} flow; Water added as carrier

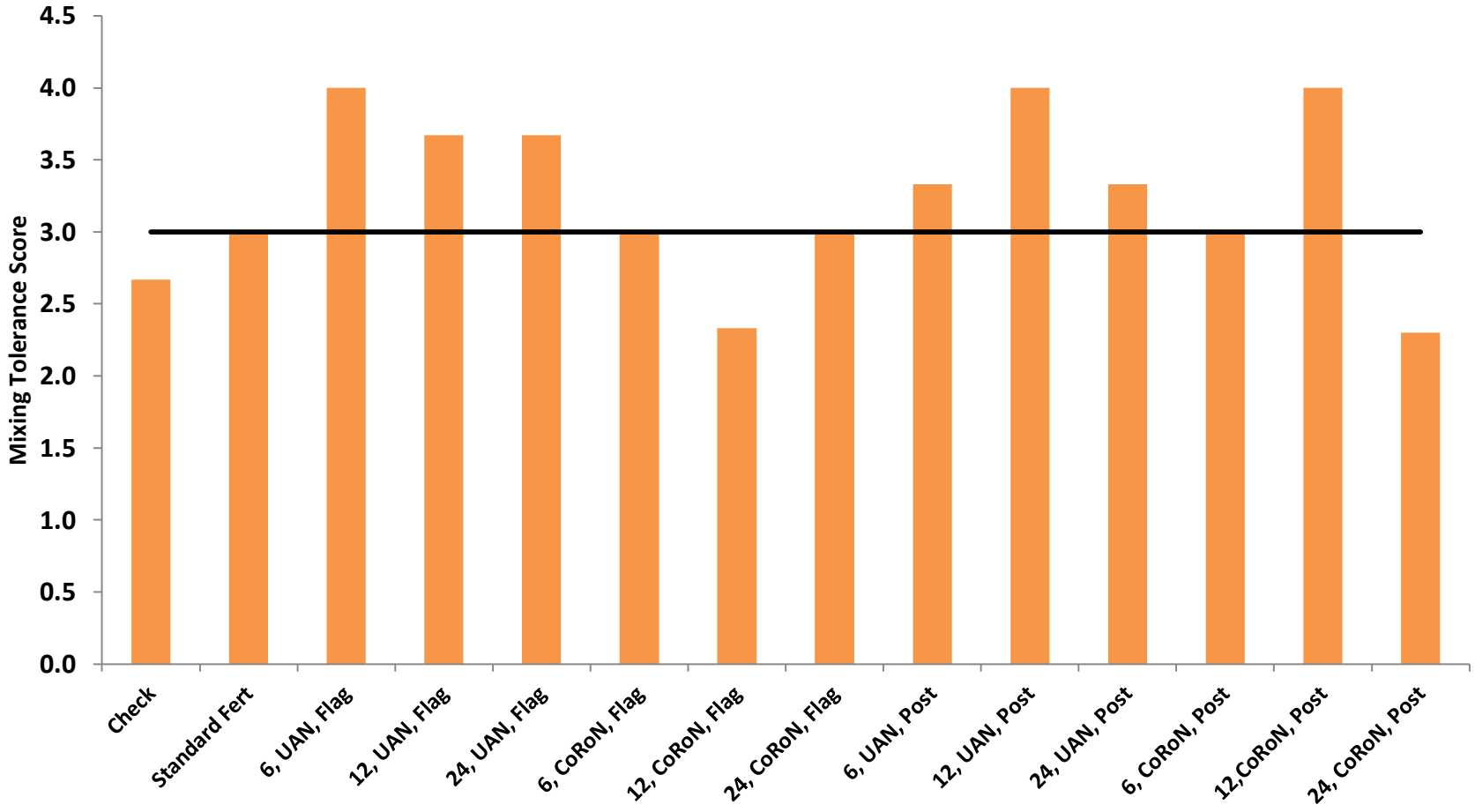
Treatments

Rate (lb N ac)	Source	Timing
Check		
Recommended Standard Fertility		
6	UAN	Flag Leaf
12	UAN	Flag Leaf
24	UAN	Flag Leaf
6	CoRoN	Flag Leaf
12	CoRoN	Flag Leaf
24	CoRoN	Flag Leaf
6	UAN	Post Anthesis
12	UAN	Post Anthesis
24	UAN	Post Anthesis
6	CoRoN	Post Anthesis
12	CoRoN	Post Anthesis
24	CoRoN	Post Anthesis

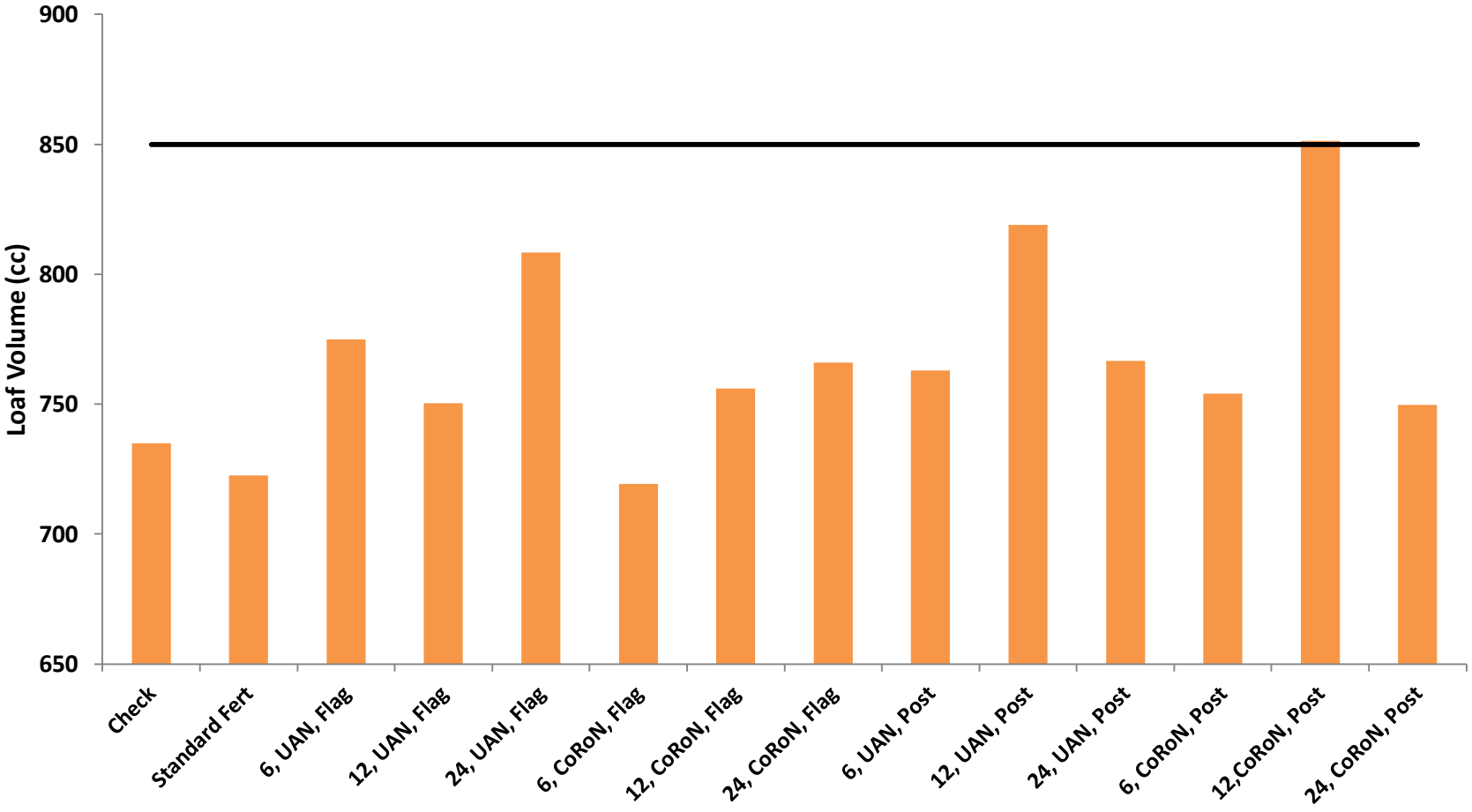
Grain yield and protein, Lahoma



Mixing Tolerance, Lahoma



Loaf Volume, Lahoma

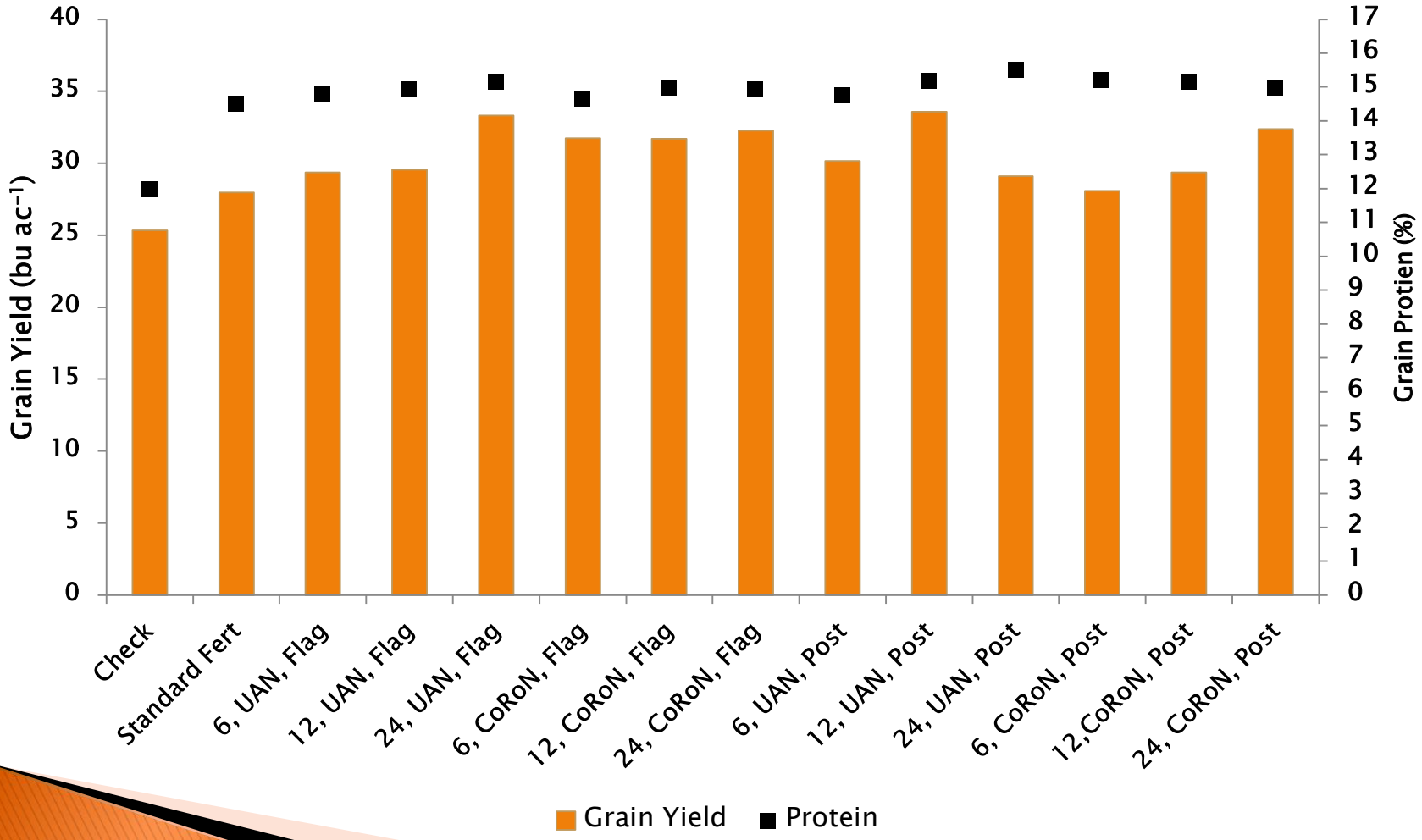


Summary Table, Lahoma

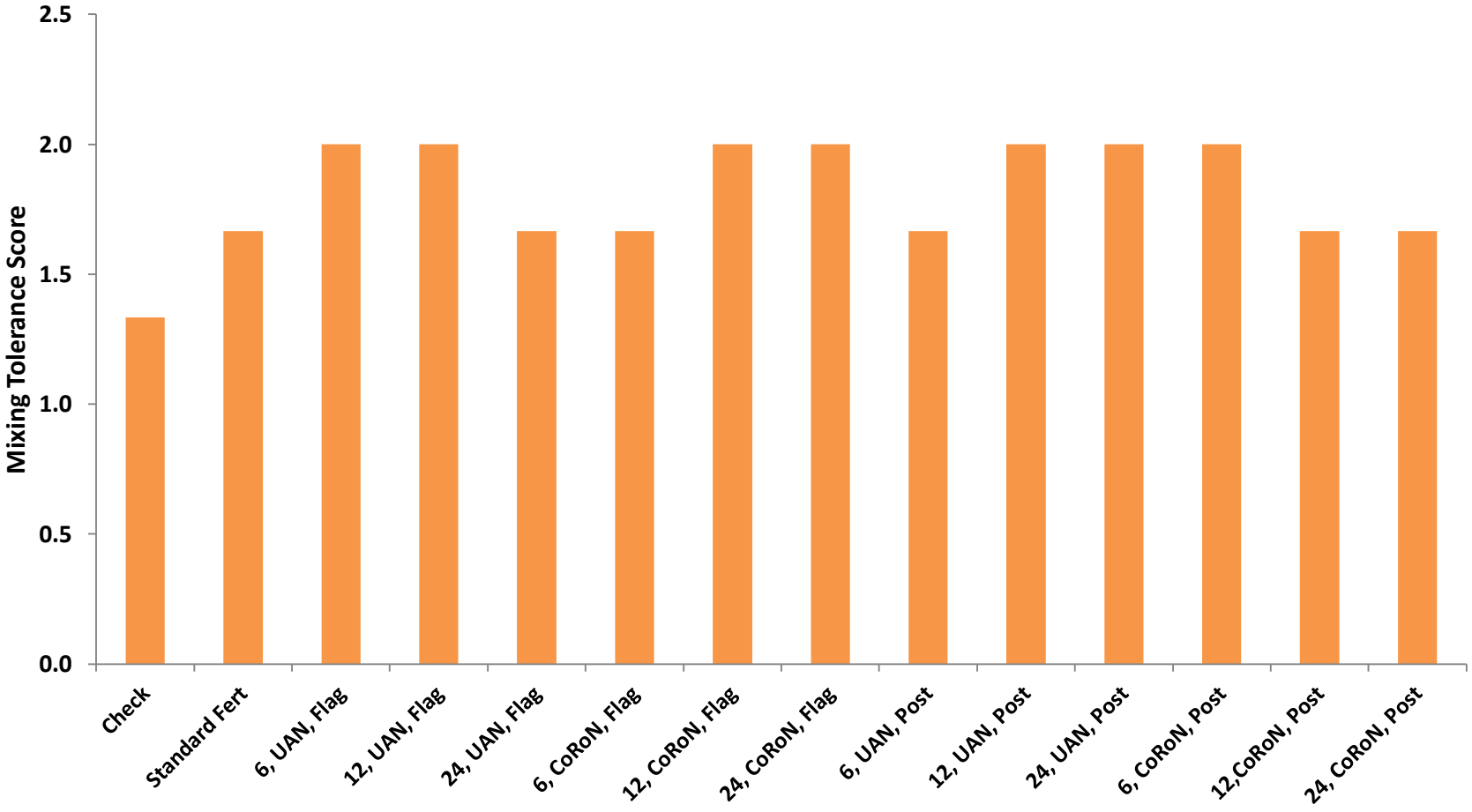
Variable	Rate	Source	Time	Rate*Source	Rate*Time	Source*Time	Rate*Source*Time
Grain Yield	NS	NS	NS	NS	NS	NS	NS
Protein	NS	NS	NS	NS	*	NS	NS
Mix Tolerance	NS	***	NS	NS	***	NS	NS
Loaf Volume	NS	NS	NS	NS	NS	NS	NS

*,**, *** – significant at the 0.1, 0.05, 0.01% level, respectively

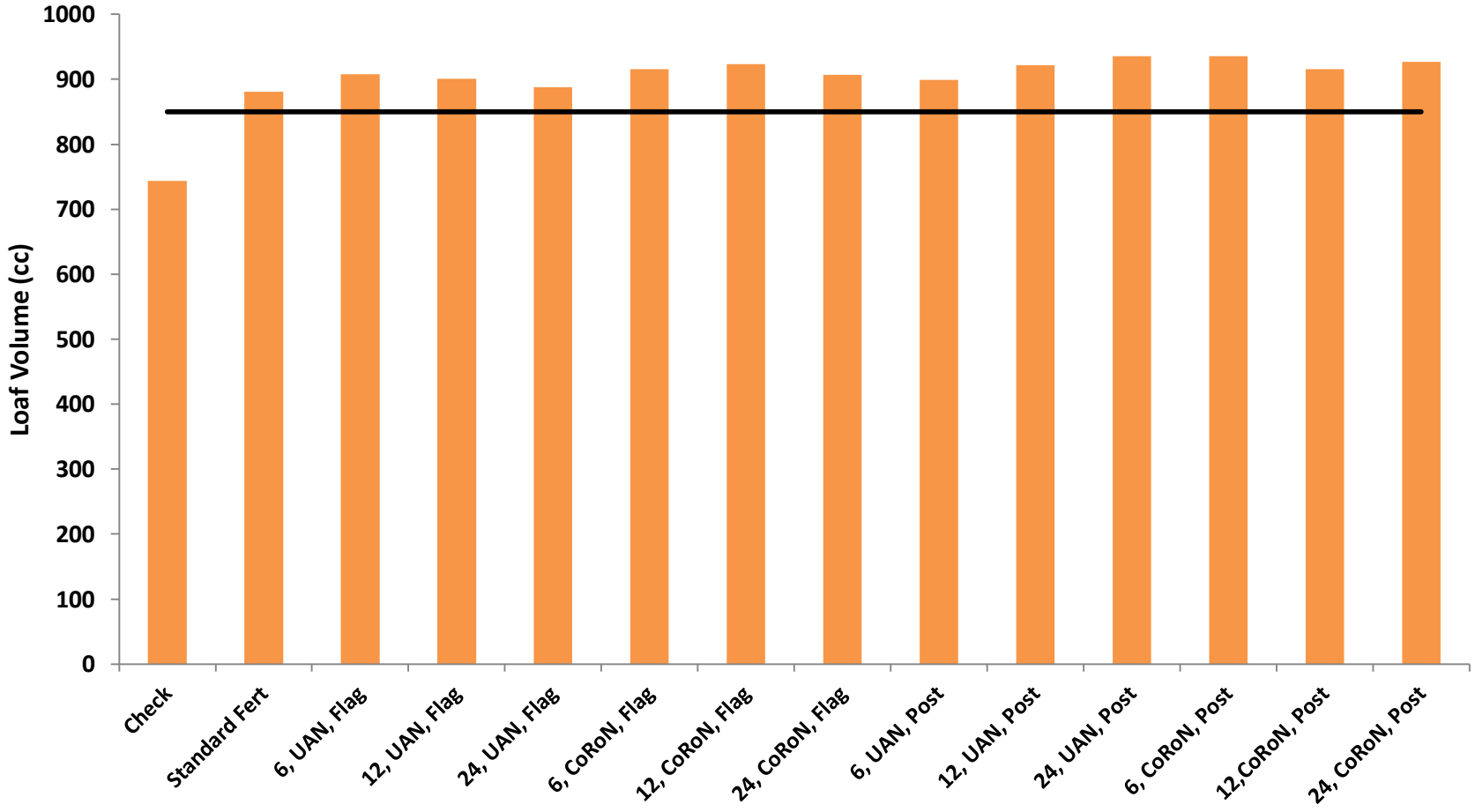
Grain yield and protein, LCB



Mixing Tolerance, LCB

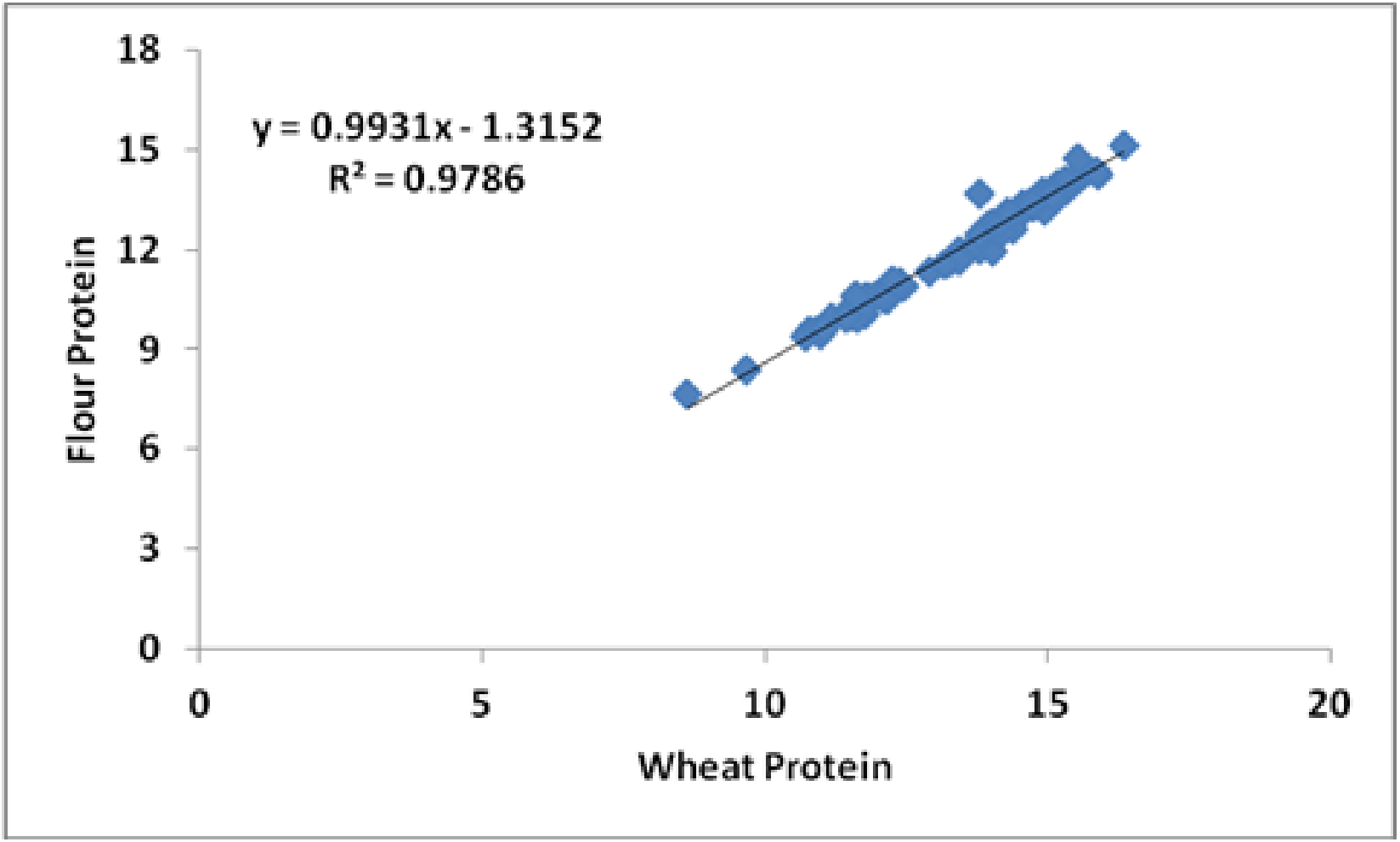


Loaf Volume, LCB



Summary Table, LCB

Variable	Rate	Source	Time	Rate*Source	Rate*Time	Source*Time	Rate*Source*Time
Grain Yield	NS	NS	NS	NS	NS	NS	NS
Protein	NS	NS	NS	NS	NS	NS	NS
Mix Tolerance	NS	NS	NS	NS	NS	NS	NS
Loaf Volume	NS	NS	NS	NS	NS	NS	NS


y = 0.9931x - 1.3152
R² = 0.9786
Flour Protein
Wheat Protein
18
15
12
9
6
3
0
0
5
10
15
20

Lahoma Results

- No significance in grain yield, protein, and loaf volume
- 12 lb N post-anthesis – highest protein
- UAN treatments – significantly higher mixing tolerance

LCB Results

- No main effects or interactions significant
- LCB – 3% protein increase over check
- 1% increase over standard fertility with 24 lbs UAN post-anthesis
- All mixing tolerance below quality target
- All foliar treatments larger loaf volume than standard fertility
  - Late application increased volume by 55cc

Conclusions

- Both Locations – no trend in yield developed
  - Environment
- Foliar N – potential increase in Protein and loaf volume even at lower N levels.
- 1year data – no final conclusions can be made
  - Further evaluation

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- FFF

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