ACTIVE™ AgriScience

ACTIVEAGRISCIENCE.COM

TECHNOLOGY BEYOND the POINT of NUTRITION™

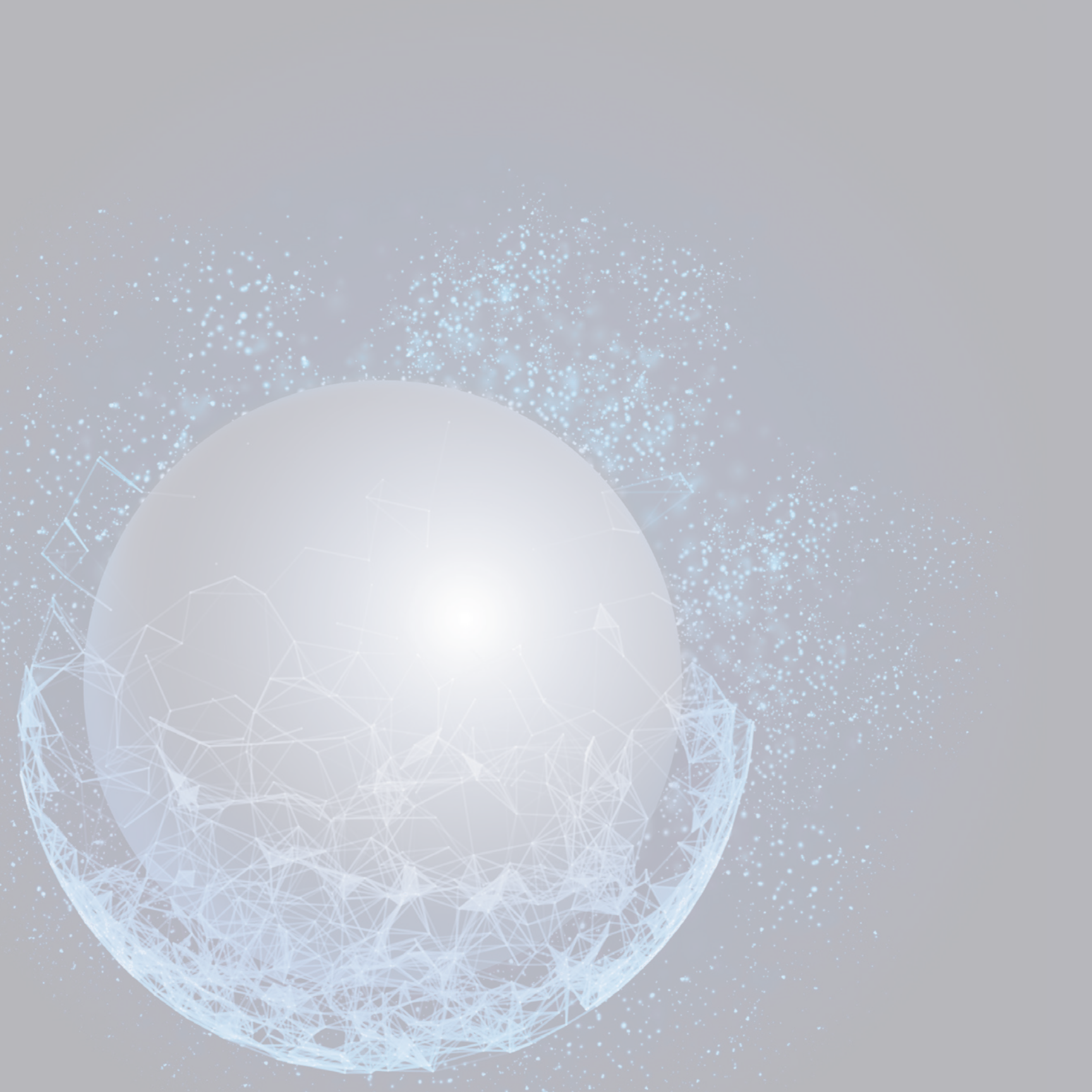
PRODUCT GUIDE

NITROGEN STABILIZERS

ECONOMICAL

FLEXIBLE

SUSTAINABLE



Special thanks to our

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TECHNOLOGY BEYOND THE POINT OF NUTRITION™

Active AgriScience Inc. supports the farming community by providing innovative, effective and economical products. A leader in plant nutrient and bioactive compound research and technology, Active AgriScience uses rigorous scientific methods to develop full cycle fertilizer and nitrogen management solutions to help enhance crop potential while being mindful of environmental impacts.

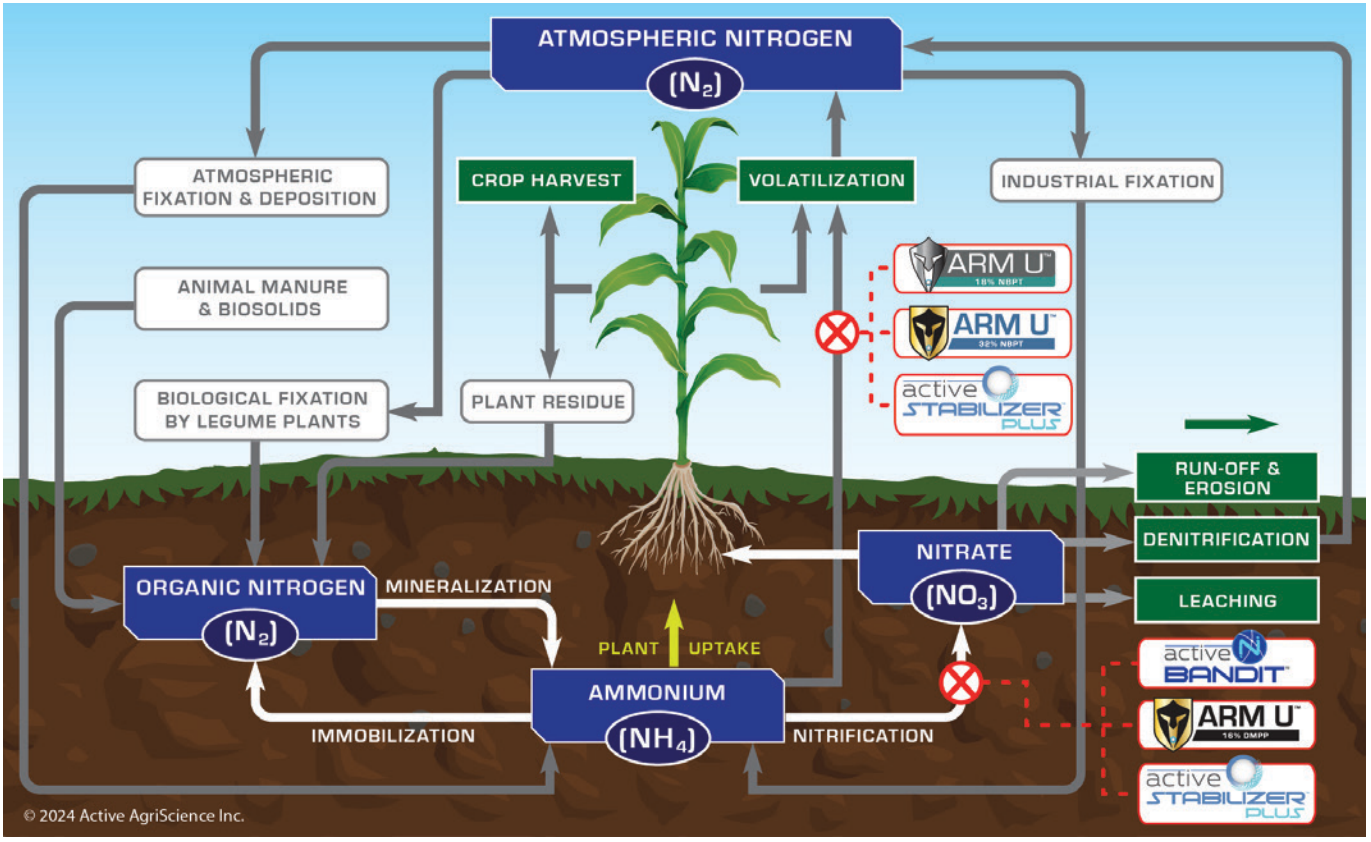
Nitrogen is essential for plant life and growth and is therefore a component of many fertilizers. Nitrogen loss is a challenge facing every grower when applying Urea or UAN in the spring or fall, regardless of the application method.

The risk of this nitrogen loss varies with:

- the type of nitrogen
- soil type
- temperature
- management practices

Without any protective coating up to 50% of soil-applied nitrogen is unavailable to the plant. Nitrogen can be converted quickly into ammonia gas through the process of ammonia volatilization and then released into the atmosphere. Nitrogen can also be lost in the soil through nitrification, the process of converting ammonium ions to less stable nitrate ions. Both of these mechanisms play a substantial role in the loss of valuable nitrogen.

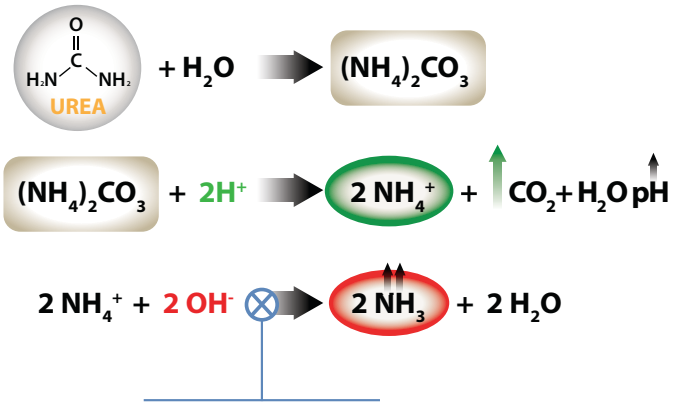
Understanding the nitrogen cycle and the factors that can result in nitrogen loss are crucial to finding the right solution to this problem



Volatilization and nitrification are two processes that are responsible for nitrogen loss.

VOLATILIZATION

Ammonia volatilization occurs during the hydrolysis of urea and is governed by the urease enzyme.

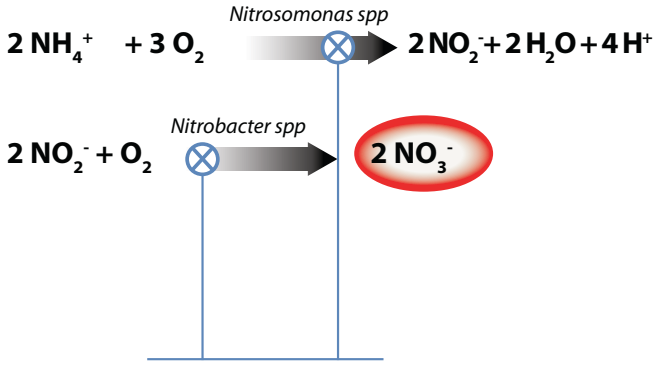


Coating urea with
ARM U™ 18% NBPT
ARM U™ 30% NBPT
Active STABILIZER™ PLUS

reduces ammonia volatilization by inhibiting urease enzyme activity.

NITRIFICATION

Nitrate is formed by the oxidation of ammonium in the presence of *Nitrosomonas* & *Nitrobacter* bacteria.

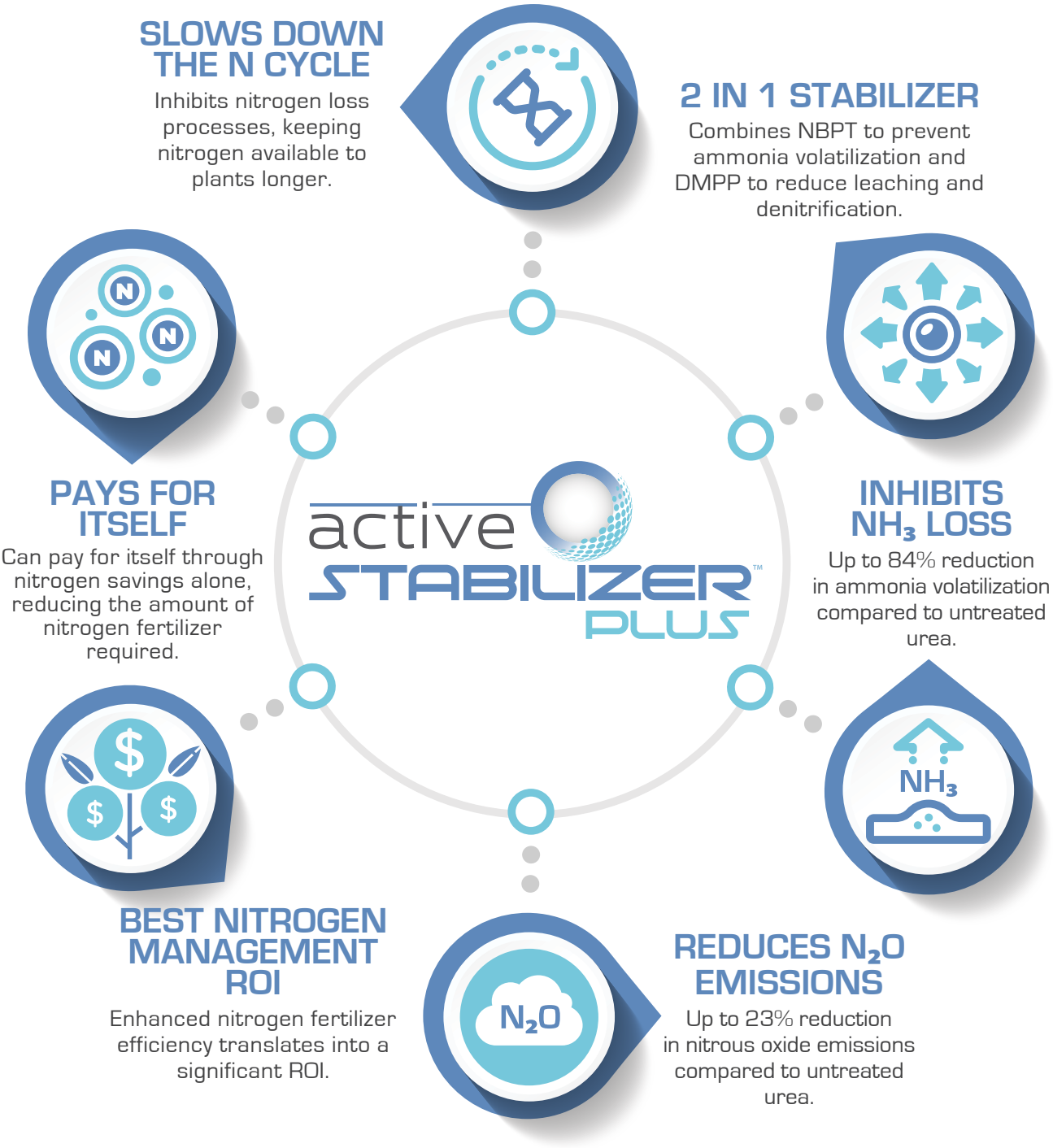


Coating urea with
ARM U™ 15% DMPP
ACTIVE BANDIT™
ACTIVE STABILIZER™ PLUS

inhibits nitrification by inhibiting *Nitrosomonas* and *Nitrobacter* bacterial activity.

PRODUCT COMPARISON

Active STABILIZER PLUS	ARM U 18% NBPT	ARM U 30% NBPT	ARM U 15% DMPP	Active BANDIT
12% NBPT	18% NBPT	30% NBPT	No NBPT	No NBPT
2% DMPP	No DMPP	No DMPP	15% DMPP	10% DMPP
1.2 - 2.4 L / t of urea	2 L / t of urea	1.2 L / t of urea	1.8 L / t of urea	0.8 - 1 L / t of urea
Inhibits volatilization, leaching and denitrification	Inhibits ammonia volatilization	Inhibits ammonia volatilization	Inhibits leaching and denitrification	Inhibits leaching and denitrification
General purpose dual inhibitor for fall or spring	For high soil pH, low moisture	Stronger protection in low moisture conditions	For fall applications, water-logged soils	For banded applications


SLOWS DOWN THE N CYCLE
Inhibits nitrogen loss processes, keeping nitrogen available to plants longer.
2 IN 1 STABILIZER
Combines NBPT to prevent ammonia volatilization and DMPP to reduce leaching and denitrification.
PAYS FOR ITSELF
Can pay for itself through nitrogen savings alone, reducing the amount of nitrogen fertilizer required.
active STABILIZER™ PLUS
INHIBITS NH_3 LOSS
Up to 84% reduction in ammonia volatilization compared to untreated urea.
BEST NITROGEN MANAGEMENT ROI
Enhanced nitrogen fertilizer efficiency translates into a significant ROI.
REDUCES N_2O EMISSIONS
Up to 23% reduction in nitrous oxide emissions compared to untreated urea.

BEST INDUSTRY VOLATILIZATION PRODUCT

Leads the industry in preventing nitrogen loss via ammonia volatilization.

HIGHLY EFFICIENT

Requires less product per metric tonne of fertilizer compared to competitor brands.

CANADIAN MADE

Made in Canada and designed specifically for North American conditions.

ARM U™
18% NBPT

INHIBITS NH_3 LOSS

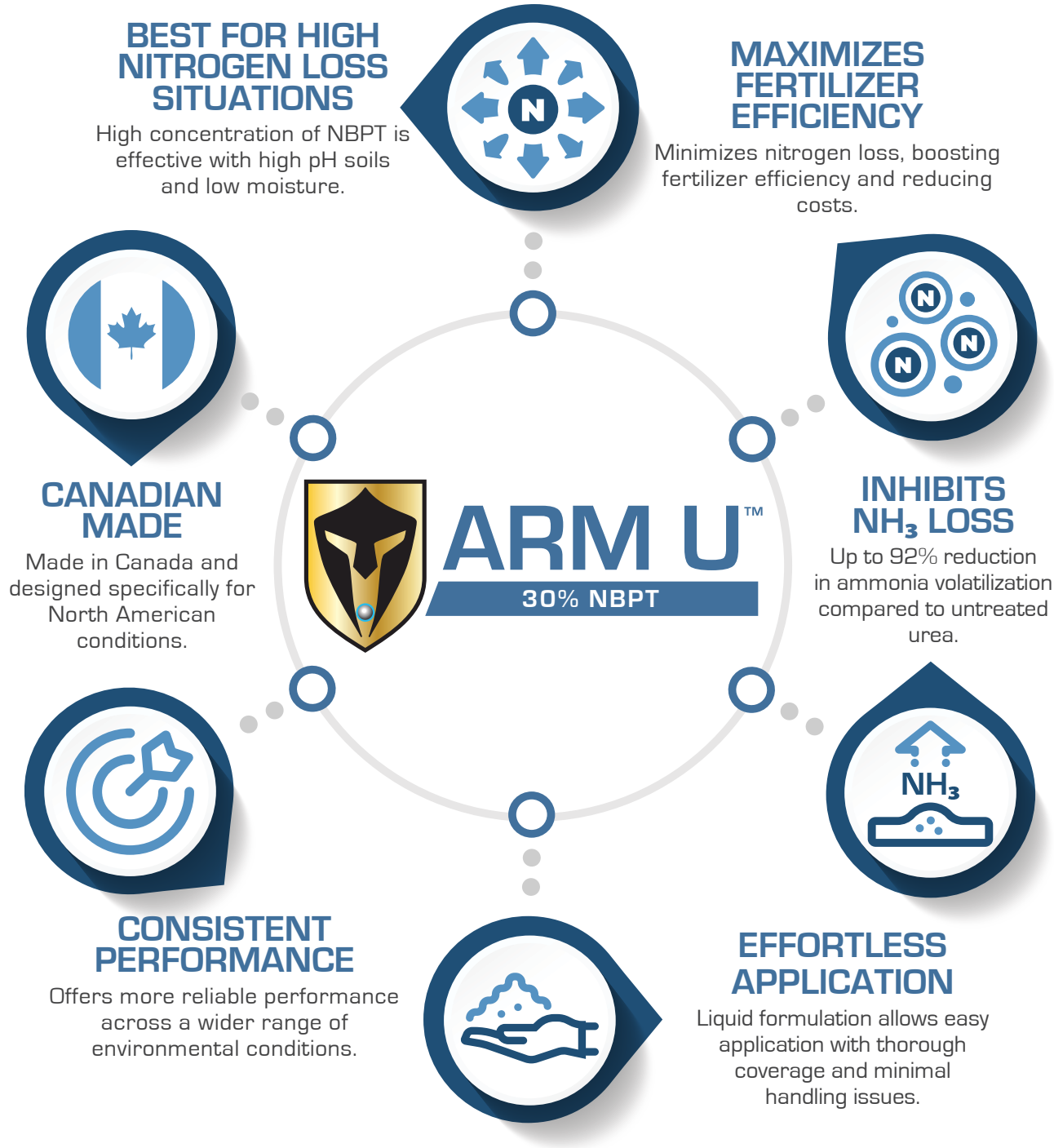
Up to 81% reduction in ammonia volatilization compared to untreated urea.

BEST NITROGEN MANAGEMENT ROI

Enhanced nitrogen fertilizer efficiency translates into a significant ROI.

GREAT HANDLING

Easy to store, mix, and apply, offering reliable performance under various environmental conditions.


BEST FOR HIGH NITROGEN LOSS SITUATIONS
High concentration of NBPT is effective with high pH soils and low moisture.
MAXIMIZES FERTILIZER EFFICIENCY
Minimizes nitrogen loss, boosting fertilizer efficiency and reducing costs.
CANADIAN MADE
Made in Canada and designed specifically for North American conditions.
ARM U™
30% NBPT
INHIBITS NH_3 LOSS
Up to 92% reduction in ammonia volatilization compared to untreated urea.
CONSISTENT PERFORMANCE
Offers more reliable performance across a wider range of environmental conditions.
EFFORTLESS APPLICATION
Liquid formulation allows easy application with thorough coverage and minimal handling issues.

SLOWS DOWN THE N CYCLE

Slows the conversion of ammonium to nitrate, enhancing the efficiency of nitrogen fertilizers.

IMPROVES NITROGEN-USE EFFICIENCY

Maximizes fertilizer efficiency, lowering overall costs by reducing the amount needed.

CANADIAN MADE

Made in Canada and designed specifically for North American conditions.

REDUCES N_2O EMISSIONS

DMPP inhibits nitrification which reduces nitrous oxide emissions.

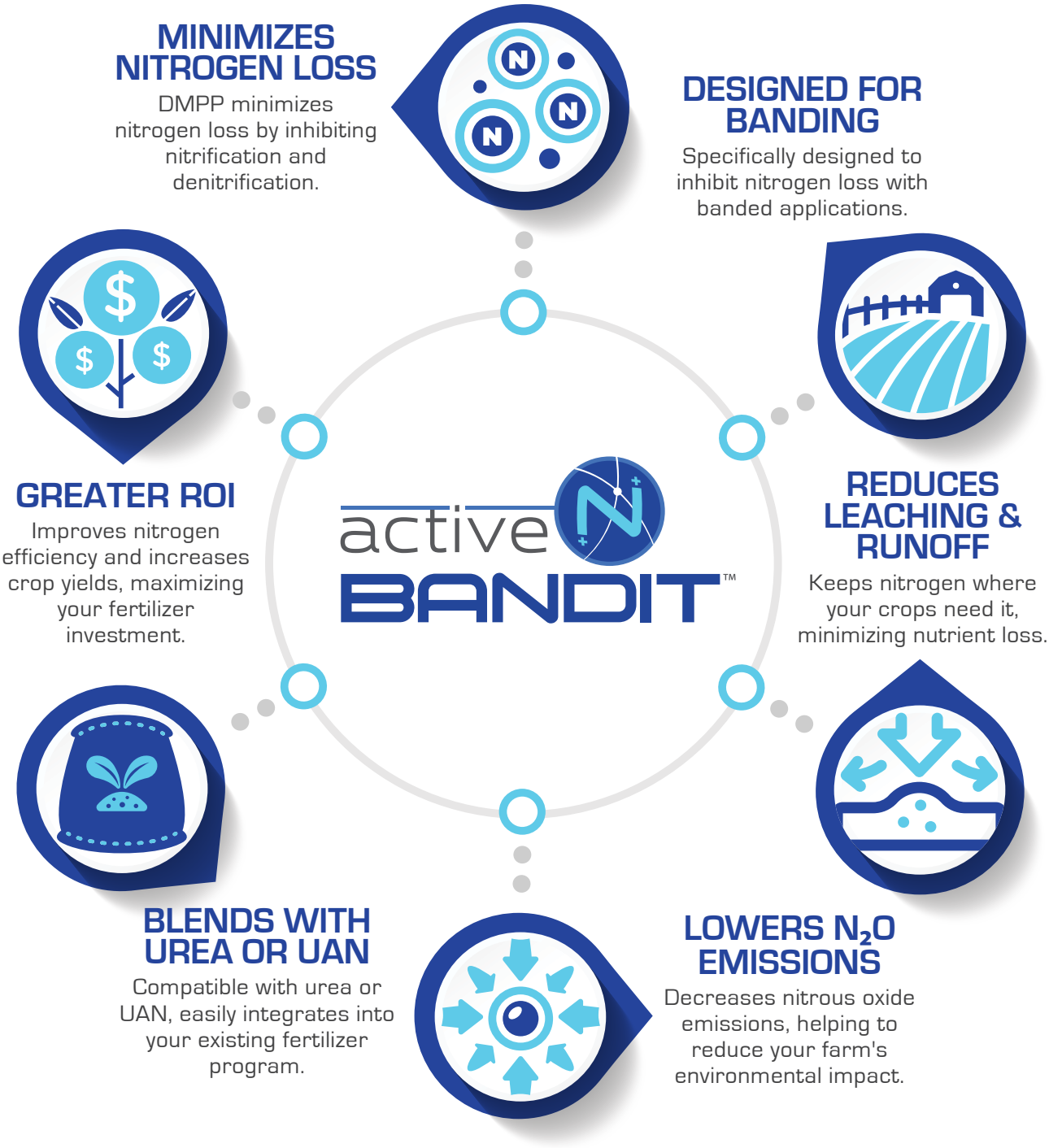
ARM U™
15% DMPP

LESS PRODUCT, MORE IMPACT

Requires less product per metric tonne of fertilizer compared to competitor brands.

ADD NBPT FOR DUAL PROTECTION

Can be mixed with ARM U™ 18% NBPT or 30% NBPT to inhibit all forms of nitrogen loss.


MINIMIZES NITROGEN LOSS
DMPP minimizes nitrogen loss by inhibiting nitrification and denitrification.
DESIGNED FOR BANDING
Specifically designed to inhibit nitrogen loss with banded applications.
GREATER ROI
Improves nitrogen efficiency and increases crop yields, maximizing your fertilizer investment.
REDUCES LEACHING & RUNOFF
Keeps nitrogen where your crops need it, minimizing nutrient loss.
active BANDIT™
BLENDS WITH UREA OR UAN
Compatible with urea or UAN, easily integrates into your existing fertilizer program.
LOWERS N_2O EMISSIONS
Decreases nitrous oxide emissions, helping to reduce your farm's environmental impact.

READ THE ENTIRE LABEL BEFORE USING THESE PRODUCTS.

ACTIVE STABILIZER™ PLUS BLENDING INSTRUCTIONS

Blending into UAN: Use 1 - 2 L of Active STABILIZER™ PLUS / 1000 kg UAN solution. Fill spray tank with half the desired amount of UAN, Measure the recommended quantity of Active STABILIZER™ PLUS and add to the tank. Mix well. Add other products at this stage, if needed. Add the second half of the UAN solution. Continue mixing until well blended. Keep agitator running while mixing. **Blending into UREA:** Use 1.2 - 2.4 L Active STABILIZER™ PLUS / 1000 kg Urea. For uniform blending, use a blender with impregnation equipment. Weigh the urea and transfer to blender. Add the required amount of Active STABILIZER™ PLUS to the urea in the blender. Blend until the Active STABILIZER ™ PLUS is uniformly mixed into the urea. Do not add any other fertilizer materials until Active STABILIZER™ PLUS is thoroughly distributed. If mixture appears wet or sticky, a drying agent may be added at this time.

ARM U™ 18% NBPT BLENDING INSTRUCTIONS

Blending into UAN: Use 1.2 L ARM U™/ 1000 kg UAN solution. Fill spray tank with half the desired amount of UAN, Measure the recommended quantity of Arm U™ and add to the tank. Mix well. Add other products at this stage, if needed. Add the second half of the UAN solution. Continue mixing until well blended. Keep agitator running while mixing. **Blending into UREA:** Use 2 L ARM U™/1000 kg Urea. For uniform blending, use a blender with impregnation equipment. Weigh the urea and transfer to blender. Add the required amount of ARM U to the urea in the blender. Blend until the ARM U™ is uniformly mixed into the urea. Do not add any other fertilizer materials until ARM U™ is thoroughly distributed. If mixture appears wet or sticky, a drying agent may be added at this time.

ARM U™ 30% NBPT BLENDING INSTRUCTIONS

Blending into UAN: Use 0.72 L ARM U™/ 1000 kg UAN solution. Fill spray tank with half the desired amount of UAN, Measure the recommended quantity of ARM U™ and add to the tank. Mix well. Add other products at this stage, if needed. Add the second half of the UAN solution. Continue mixing until well blended. Keep agitator running while mixing. **Blending into UREA:** Use 1.2 L ARM U™/1000 kg Urea. For uniform blending, use a blender with impregnation equipment. Weigh the urea and transfer to blender. Add the required amount of ARM U™ to the urea in the blender. Blend until the ARM U™ is uniformly mixed into the urea. Do not add any other fertilizer materials until ARM U™ is thoroughly distributed. If mixture appears wet or sticky, a drying agent may be added at this time.

READ THE ENTIRE LABEL BEFORE USING THESE PRODUCTS.

ARM U™ 15% DMPP BLENDING INSTRUCTIONS

Blending into UAN: Use 0.35 L ARM U™/ 1000 kg UAN solution. Fill spray tank with half the desired amount of UAN, Measure the recommended quantity of ARM U™ and add to the tank. Mix well. Add other products at this stage, if needed. Add the second half of the UAN solution. Continue mixing until well blended. Keep agitator running while mixing.

Blending into Urea: Use 0.6 L ARM U™/1000 kg Urea. For uniform blending, use a blender with impregnation equipment. Weigh the urea and transfer to blender. Add the required amount of ARM U™ to the urea in the blender. Blend until the ARM U™ is uniformly mixed into the urea. Do not add any other fertilizer materials until ARM U™ is thoroughly distributed. If mixture appears wet or sticky, a drying agent may be added at this time.

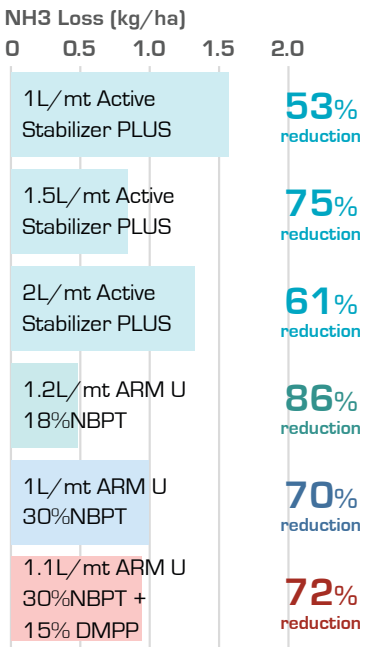
ACTIVE BANDIT™ BLENDING INSTRUCTIONS

Blending with UAN: Use 0.5 - 0.8 L of prepared mixture / 1000 kg of UAN solution. Fill spray tank with half the desired amount of UAN. Add the Active BANDIT™ mixture to the tank. Add other products at this stage, if needed. Add the second half of the UAN solution. Mix well. Keep agitator running while mixing.

Blending into Urea: Use 0.8 - 1 L of prepared mixture / 1000 kg of urea. For uniform blending, use a blender with impregnation equipment. Blend Active BANDIT™ / urea mixture thoroughly before adding other fertilizer materials; urea granules should be a uniform colour at this stage. If mixture is wet or sticky, a drying agent may be added at this time.

NH3 LOSS - UREA • 3rd Party Research by the University of Manitoba - 2021

TREATMENT	BANDED		BROADCAST	
	CUMULATIVE NH3 LOSS (kg/ha)	% NH3 REDUCTION	CUMULATIVE NH3 LOSS (kg/ha)	% NH3 REDUCTION
Urea	16.6		19.2	
1.2L/mt Active Stabilizer PLUS	4.6	72.5	7.4	61.5
1.8L/mt Active Stabilizer PLUS	3.4	79.4	4.8	75.2
2.4L/mt Active Stabilizer PLUS	2.7	83.8	5.7	70.3
2L/mt ARM U 18%NBPT	1.1	93.1	3.4	82.4
1.5L/mt ARM U 30%NBPT	1.3	92.3	2.4	87.6
1.8L/mt ARM U 30%NBPT + 15% DMPP	2.6	84.5	4.5	76.5



NH3 LOSS - UAN • 3rd Party Research by the University of Manitoba - 2021

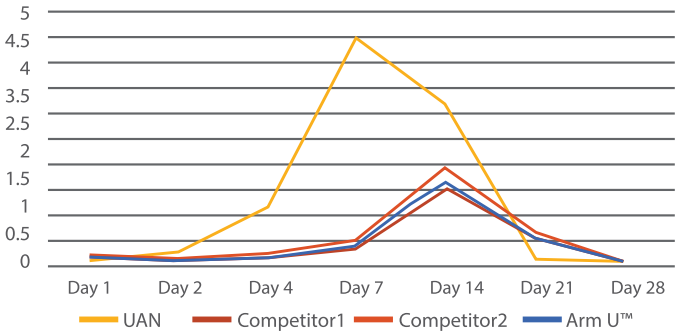
TREATMENT	DRIBBLE BANDED		BROADCAST	
	CUMULATIVE NH3 LOSS (kg/ha)	% NH3 REDUCTION	CUMULATIVE NH3 LOSS (kg/ha)	% NH3 REDUCTION
UAN	16.6		19.2	
1L/mt Active Stabilizer PLUS	1.6	53.1	2.1	23.7
1.5L/mt Active Stabilizer PLUS	0.8	75.0	2.7	1.9
2L/mt Active Stabilizer PLUS	1.3	60.5	2.6	6.2
1.2L/mt ARM U 18%NBPT	0.5	85.8	1.7	39.7
1L/mt ARM U 30%NBPT	1.0	70.4	1.6	41.4
1.1L/mt ARM U 30%NBPT + 15% DMPP	0.9	71.9	2.1	25.5

AMMONIA VOLATILIZATION FROM UAN

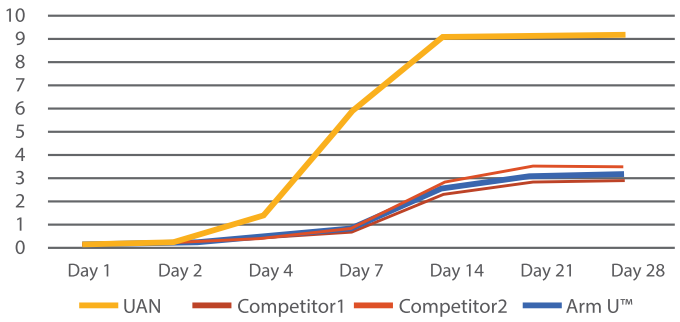
treated with ARM U™ 18%NBPT compared with two competitor products

ARM U™ 18% NBPT

Daily ammonia volatilization loss - kg N/ha

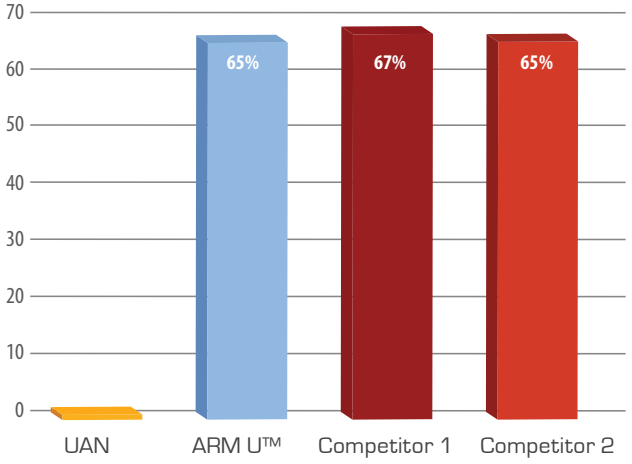


Cumulative ammonia volatilization loss - kg N/ha



3rd party Research conducted by University of Manitoba and University of Winnipeg

% Reduction of ammonia loss compared to untreated UAN



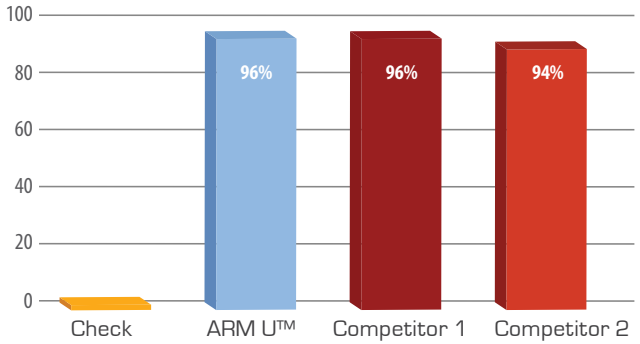
ARM U™ saves 65% of Nitrogen loss as ammonia gas from UAN.

AMMONIA VOLATILIZATION FROM UREA

treated with ARM U™ 18%NBPT compared with two competitor products

3rd party Research conducted by University of Manitoba and University of Winnipeg

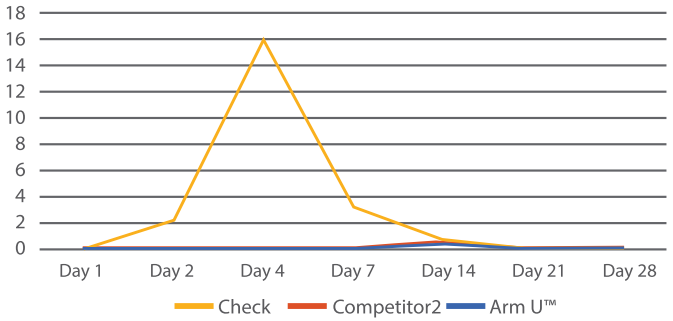
% Reduction of ammonia loss compared to untreated urea



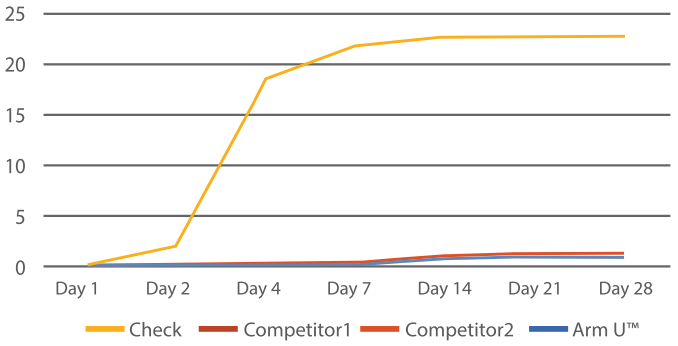
ARM U™ saves 96% of Nitrogen loss as ammonia gas from urea.

ARM U™ 18% NBPT

Daily ammonia volatilization loss - kg N/ha



Cumulative ammonia volatilization loss - kg N/ha



CANOLA • CARMAN EAST MANITOBA • 2018
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

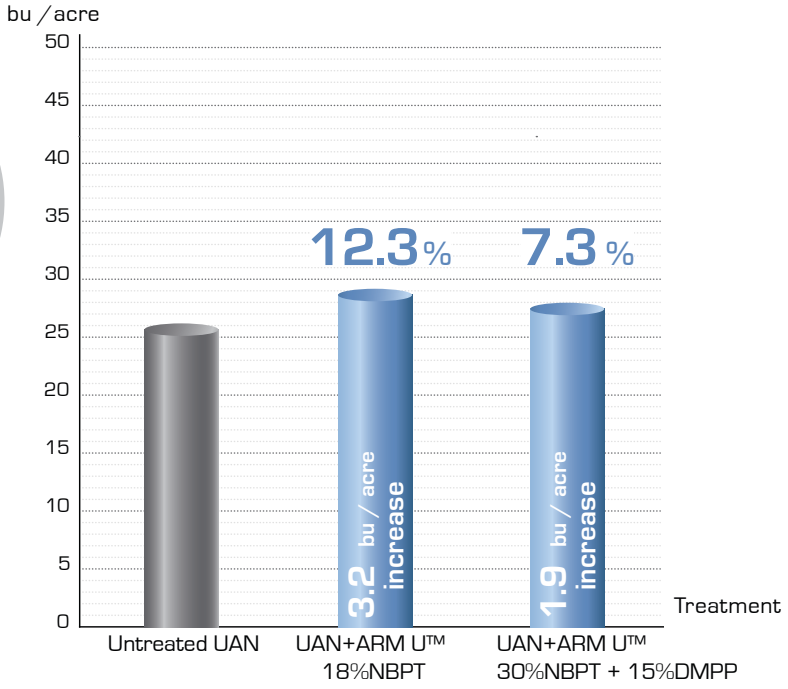
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	4.0		26.1	
UAN+ ARM U™ 18%NBPT @ 75 kg N/ha	4.2	-5	29.3	12.3
UAN + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	1.2	70	28.0	7.3

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • CARMAN EAST MANITOBA • 2018
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

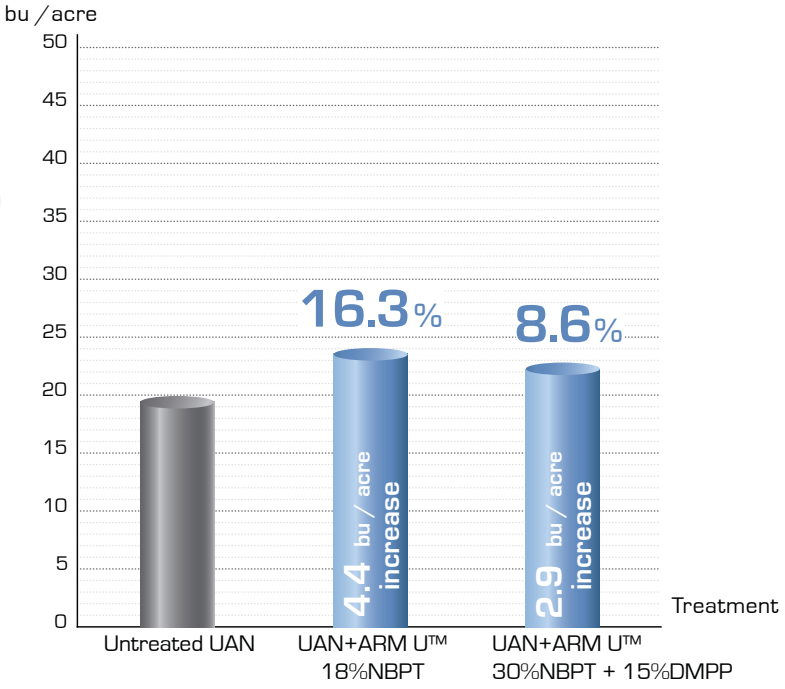
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	6.5		19.9	
UAN + ARM U™ 18%NBPT @ 75 kg N/ha	1.2	81	24.3	16.3
UAN + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	3.2	51	22.7	8.6

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • PORTAGE EAST MANITOBA • 2018
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

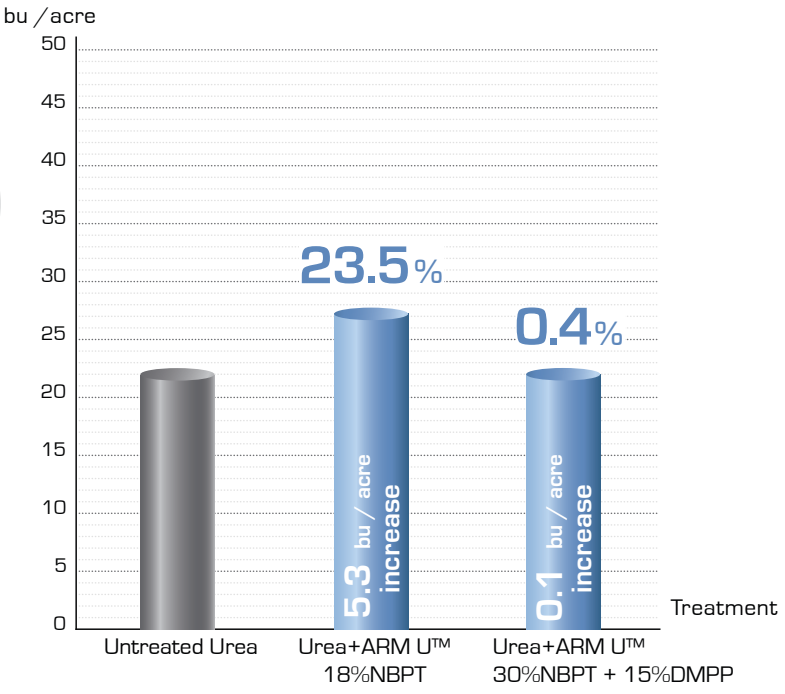
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated Urea @ 75 kg N/ha	15.1		22.5	
Urea + ARM U™ 18%NBPT @ 75 kg N/ha	2.9	81	27.8	23.5
Urea + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	3.1	79	22.6	0.4

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • CARMAN EAST MANITOBA • 2018
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

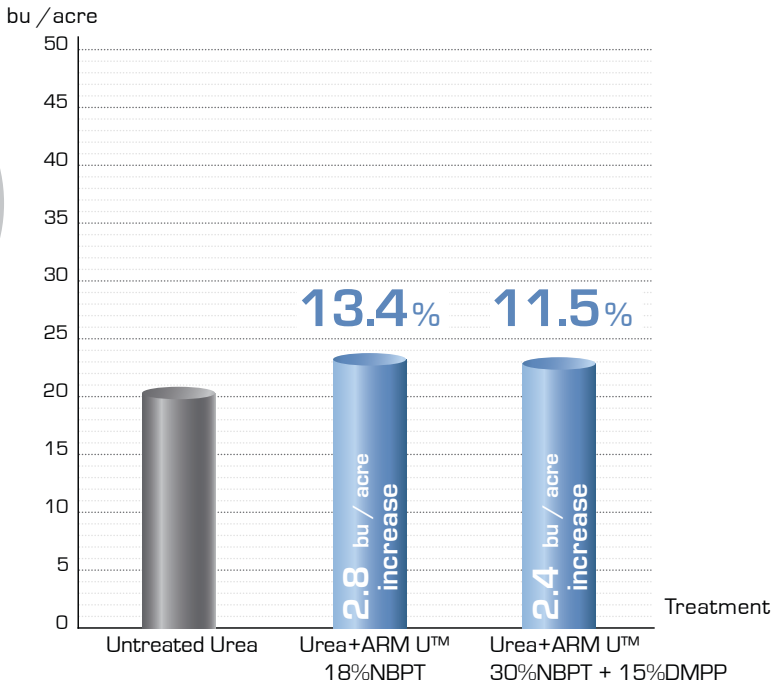
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated Urea @ 75 kg N/ha	16.6		20.9	
Urea+ ARM U™ 18%NBPT @ 75 kg N/ha	9.3	44	23.7	13.4
Urea + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	5.4	67	23.3	11.5

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • CARMAN MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

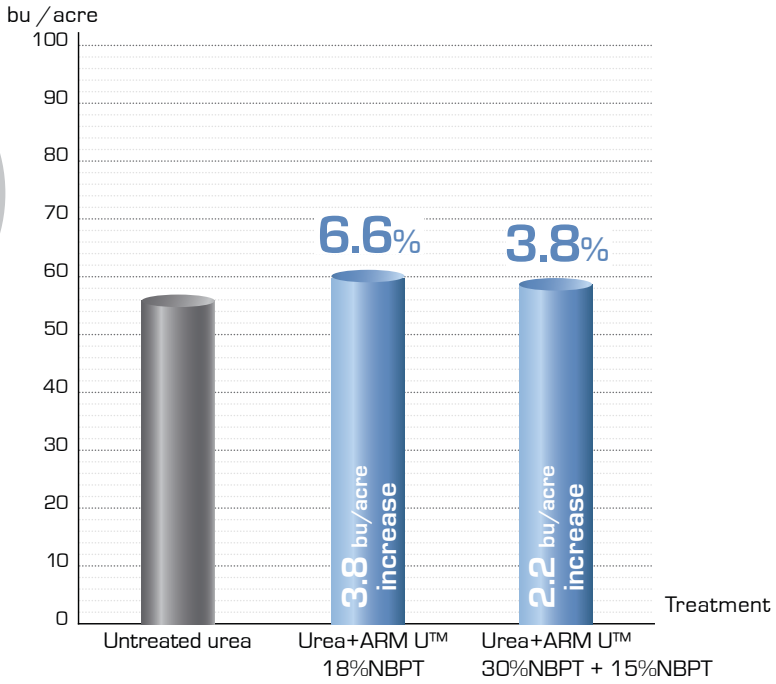
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated urea @ 100 kg N/ha	21.9	1.0	23.3		57.2	
Urea + ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	1.5	4.9	6.4	73.0	61.0	6.6
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	5.3	1.9	7.2	46.0	59.4	3.8

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



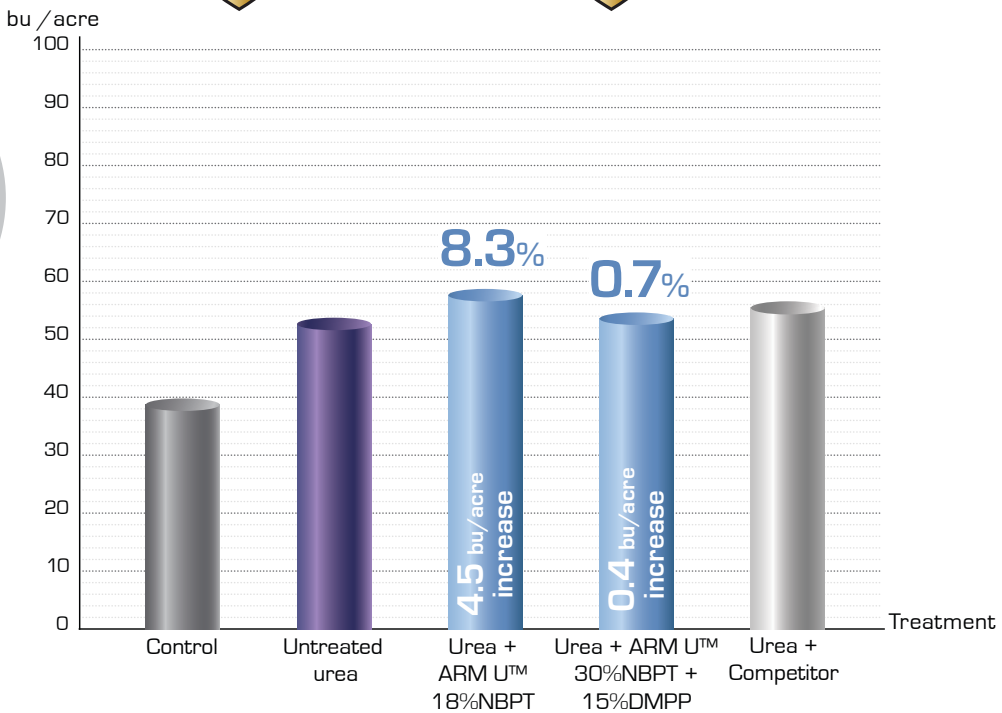
CANOLA • CARMAN MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.2	0	0.2		38.9	
Untreated urea @ 100 kg N/ha	10.8	6.7	17.5		53.9	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	0.2	3.2	3.4	81.0	58.4	8.3
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 100 kg N/ha	0.4	4.4	4.8	73.0	54.3	0.7
Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha	0.3	4.3	4.6	73.0	56.6	5.0

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • CARMAN MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

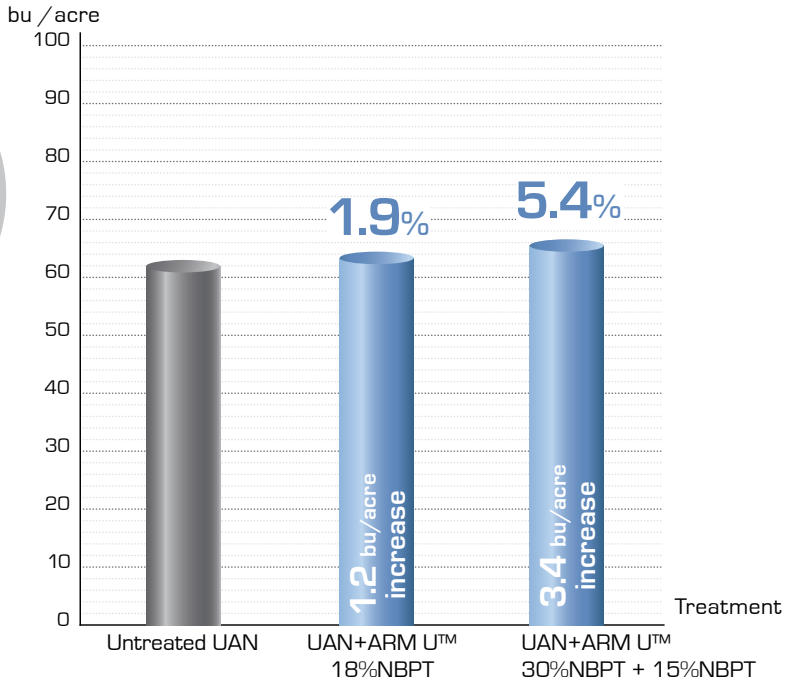
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	2.1	0.9	3.0		63.1	
UAN + ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 75 kg N/ha	0.5	4.6	5.1	70.0	64.3	1.9
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	0.8	3.5	4.3	43.3	66.5	5.4

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



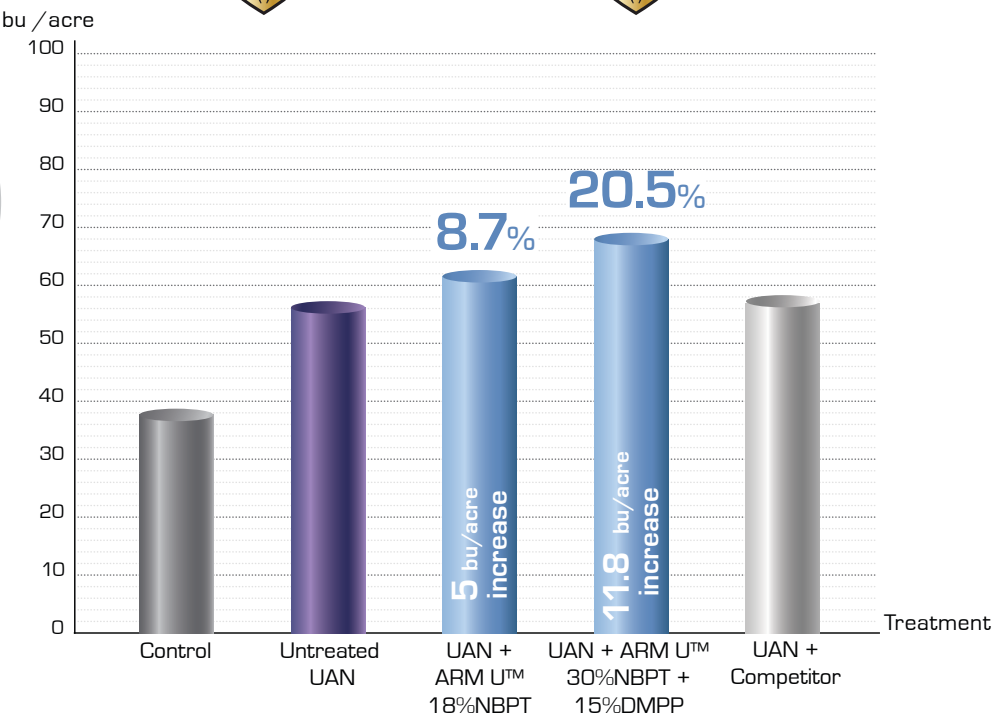
CANOLA • CARMAN MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.2	0	0.2		38.9	
Untreated UAN @ 100 kg N/ha	0.5	1.3	1.8		57.6	
UAN mixed with ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 100 kg N/ha	0.4	1.3	1.4	22.0	62.6	8.7
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 100 kg N/ha	0.4	1.1	1.1	56.0	69.4	20.5
UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha	0.2	0.8	1.0	47.0	58.4	1.4

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • PORTAGE MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

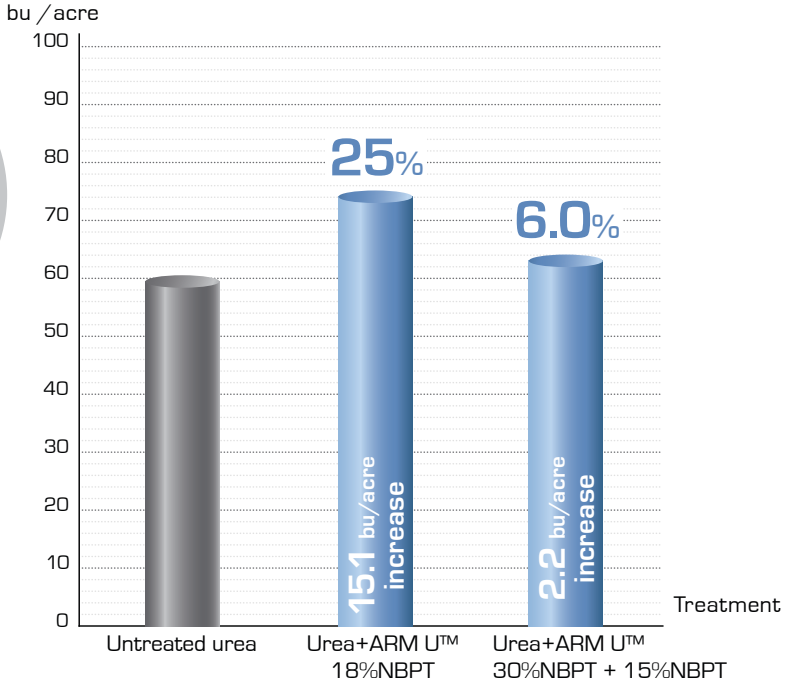
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated urea @ 100 kg N/ha	5.2	21.9	27.1		60.4	
Urea + ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	1.0	13.8	14.8	45.0	75.5	25.0
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	1.3	17.1	18.4	37.0	64.0	6.0

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



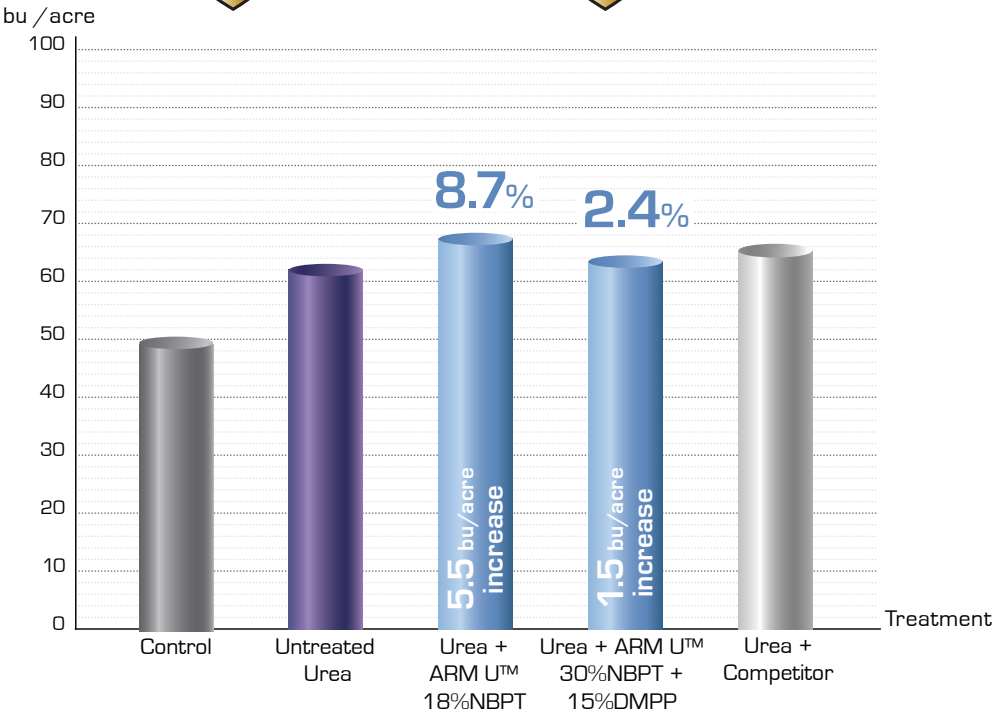
CANOLA • PORTAGE MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.3	0.5	0.8		50.4	
Untreated urea @ 100 kg N/ha	6.8	10.5	17.8		63.0	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	1.0	2.0	3.0	83.0	68.5	8.7
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 100 kg N/ha	1.6	3.2	4.8	72.0	64.5	2.4
Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha	1.3	1.7	3.0	83.0	66.4	5.4

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



CANOLA • PORTAGE MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

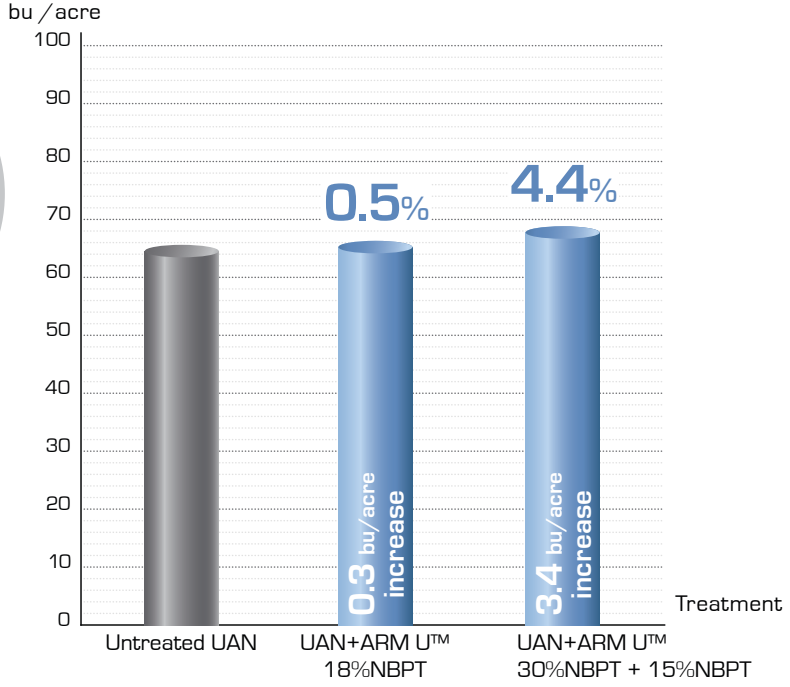
Cumulative ammonia volatilization losses (% of applied N) and Yield

Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	3.0	10.8	13.8		65.9	
UAN + ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 75 kg N/ha	1.3	10.3	11.6	16.0	66.2	0.5
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	2.4	9.9	12.3	11.0	68.8	4.4

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP

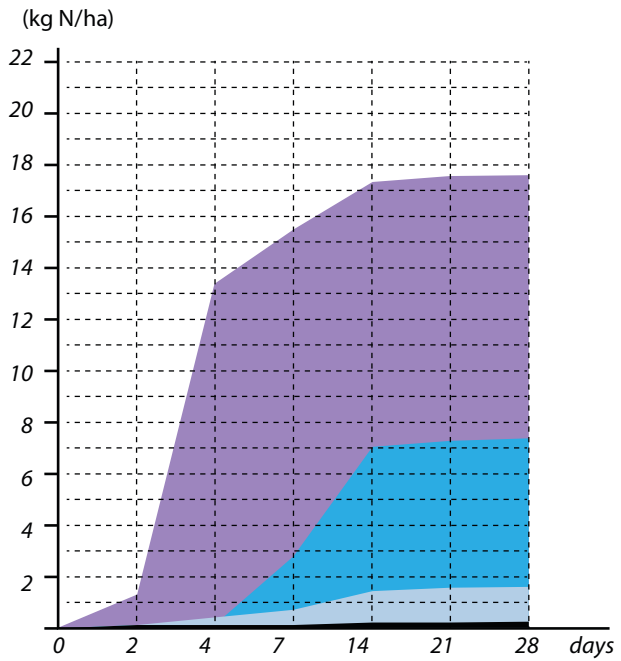


VOLATILIZATION & YIELD DATA - ARM U™ 18%NBPT - 2016

Cumulative ammonia loss • Canola • Carman, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.1	0.1	0.2	0.2	0.2
Urea+ARM U™	0.1	0.4	0.7	1.4	1.5	1.5
Urea+Competitor	0.1	0.2	2.9	7.0	7.2	7.3
Urea	1.3	13.4	15.4	16.7	16.8	16.8

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Yield increase
Check					
Urea+ARM U™	92%	15.3	33.3	34.2	5.9
Urea+Competitor	58%	9.5	20.8	33.2	2.8
Urea				32.3	



Check

Urea + ARM U™ **92% reduction • 5.9% yield increase**

Urea + Competitor **58% reduction • 2.8% yield increase**

Urea

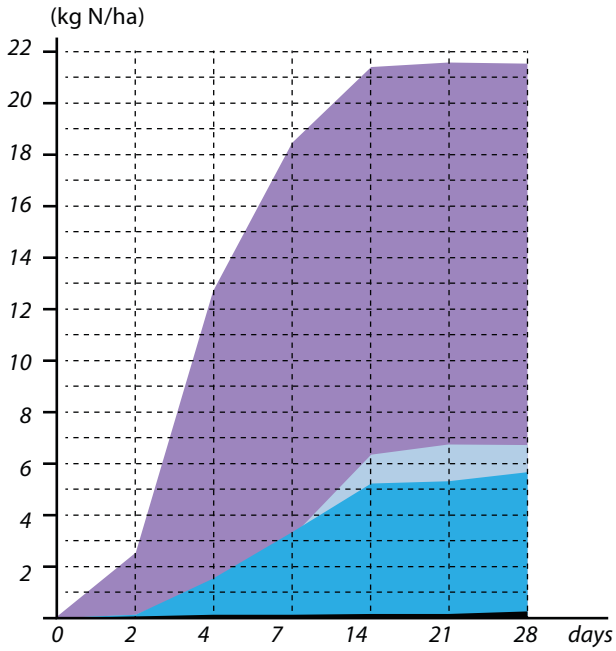
Third-party research conducted by:
University of Manitoba
University of Winnipeg

VOLATILIZATION & YIELD DATA - ARM U™ 18%NBPT - 2016

Cumulative ammonia loss • Canola • High Bluff, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.2	0.2	0.2	0.2	0.3
Urea+ARM U™	0.1	1.4	3.1	6.3	6.7	6.7
Urea+Competitor	0.1	1.6	3.1	5.1	5.2	5.7
Urea	2.6	12.9	18.5	21.3	21.6	21.6

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Yield increase
Check					
Urea+ARM U™	70%	14.9	32.3	33.1	134.8
Urea+Competitor	75%	15.9	34.6	41.3	192.9
Urea				14.1	



Check
Urea + ARM U™ **70% reduction • 134.8% yield increase**
Urea + Competitor **75% reduction • 192.9% yield increase**
Urea

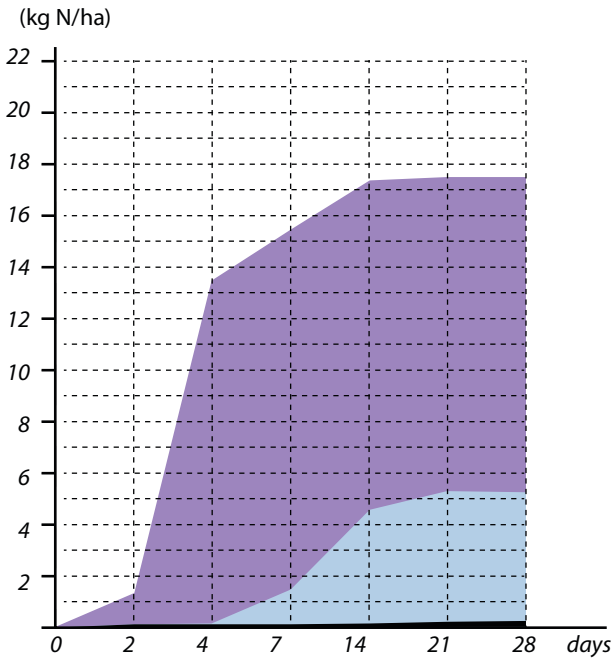
Third-party research conducted by:
University of Manitoba
University of Winnipeg

VOLATILIZATION & YIELD DATA - ARM U™ 30%NBPT + 15%DMPP - 2016

Cumulative ammonia loss • Canola • Carman, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.1	0.1	0.2	0.2	0.2
Urea+ ARM U™	0.1	0.1	1.3	4.8	5.1	5.1
Urea	1.3	13.4	15.4	16.7	16.8	16.8

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Change
Check					
Urea + ARM U™	71%	11.7	25.4	37.4	15.8
Urea				32.3	



Check

Urea + ARM U™ 30%NBPT + 15%DMPP

Urea

71% reduction

15.8% yield increase

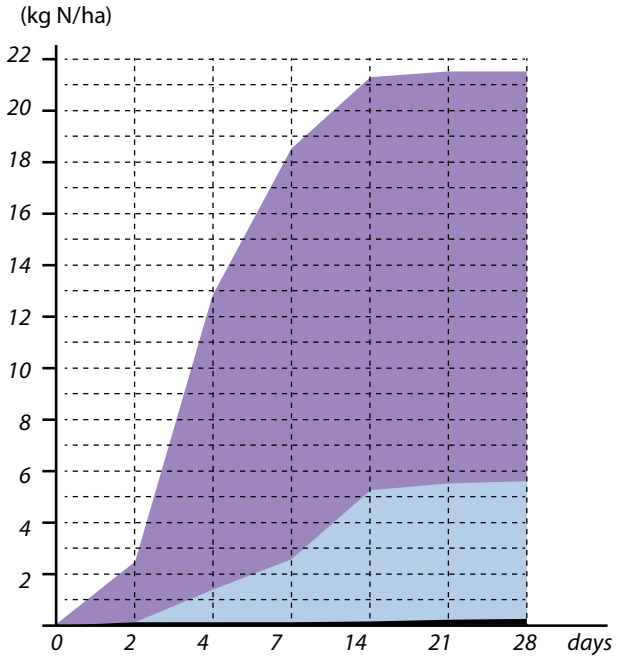
Third-party research conducted by:
University of Manitoba
University of Winnipeg

VOLATILIZATION & YIELD DATA - ARM U™ 30%NBPT + 15%DMPP - 2016

Cumulative ammonia loss • Canola • High Bluff, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.2	0.2	0.2	0.2	0.3
Urea + ARM U™	0.1	1.4	2.7	5.2	5.4	5.5
Urea	2.6	12.9	18.5	21.3	21.6	21.6

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Change
Check					
Urea + ARM U™	76%	16.1	35.0	39.3	178.7
Urea				14.1	



76% reduction

178.7% yield increase

Third-party research conducted by:
University of Manitoba
University of Winnipeg

WHEAT • PORTAGE WEST MANITOBA • 2018
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

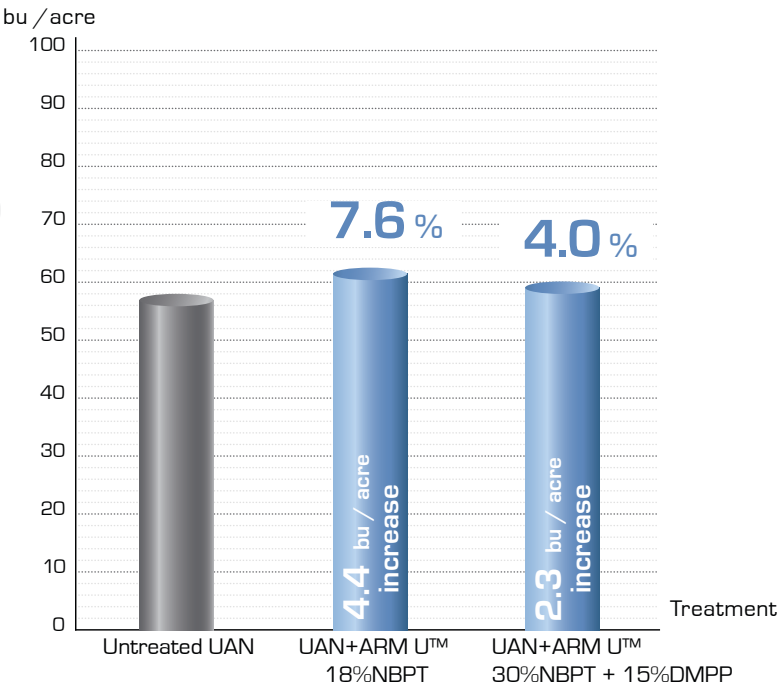
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	8.1		58.0	
UAN + ARM U™ 18%NBPT @ 75 kg N/ha	5.6	31	62.4	7.6
UAN + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	6.5	20	60.3	4.0

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • CARMAN WEST MANITOBA • 2018
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

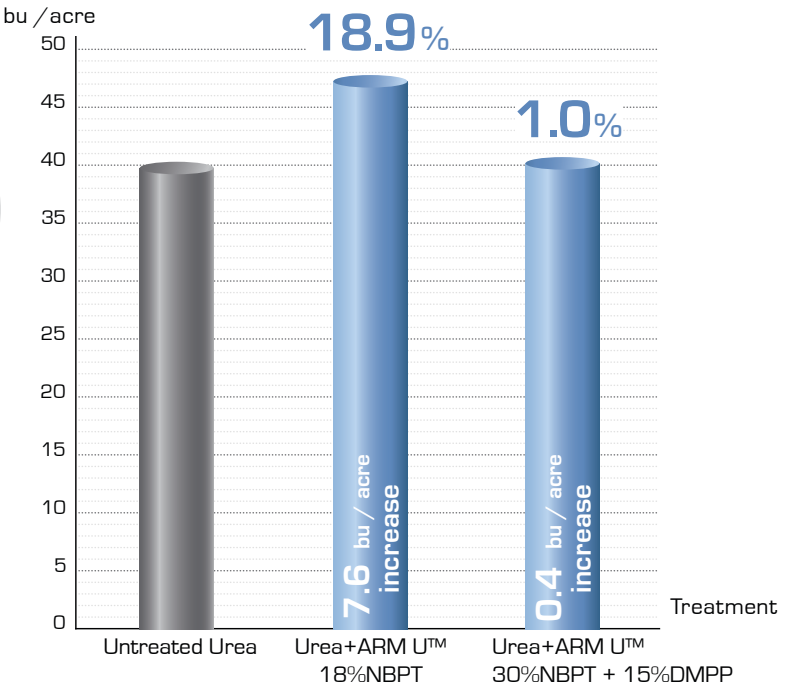
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated Urea @ 75 kg N/ha	6.9		40.3	
Urea + ARM U™ 18%NBPT @ 75 kg N/ha	2.4	65	47.9	18.9
Urea + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	5.1	26	40.7	1.0

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • CARMAN WEST MANITOBA • 2018
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

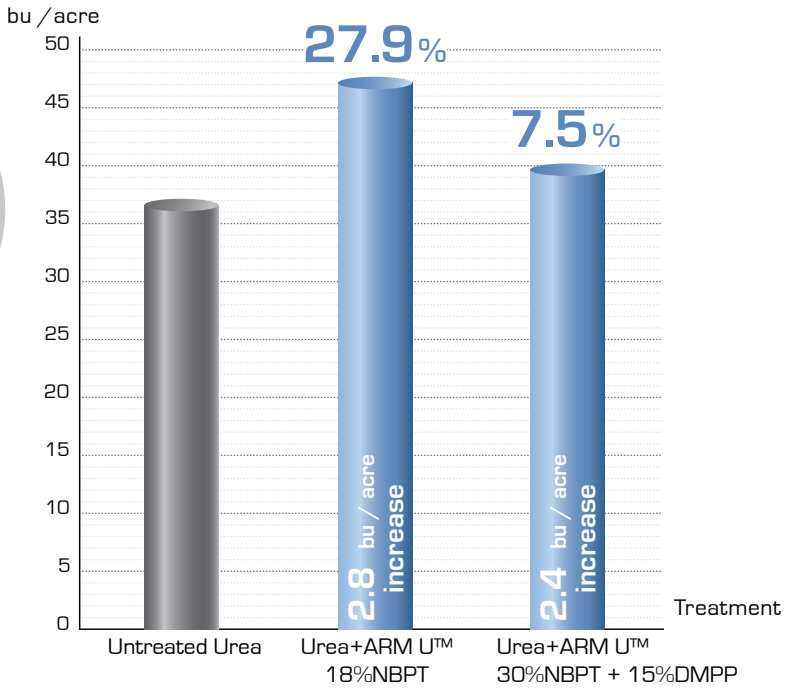
Treatment	Total NH3 loss (kg N/ha)	% Reduction	Yield (bu/acre)	% Change
Untreated Urea @ 75 kg N/ha	15.5		37.3	
Urea+ ARM U™ 18%NBPT @ 75 kg N/ha	2.8	82	47.7	27.9
Urea + ARM U™ 30%NBPT + 15%DMPP @ 75 kg N/ha	1.0	93	40.1	7.5

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • CARMAN MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

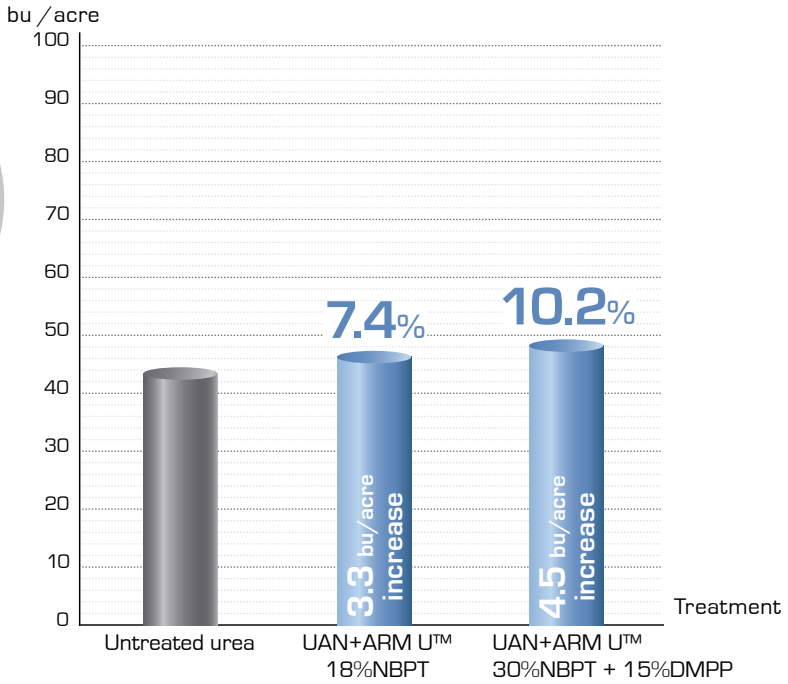
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	2.0	1.1	3.1		44.3	
UAN + ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 75 kg N/ha	0.4	0.9	1.3	58.0	47.6	7.4
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	0.9	1.0	1.9	38.0	48.8	10.2

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



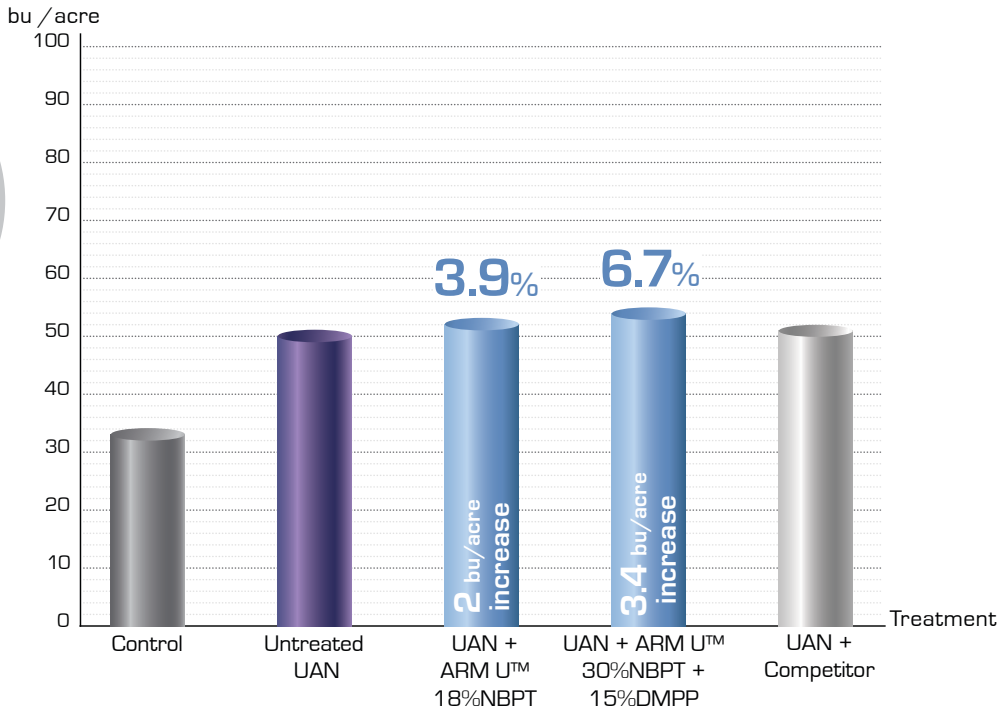
WHEAT • CARMAN MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.4	0.1	0.5		34.0	
Untreated UAN @ 100 kg N/ha	0.7	6.1	6.8		51.2	
UAN mixed with ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 100 kg N/ha	0.5	1.8	2.4	62.0	53.2	3.9
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 100 kg N/ha	0.4	1.3	1.7	75.0	54.4	6.7
UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha	0.4	1.5	1.9	72.0	52.0	1.6

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • CARMAN MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

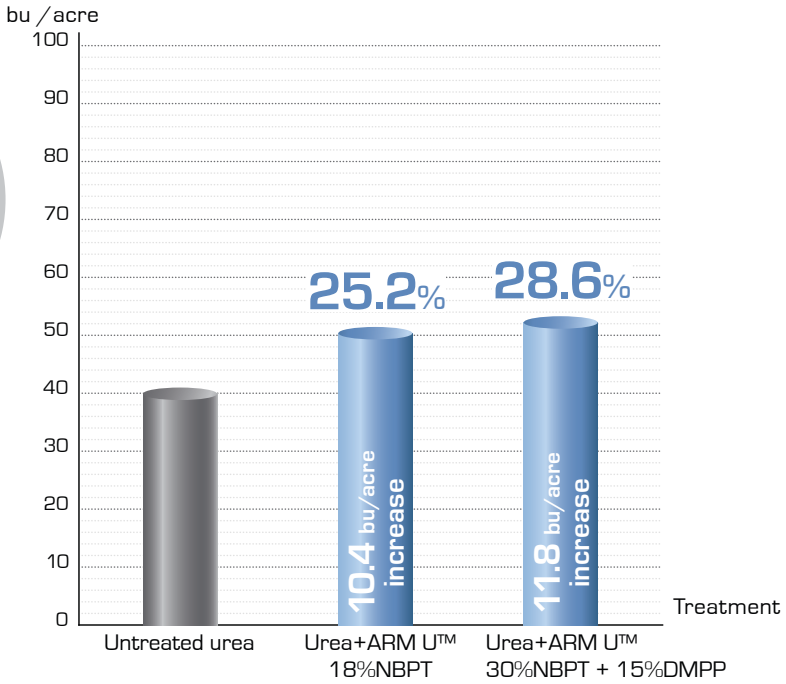
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated urea @ 100 kg N/ha	17.5	1.4	18.9		41.3	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	0.4	5.4	5.8	69.0	51.7	25.2
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 100 kg N/ha	5.8	2.7	8.5	55.0	53.1	28.6

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



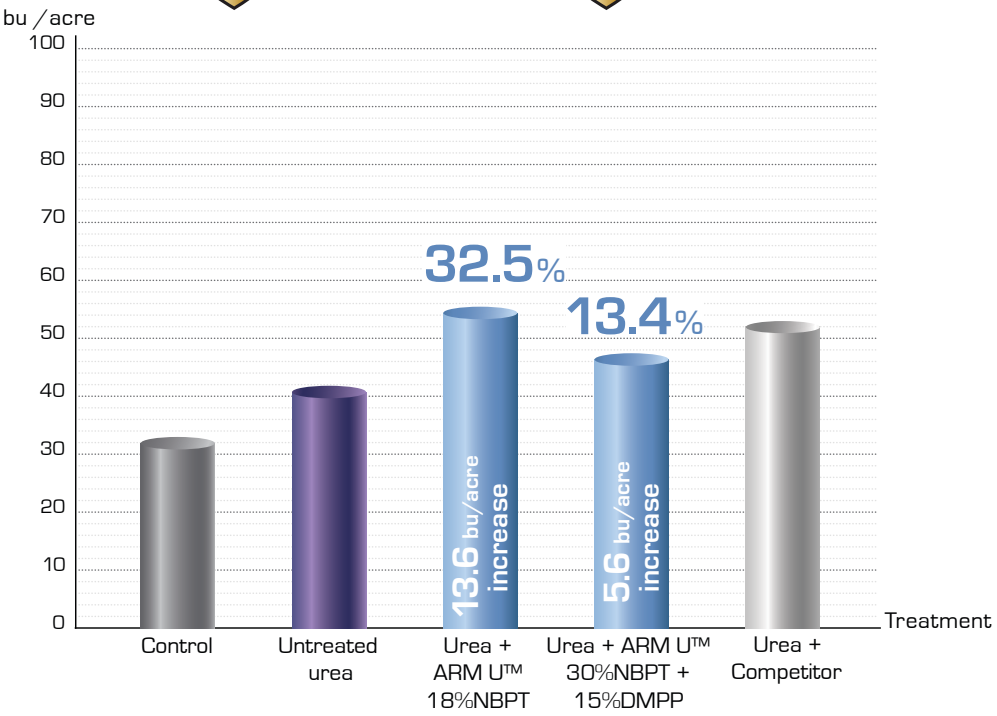
WHEAT • CARMAN MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.4	0.1	0.5		33.3	
Untreated urea @ 100 kg N/ha	7.9	8.8	16.7		41.9	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	0.3	4.7	5.0	70.0	55.5	32.5
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 100 kg N/ha	0.3	3.9	4.2	75.0	47.5	13.4
Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha	0.5	8.0	8.5	49.0	52.6	25.5

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • PORTAGE MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization losses (% of applied N) and Yield

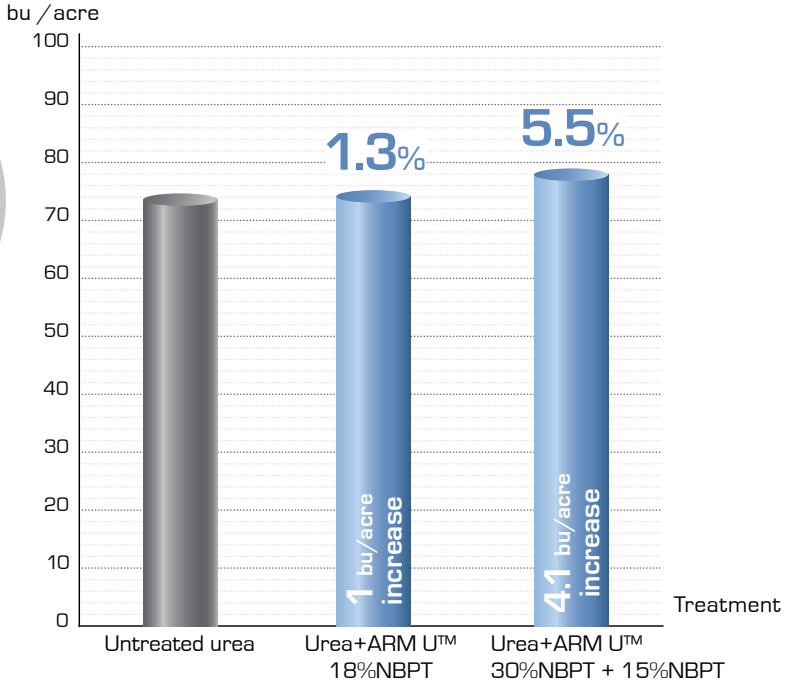
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated urea @ 100 kg N/ha	10.2	10.2	20.4		74.7	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	0.9	6.7	7.6	63.0	75.7	1.3
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 75 kg N/ha	2.3	10.3	12.6	56.0	78.8	5.5

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



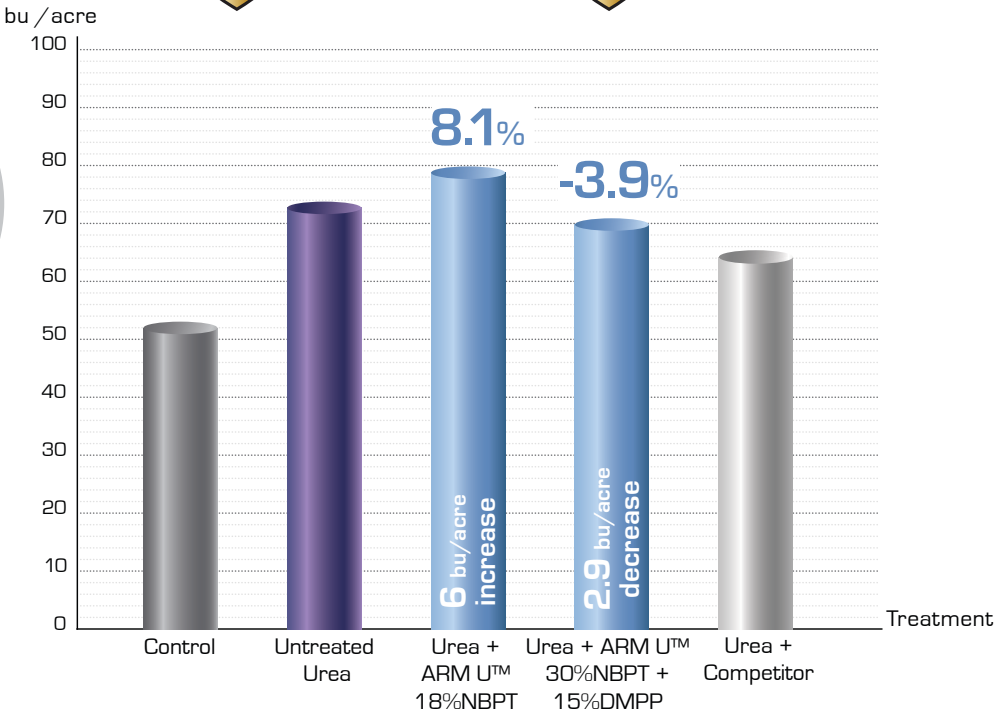
WHEAT • PORTAGE MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with Urea

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.4	0.1	0.5		53.4	
Untreated urea @ 100 kg N/ha	8.0	4.1	12.1		73.9	
Urea coated with ARM U™ 18%NBPT (2 L/1000 kg rate) @ 100 kg N/ha	1.0	2.2	3.2	74.0	79.9	8.1
Urea + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 kg rate) @ 100 kg N/ha	1.1	2.1	3.2	73.0	71.0	-3.9
Urea + Commercial Product (2 L/1000 kg rate) @ 100 kg N/ha	1.0	4.3	5.3	56.0	65.7	-11.1

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



WHEAT • PORTAGE MANITOBA • 2017
Spring applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization losses (% of applied N) and Yield

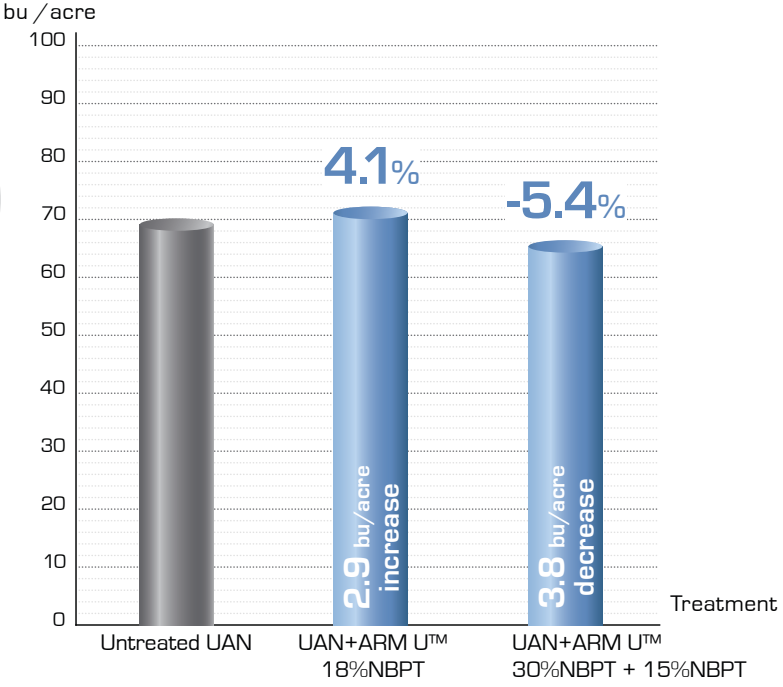
Treatment	Day 0-7	Day 14-28	Total	% Reduction	Yield (bu/acre)	% Change
Untreated UAN @ 75 kg N/ha	5.4	8.5	13.9		70.2	
UAN + ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 75 kg N/ha	2.3	9.0	11.3	19.0	73.1	4.1
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 75 kg N/ha	2.8	13.3	16.1	-16.0	66.4	-5.4

Third-party research conducted by the University of Manitoba

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP



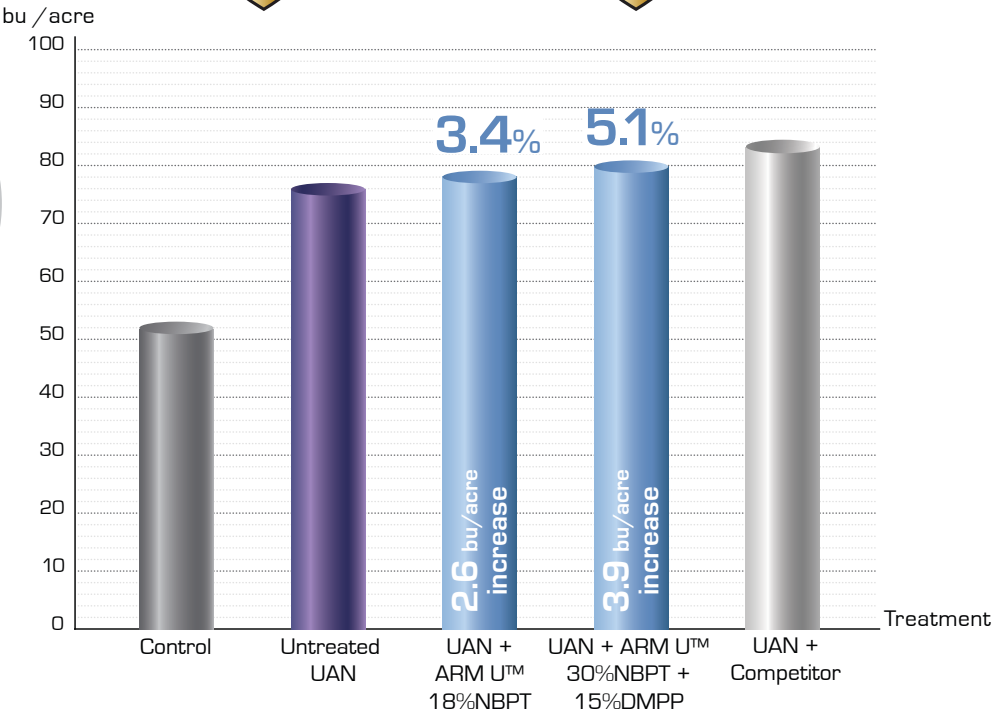
WHEAT • PORTAGE MANITOBA • 2017
Fall applied ARM U™ 18%NBPT, 30%NBPT, 15%DMPP with UAN

Cumulative ammonia volatilization loss (kg N/ha)	Day 0-7	Day 14-21	Total	% Reduction	Yield (bu/acre)	% Change
Control (without urea and UAN)	0.4	0.1	0.5		53.4	
Untreated UAN @ 100 kg N/ha	7.3	3.0	10.3		76.9	
UAN mixed with ARM U™ 18%NBPT (1.5 L/1000 L rate) @ 100 kg N/ha	2.2	3.3	5.5	46.0	79.5	3.4
UAN + ARM U™ 30%NBPT + 15%DMPP (1.5 L/1000 L rate) @ 100 kg N/ha	1.9	3.2	5.1	51.0	80.8	5.1
UAN + Commercial Product (1.5 L/1000 L rate) @ 100 kg N/ha	1.8	3.5	5.3	49.0	84.3	9.6

ARM U™ 18% NBPT

ARM U™ 30% NBPT

ARM U™ 15% DMPP

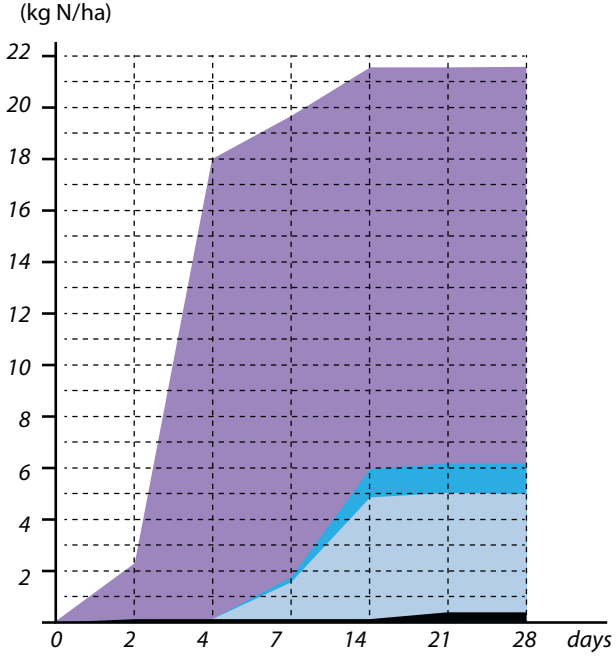


VOLATILIZATION & YIELD DATA - ARM U™ 18%NBPT - 2016

Cumulative ammonia loss • Wheat • Carman, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.2	0.2	0.1	0.3	0.3
Urea+ARM U™	0.1	0.2	1.7	4.9	5.0	5.0
Urea+Competitor	0.1	0.2	1.8	6.0	6.1	6.1
Urea	2.2	18.0	19.8	21.6	21.6	21.6

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Yield increase
Check				30.4	
Urea+ARM U™	78%	16.6	36	36.5	20.1
Urea+Competitor	73%	15.5	33.7	32.9	8.2
Urea				31.2	2.6



Check
Urea + ARM U™ 78% reduction • 20.1% yield increase
Urea + Competitor 73% reduction • 8.2% yield increase
Urea

Third-party research conducted by:
University of Manitoba
University of Winnipeg

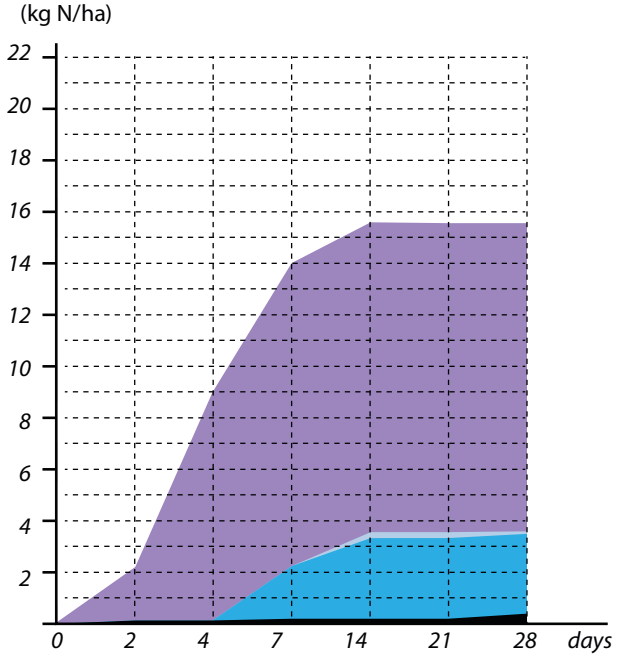
ARM U™ 18% NBPT

VOLATILIZATION & YIELD DATA - ARM U™ 18%NBPT - 2016

Cumulative ammonia loss • Wheat • High Bluff, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.1	0.2	0.2	0.2	0.3
Urea+ARM U™	0.1	1.0	2.3	3.5	3.5	3.5
Urea+Competitor	0.1	1.0	2.3	3.3	3.3	3.4
Urea	2.1	9.0	14.0	15.5	15.5	15.5

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Yield increase
Check				12.9	
Urea+ARM U™	79%	12.0	26.1	26.9	96.4
Urea+Competitor	79%	12.2	26.5	33.8	146.7
Urea				13.7	



- Check
- Urea + ARM U™ — **79% reduction • 96.4% yield increase**
- Urea + Competitor — **79% reduction • 146.7% yield increase**
- Urea

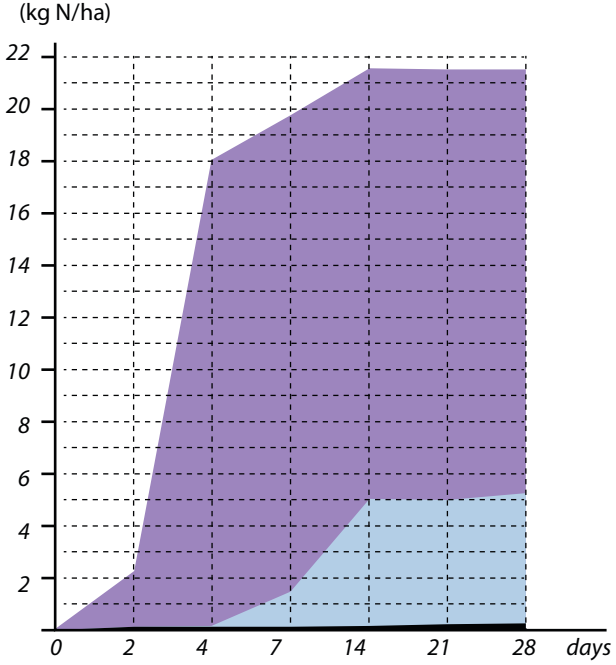
Third-party research conducted by:
University of Manitoba
University of Winnipeg

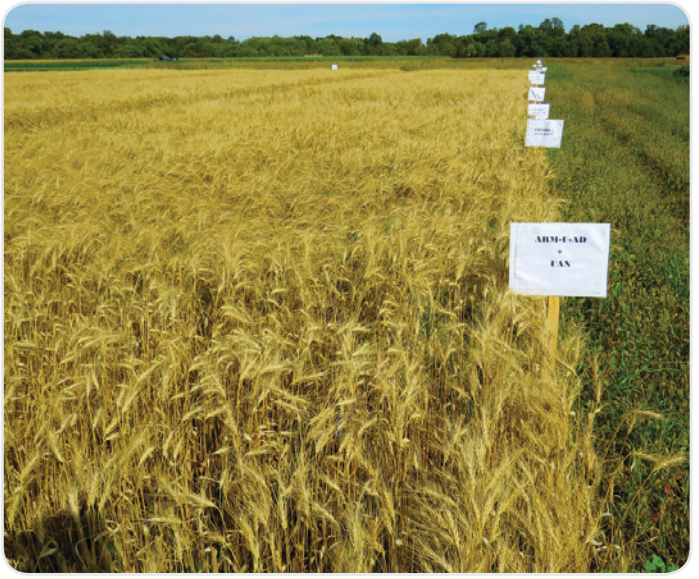
VOLATILIZATION & YIELD DATA - ARM U™ 30%NBPT + 15%DMPP - 2016

Cumulative ammonia loss • Wheat • Carman, Manitoba (kg N/ha)

Treatment	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28
Check	0.1	0.2	0.2	0.2	0.3	0.3
Urea + ARM U™	0.1	0.2	1.5	5.0	5.0	5.1
Urea	2.2	18.0	19.8	21.6	21.6	21.6

Treatment	% Reduction	kg of N saved/ha	kg of urea saved/ha	Yield (bu/acre)	% Change
Check				30.4	
Urea + ARM U™	78%	16.6	36	33.9	11.5
Urea				31.2	2.6





Check
Urea +ARM U™ 30%NBPT + 15%DMPP
Urea

78% reduction
11.5% yield increase
2.6% yield increase

Third-party research conducted by:
University of Manitoba
University of Winnipeg

CORN • ATWOOD ILLINOIS • 2018

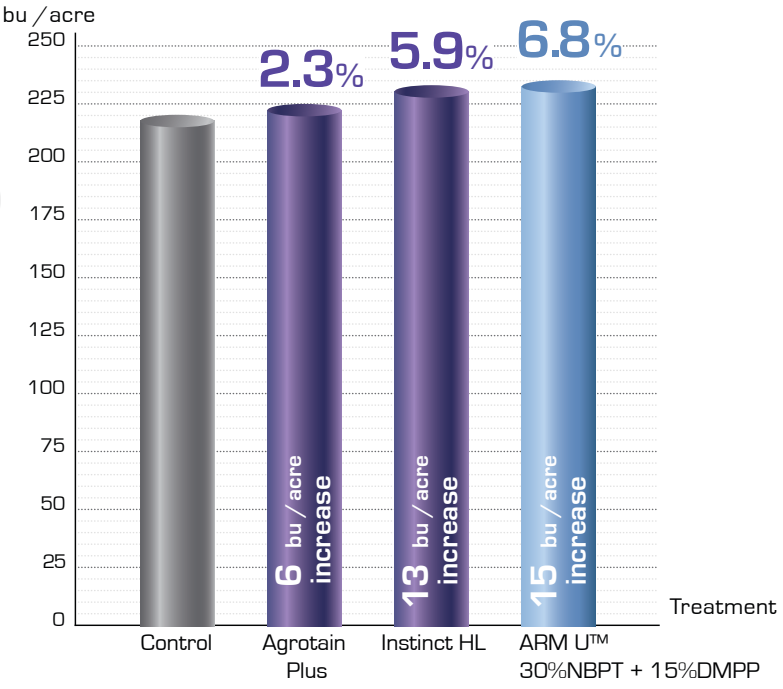
Dual nitrogen saving technologies compared to ARM U™ 30%NBPT + 15%DMPP

Treatment	Yield (bu/acre)	bu/acre difference	% Change
Untreated	220		
Agrotain Plus @ 168 kg N/ha	225	6	2.3
Instinct HL @ 168 kg N/ha	233	13	5.9
ARM U™ 30%NBPT + 15%DMPP @ 168 kg N/ha	235	15	6.8

Third-party research conducted by United Prairie, IL.

ARM U™ 30% NBPT

ARM U™ 15% DMPP

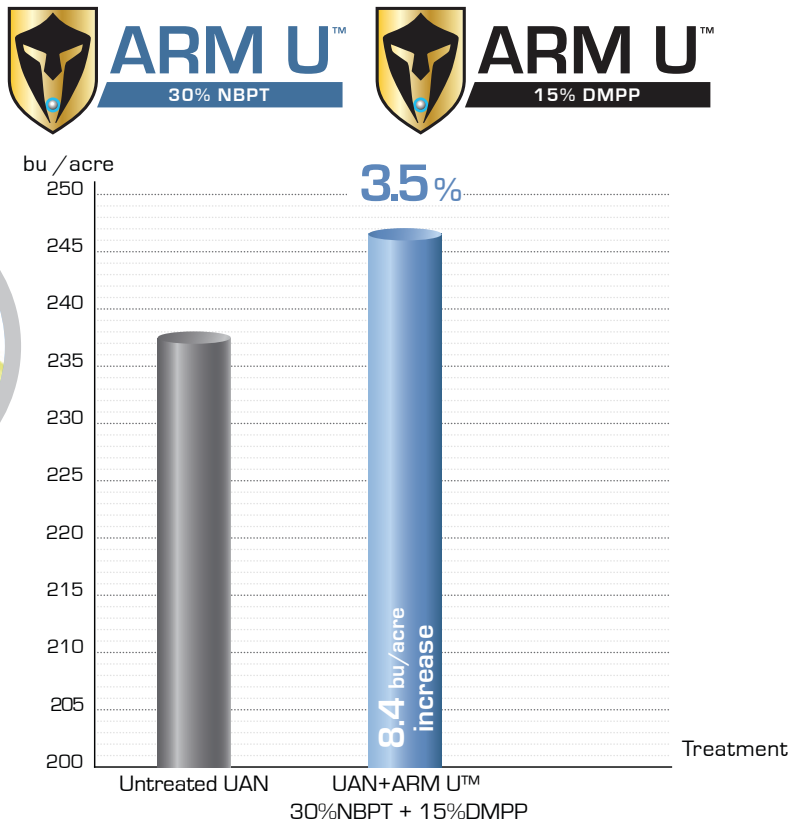


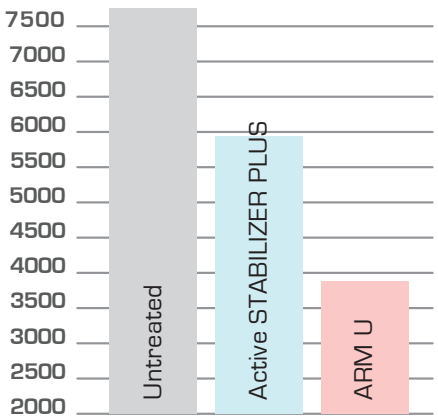
CORN • ATWOOD ILLINOIS • 2017
Spring applied UAN with ARM U™ 30%NBPT + 15%DMPP

Untreated UAN compared to UAN treated with ARM U™

Treatment	Yield (bu/acre)	bu/acre difference	% Change
Untreated UAN @ 224 kg N/ha	238		
UAN + ARM U™ 30%NBPT + 15%DMPP @ 224 kg N/ha	247	8.4	3.5

Third-party research conducted by United Prairie, IL.

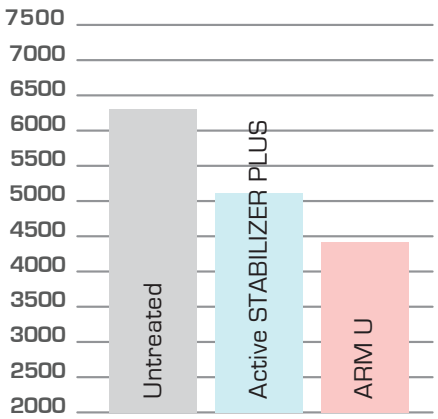




N_2O EMISSIONS from BROADCASTED UREA

3rd Party Research by the University of Manitoba

TREATMENT	N2O FLUX (g/ha)	DIFFERENCE	% REDUCTION
Untreated	7760		
Active STABILIZER PLUS	5965	1794	23.1
ARM U 30% NBPT + 15% DMPP	3889	3871	49.9



N_2O EMISSIONS from SHALLOW BANDED UREA

3rd Party Research by the University of Manitoba

TREATMENT	N2O FLUX (g/ha)	DIFFERENCE (g/ha)	% REDUCTION
Untreated	6301		
Active STABILIZER PLUS	5161	1141	18.1
ARM U 30% NBPT + 15% DMPP	4462	1839	29.2

active STABILIZER PLUS

Average efficacy: 100%

DATE	SAMPLING TIME	NBPT		DMPP	
		% NBPT	% EFFICACY	% DMPP	% EFFICACY
2023-01-25	14 months	10.9%	90.8%	1.9%	92.5%
2023-05-23	10 months	12.1%	100.8%	2.3%	116.0%
2023-09-18	6 months	12.1%	100.8%	2.0%	97.5%
2024-01-31	2 months	12.5%	104.2%	2.0%	97.5%

ARM U™ 18% NBPT

Average efficacy: 95%

DATE	SAMPLING TIME	NBPT	
		% NBPT	% EFFICACY
2023-03-29	12 months	17.7%	98.3%
2023-06-14	9 months	15.8%	87.8%
2023-11-11	4 months	16.5%	91.7%
2024-02-02	1 month	18.3%	101.7%

ARM U™ 30% NBPT

Average efficacy: 93%

DATE	SAMPLING TIME	NBPT	
		% NBPT	% EFFICACY
2023-05-16	10 months	29.6%	98.7%
2023-10-26	5 months	25.7%	85.7%
2024-02-05	1 month	28.6%	95.3%

ARM U™ 15% DMPP

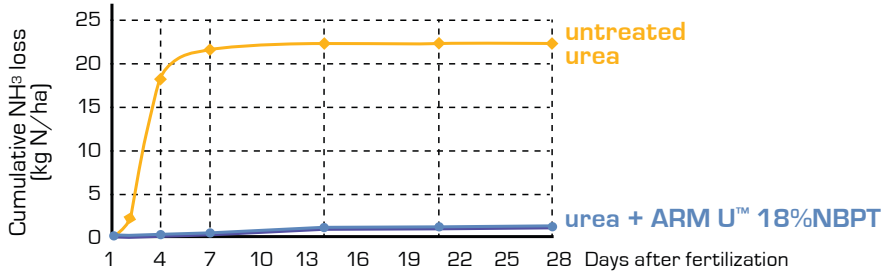
Average efficacy: 100%

DATE	SAMPLING TIME	DMPP	
		% DMPP	% EFFICACY
2023-05-05	10 months	15.1%	100.6%
2023-10-26	5 months	14.7%	97.9%
2024-03-01	0.5 months	15.5%	103.3%

ARM U 18%NBPT Cumulative Ammonia Volatilization (kg/ha) - UOM**/UOW**

Treatment	Day 1	Day 2	Day 4	Day 7	Day 14	Day 21	Day 28	% Control
Untreated Urea	0.11a	2.33a	18.46a	21.83a	22.53a	22.56a	22.57a	
Urea+ARM U™ - 2L/Mt	0.03b	0.07b	0.19b	0.35b	0.79b	0.93b	0.96b	96
Urea+ARM U™ - 3L/Mt	0.03b	0.06b	0.15b	0.26b	0.57b	0.69b	0.73b	97
Urea+Competitor 1 - 2L/Mt	0.03b	0.06b	0.17b	0.32b	0.74b	0.86b	0.88b	96
Urea+Competitor 2 - 2L/Mt	0.04b	0.09b	0.22b	0.42b	1.06	1.18b	1.21b	95

Cumulative ammonia volatilization



Shelflife Study - 2017 Volatilization Data (UOM**/UOW**)*

ARM U 18%NBPT treated urea has minimum one year shelflife

Treatments	TRT	Day 2	Day 4	Day 7	Day 14	Day 21 (Total)	% Reduction	kg of N saved/ha
ARM U™ UREA – April 2016	T1	0.6	1.4	2.0	3.8	4.3	87.3	28.8
ARM U™ UREA – October 2016	T2	1.7	2.6	4.1	8.5	9.0	73.2	24.2
ARM U™ UREA – January 2017	T3	0.8	1.4	2.1	5.5	6.3	81.1	26.8
ARM U™ UREA – Fresh (April 2017)	T4	0.5	1.1	1.8	8.5	8.7	73.9	24.4
UNTREATED UREA	T12	3.4	20.3	28.8	32.8	33.1		
ARM U™ UAN – October 2016	T5	2.7	3.6	5.2	8.0	8.6	73.3	23.2
ARM U™ UAN – January 2017	T6	2.3	3.8	5.8	8.7	9.4	70.6	22.4
ARM U™ UAN – Fresh (April 2017)	T7	3.0	5.5	6.9	10.5	11.9	62.6	19.8
UNTREATED UAN	T11	5.4	14.6	21.2	31.3	31.8		

* Treated samples were preserved at UOM**. Samples were analyzed April, 2017

** UOM-University of Manitoba

** UOW-University of Winnipeg

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