

EVERY BUSHEL HARVESTED  
HAS A CONSUMER ENJOYED STORY

# U of M Volatilization Research



[www.taurus.ag](http://www.taurus.ag)



# Our Portfolio

Whatever conditions your Urea or UAN applications might be challenged with we have you covered. From the Low Risk, Low Cost Peace of Mind to the Complete Agronomic High Loss Situations.



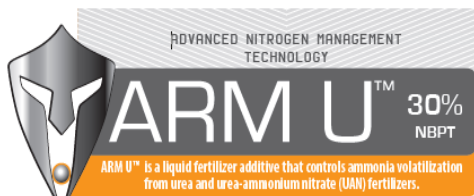
- Active STABILIZER™ PLUS a Dual Action that offers superior efficacy and no bio-accumulation. With its low cost and unique variable application rate, farmers can treat as necessary to maximize their return on investment.



– the best handling product on the market for volatilization losses. Research and product book online <file:///C:/Users/Owner/Downloads/ArmU-ADVANCED-booklet-2020-WEB.pdf>



- 2 part product that provides Dual-action nitrogen saving technology that inhibits both ammonia volatilization and nitrification.



- 30% NPBT Formula.



# Research Conducted by Dr. Francis Zvomuya and Dr. Theresa Adesanya-University of Manitoba

## Study Conducted

- Volatilization Study on Nitrogen fertilizers
- Using Different Products
- Applying a Different Rates
- Broadcast and Banded Application Methods
- Data from UOM 14 day Ammonia Volatilization Study.
- UREA – Banded and Broadcast
- UAN – Dribble Banded
- 11 different Trials per Application
- Total N Applied: **120kg of N/ha = 107 lbs of N/acre**
- **RESULT is to determine if N management products have a Diminishing ROI based on rate, application method and product ingredients.**

# Soil Analysis and Application Rate

- A 14-day growth room study was conducted utilizing soils from a farm in Roseisle, MB
- **Experimental design:** Completely Randomized Design (CRD)
  - 4 replicates
  - 5 sampling times at Day 1, 2, 4, 7 and 14

## UREA/UAN (Application rate: 107 LBs of N/Ac)

Soil property	Values
Soil pH	7.9 ± 0.09
Electrical conductivity (ds m <sup>-1</sup> )	0.28 ± 0.02
Field capacity (g kg <sup>-1</sup> )	260.0
Organic matter (%)	2.4 ± 0.1
CEC (meq/100g)	11.3 ± 0.4
Soil type	Sand
Sand %	89.3 ± 0.9
Silt %	7.3 ± 0.9
Clay %	3.4 ± 0
N (mg kg <sup>-1</sup> )	15.7 ± 0.5
P (mg kg <sup>-1</sup> )	23.3 ± 0.5
K (mg kg <sup>-1</sup> )	213.3 ± 18
S (mg kg <sup>-1</sup> )	5 ± 0.8
Ca (mg kg <sup>-1</sup> )	1767 ± 47
Mg (mg kg <sup>-1</sup> )	223 ± 12
Na (mg kg <sup>-1</sup> )	11.3 ± 0.9

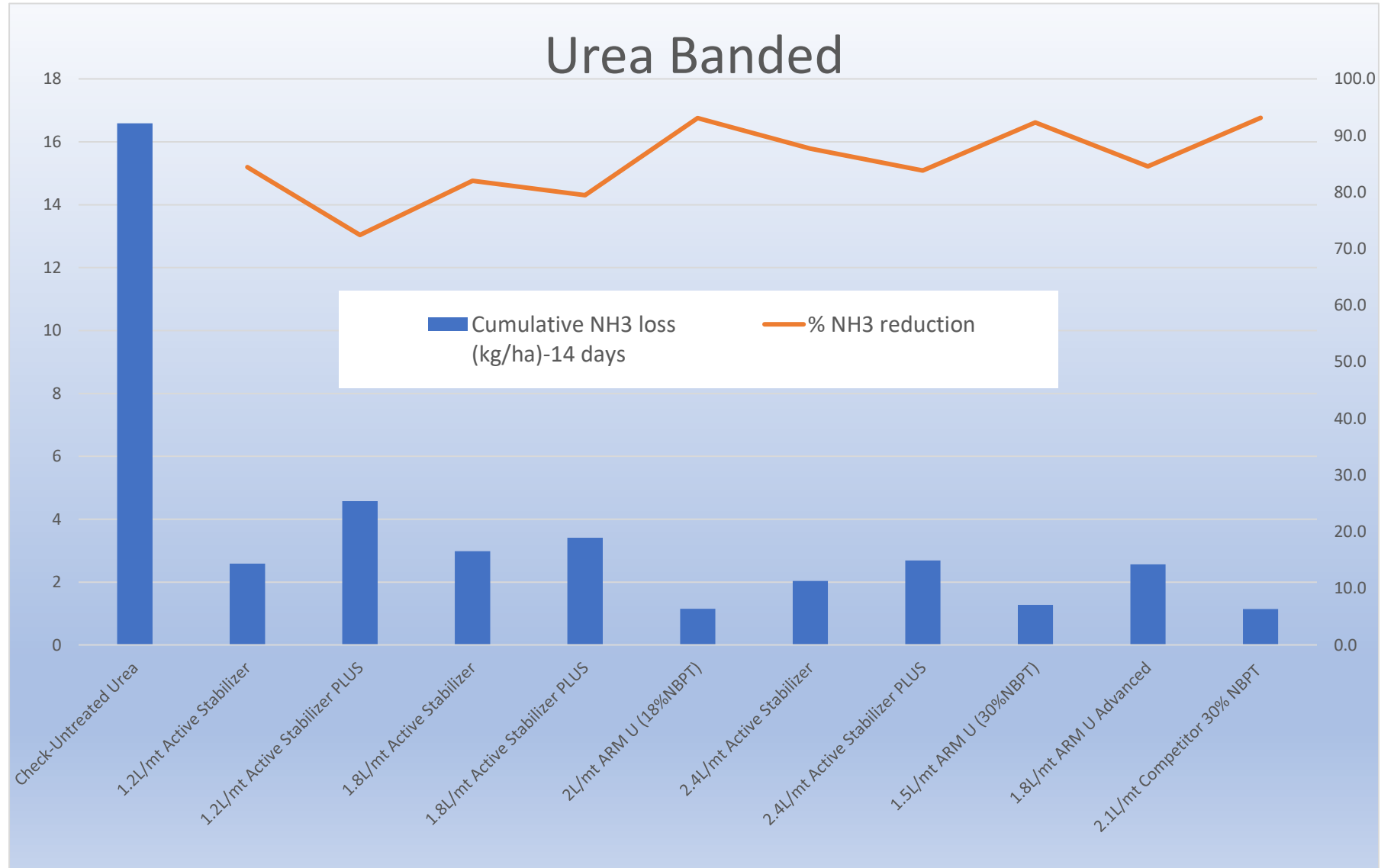


# RAW DATA UREA

UREA Treatment	Banded		Broadcast	
	Cumulative NH3 loss (kg/ha)-14 days	% NH3 reduction	Cumulative NH3 loss (kg/ha)	% NH3 reduction
Check-Untreated Urea	16.5877		19.1712	
1.2L/mt Active Stabilizer	2.5827	84.4	3.9204	79.6
1.2L/mt Active Stabilizer PLUS	4.5699	72.5	7.3834	61.5
1.8L/mt Active Stabilizer	2.9813	82.0	6.2113	67.6
1.8L/mt Active Stabilizer PLUS	3.4101	79.4	4.7511	75.2
2L/mt ARM U (18%NBPT)	1.1475	93.1	3.3687	82.4
2.4L/mt Active Stabilizer	2.0377	87.7	2.4178	87.4
2.4L/mt Active Stabilizer PLUS	2.6868	83.8	5.6927	70.3
1.5L/mt ARM U 30 (30%NBPT)	1.2734	92.3	2.3781	87.6
1.8L/mt ARM U Advanced	2.5644	84.5	4.5	76.5
2.1L/mt Competitor (30% NBPT)	1.1419	93.1	2.6501	86.2

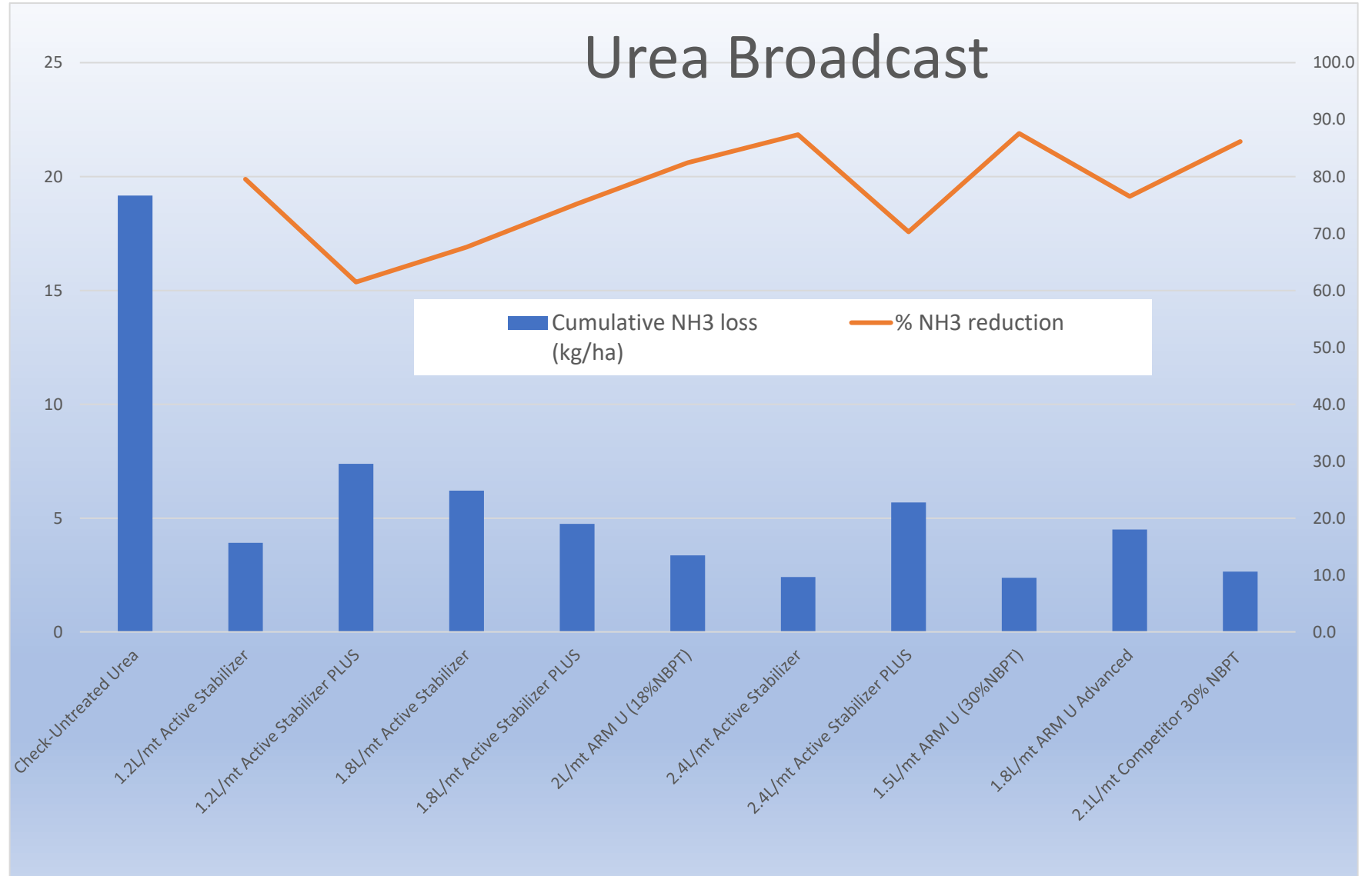


# Urea Banded NH3 loss & Treatment % Reduction





# Urea Broadcast NH3 loss & Treatment % Reduction





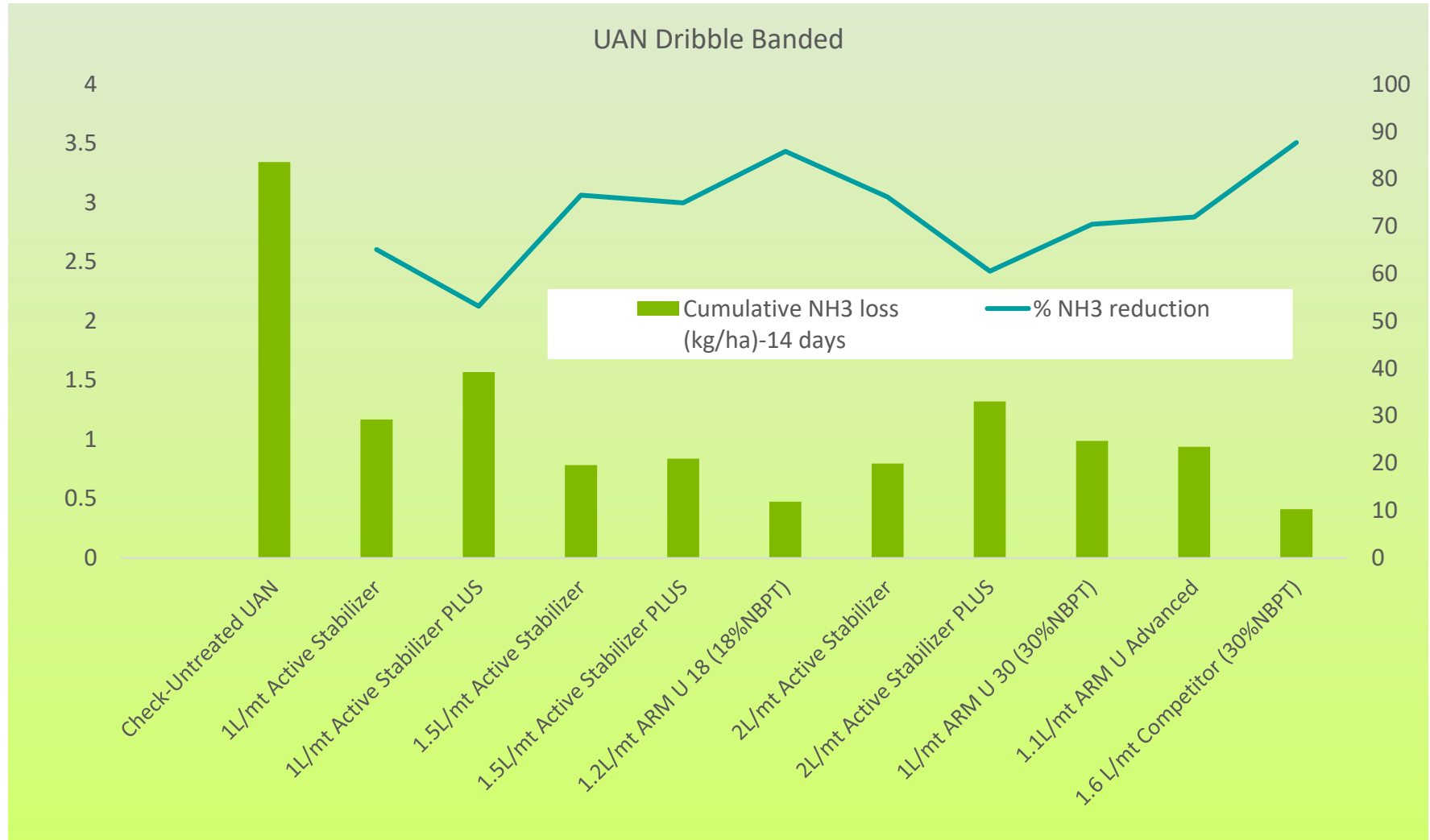
# RAW DATA UAN

UAN	Dribble Banded		Broadcast	
Treatment	Cumulative NH3 loss (kg/ha)-14 days	% NH3 reduction	Cumulative NH3 loss (kg/ha)	% NH3 reduction
Check-Untreated UAN	3.3436		2.7889	
1L/mt Active Stabilizer	1.1671	65.1	2.2398	19.7
1L/mt Active Stabilizer PLUS	1.5679	53.1	2.1273	23.7
1.5L/mt Active Stabilizer	0.7834	76.6	1.3877	50.2
1.5L/mt Active Stabilizer PLUS	0.8371	75.0	2.7346	1.9
1.2L/mt ARM U (18%NBPT)	0.4738	85.8	1.6821	39.7
2L/mt Active Stabilizer	0.7965	76.2	1.5776	43.4
2L/mt Active Stabilizer PLUS	1.3209	60.5	2.6173	6.2
1L/mt ARM U 30 30 (30%NBPT)	0.9886	70.4	1.6347	41.4
1.1L/mt ARM U Advanced	0.9379	71.9	2.0785	25.5
1.6L/mt Competitor (30%NBPT)	0.4117	87.7	0.6225	77.7





# UAN Dribble Banded NH3 loss & Treatment % Reduction





## Residual soil N concentration

Treatment	Ammonium N (mg kg <sup>-1</sup> )		Nitrate- N (mg kg <sup>-1</sup> )	
	UAN	Urea	UAN	Urea
<b>Control</b>	4.2	4.2	31.4	31.4c
<b>1 AS</b>	10.36	13.30	144.5	155.38 ab
<b>1 ASP</b>	15.88	9.67	164.25	154.25 ab
<b>1.5 AS</b>	10.55	9.81	152.25	178.5 a
<b>1.5 ASP</b>	15.33	12.27	150.62	172.75 a
<b>18% ARM U</b>	8.81	9.77	147.75	133.25 ab
<b>2 AS</b>	9.59	10.06	151	146.5 ab
<b>2 ASP</b>	16.11	11.91	141.5	135.6 ab
<b>30% ARM U</b>	12.89	10.43	<b>180.25</b>	<b>176.5a</b>
<b>ARM U Advanced</b>	<b>16.88</b>	12.51	153.37	143.5ab
<b>Check-untreated</b>	13.04	<b>14.47</b>	137.62	109.69b
<b>Competitor 30%</b>	16.23	8.37	146.25	163.5a



# Conclusions

- Volatilization losses were greater on Urea vs UAN
- Volatilization on Urea in banded or broadcast are both significant. Both 15% or greater
- Shallow banding of urea and UAN in combination with urease and nitrification inhibitors significantly reduced ammonia volatilization
- Volatilization losses in UAN were not as significant but UAN is only a portion in Urea base and is a good candidate for Dual action Nitrogen management like Stabilizer plus and ARM U Advanced to stabilize the nitrate base.
- For urea, the performance of 18% ARM U, and 2.4 AS was comparable to Competitor despite their lower concentration of NBPT per kg of fertilizer
- ARM U 30 appears to have the same performance to competitor at a lower rate
- Product Quality is extremely important
- Total Residual Soil N in All treatments is higher than Check
- In All treatments greatest losses occurred within the 1<sup>st</sup> 5 days