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TECHNOLOGY BEYOND the POINT of NUTRITIONTM

PRODUCT GUIDE

NITROGEN

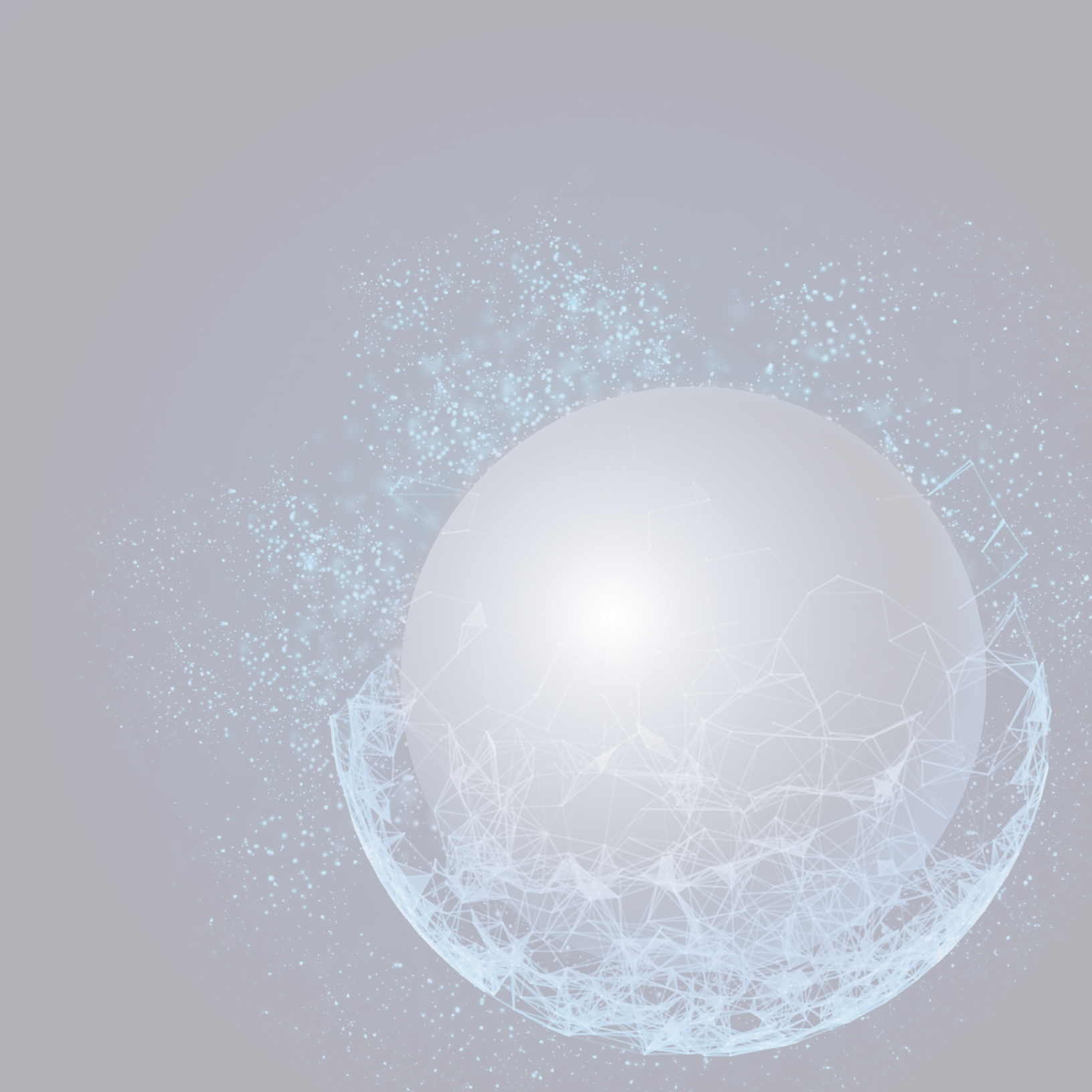
STABILIZERS

ECONOMICAL

FLEXIBLE

SUSTAINABLE





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TECHNOLOGY BEYOND THE POINT OF NUTRITIONTM

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.

INTRODUCTION

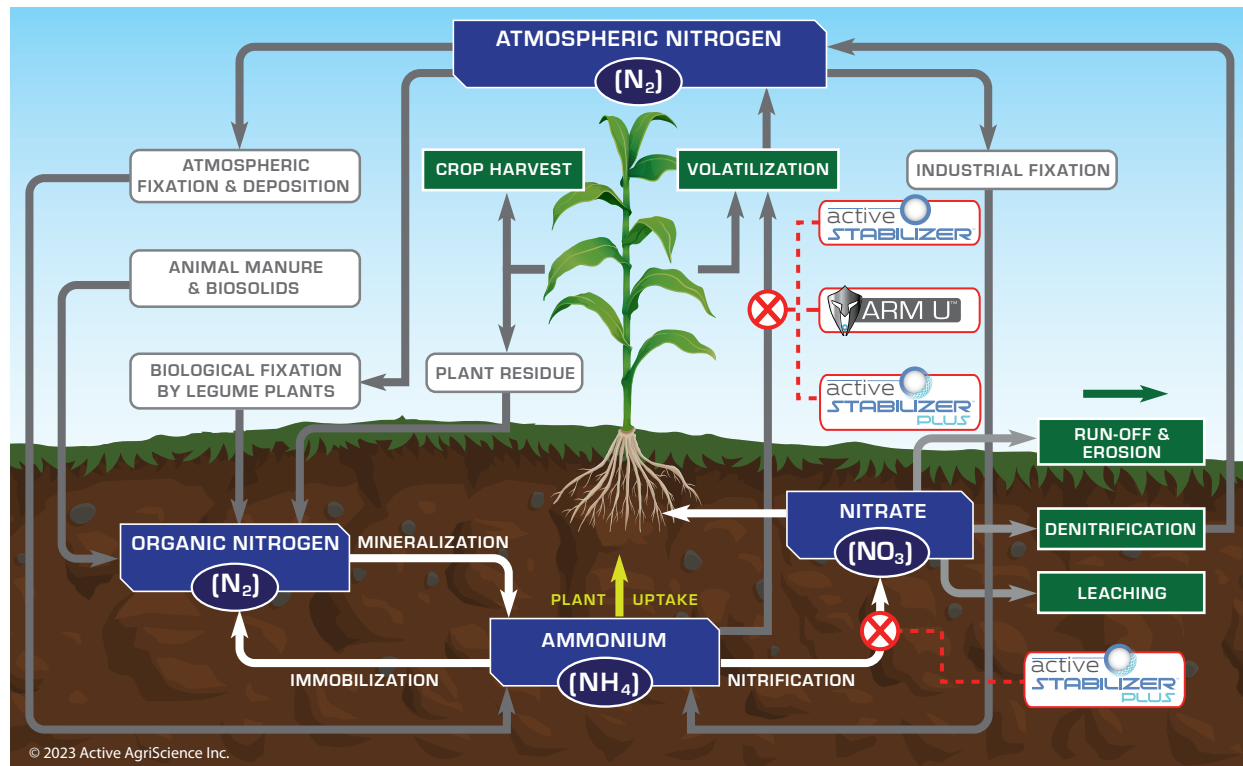
Nitrogen is essential for plant life and growth and is therefore a component of many fertilizers. Nitrogen loss is a challenge facing every grower when applying Urea or UAN in the spring or fall, regardless of the application method.

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.

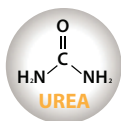
Understanding the nitrogen cycle and the factors that can result in nitrogen loss are crucial to finding the right solution to this problem



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

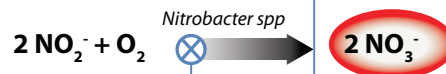
ARM U™ 18% NBPT
ARM U™ 30% NBPT
Active STABILIZER™
Active STABILIZER™ PLUS

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

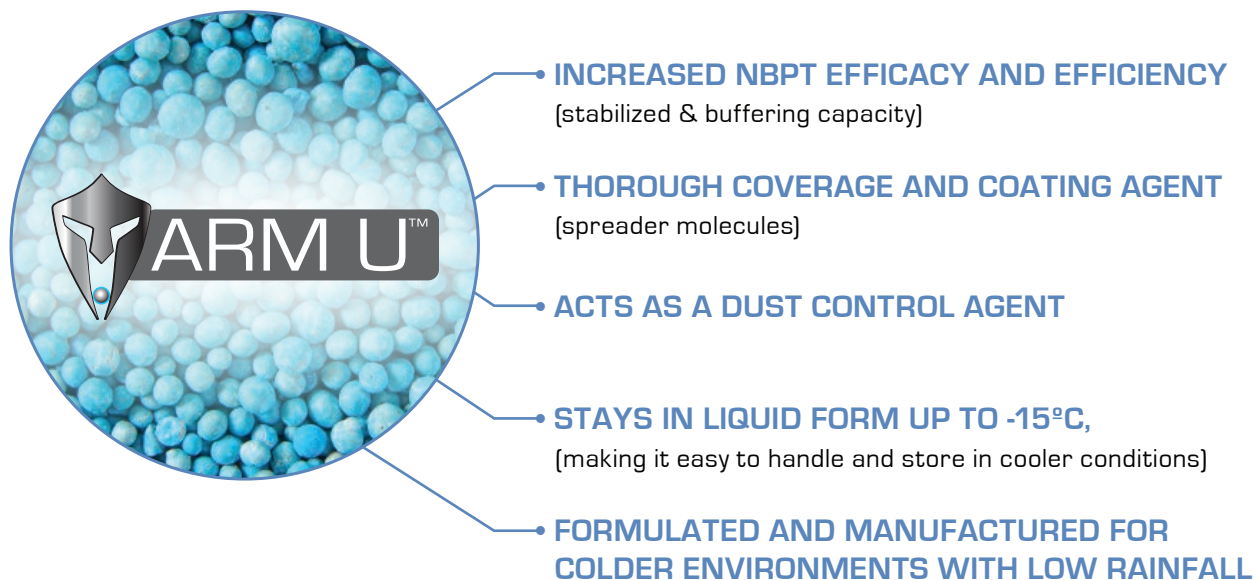
Active STABILIZER™ PLUS
ARM U 15% DMPP

inhibits nitrification
by inhibiting
Nitrosomonas and
Nitrobacter bacterial
activity.



BENEFITS of ARM U

ARM U™ is an NBPT soil fertilizer additive that allows plants to absorb and utilize nitrogen that would otherwise disappear too quickly through the conversion to ammonia gas. Give your crop the opportunity to flourish with the nitrogen it needs for healthy, rapid growth.

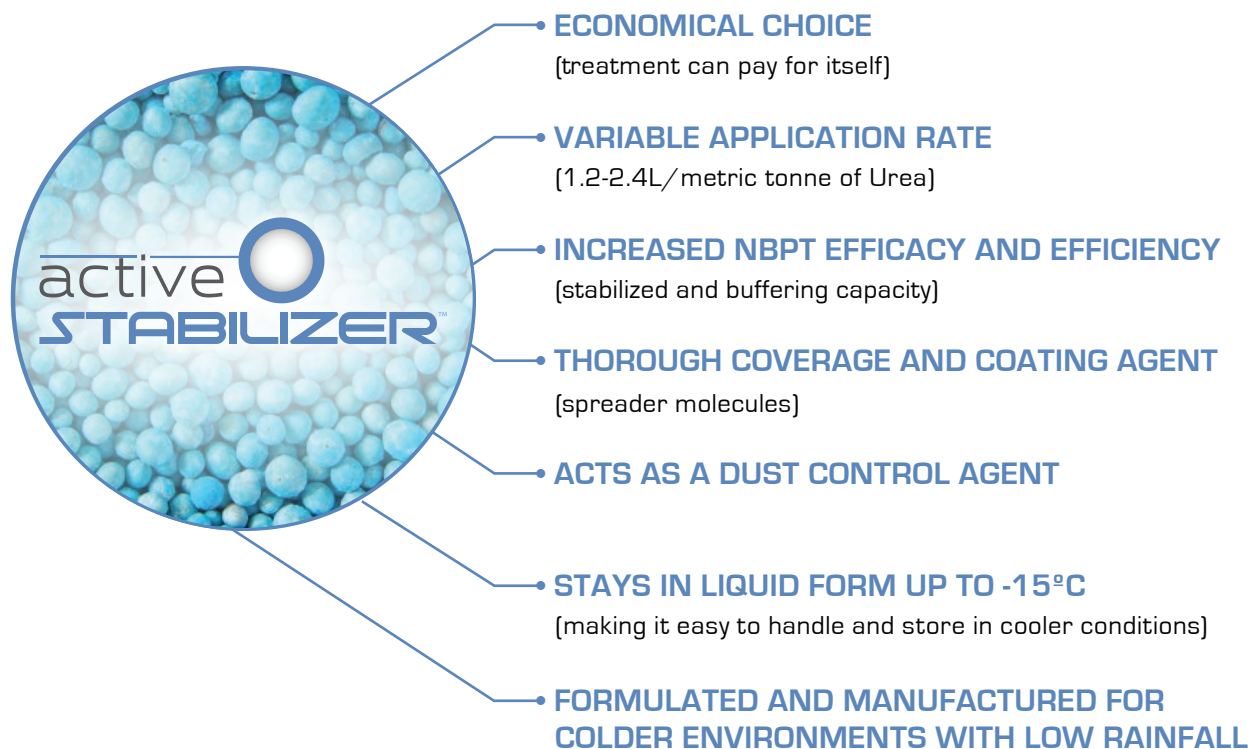


Patent numbers: USA: 9422203 B2; Canada: 2889430

Active ingredient: 18% N-(n-butyl) thiophosphoric triamide (NBPT), CAS No. 94317-64-3.

Total inactive ingredients: 82 % (preservative, colorant, spreading agents, surfactant).

Active STABILIZER™ helps prevent nitrogen loss through ammonia volatilization ensuring applied fertilizer is not wasted. With its low cost and unique variable application rate farmers can treat as necessary to maximize their return on investment.



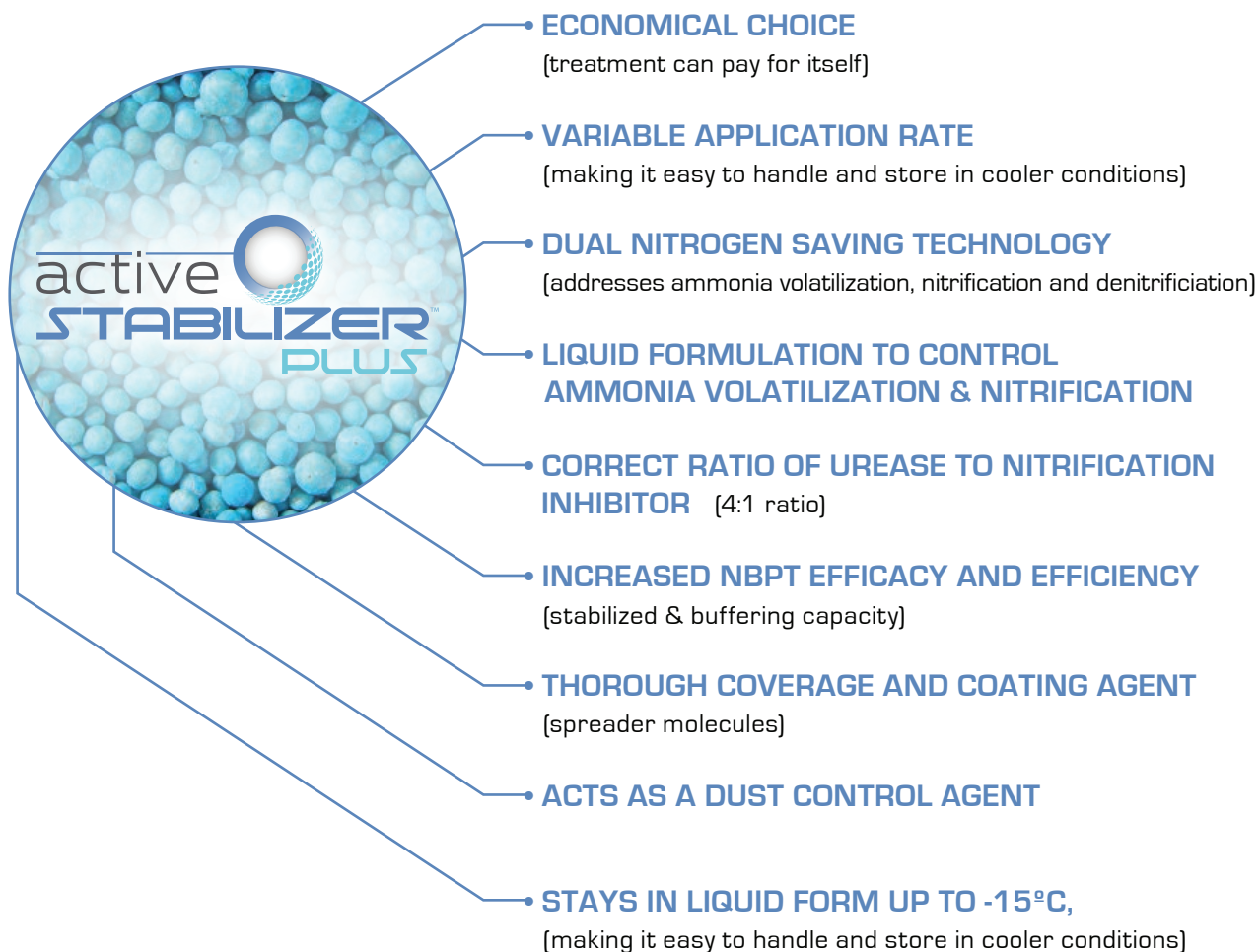
Patent numbers: USA: 9422203 B2; Canada: 2889430

Active ingredients: 12% N-(n-butyl) thiophosphoric triamide (NBPT) CAS No. 94317-64-3.

Total inactive ingredients: [88%] NMP [N-methyl-2-pyrrolidone] CAS No. 872-50-4, propylene glycol CAS No. 57-55-6, emulsifier, preservative, dye.

BENEFITS of ACTIVE STABILIZER™ PLUS

Active STABILIZER™ PLUS helps prevent nitrogen loss due to ammonia volatilization, nitrification and denitrification processes ensuring applied fertilizer is not wasted. In comparison to DCD products, the DMPP in Active STABILIZER™ PLUS offers superior efficacy and no bio-accumulation.



Patent Pending.

Active ingredients: 12% NBPT (N-(n-butyl) thiophosphoric triamide) CAS No. 94317-64-3;
2% DMPP (3,4-dimethylpyrazole phosphate) CAS No. 202842-98-6.

Total inactive ingredients: [86%] NMP (N-methyl-2-pyrrolidone) CAS No. 872-50-4, propylene glycol CAS No. 57-55-6, emulsifier, preservative, dye.

PRODUCT COMPARISON



ARM U 18% NBPT	ARM U 30% NBPT	ARM U 15% DMPP	Active STABILIZER PLUS	Active STABILIZER
18% NBPT	30% NBPT	No NBPT	12% NBPT	12% NBPT
No DMPP	No DMPP	15% DMPP	2% DMPP	No DMPP
2 L / MT of urea	1.2 L / MT of urea	1.8 L / MT of urea	1.2 - 2.4 L / MT of urea	1.2 - 2.4 L / MT of urea
Addresses ammonia volatilization	Addresses ammonia volatilization	Addresses nitrification, denitrification, leaching, and runoff	Addresses ammonia volatilization, nitrification, denitrification, leaching, and runoff	Addresses ammonia volatilization
Colder environments / low rainfall	Colder environments / low rainfall	Longer N preservation / leaching / runoff	Longer N preservation / leaching / runoff	Colder environments / low rainfall

APPLICATION RATES



ARM U™ 18% NBPT BLENDING INSTRUCTIONS:

READ THE ENTIRE LABEL BEFORE USING THESE PRODUCTS.

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 720 mL 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.



ARM U™ 15% DMPP BLENDING INSTRUCTIONS:

Blending into UAN: Use 1.1 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 1.8 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 STABILIZER™ BLENDING INSTRUCTIONS:

READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

Blending into UAN: Use 1 - 2 L Active STABILIZER™ / 1000 kg UAN solution. Fill spray tank with half the desired amount of UAN, Measure the recommended quantity of Active STABILIZER™ 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™ / 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 to the urea in the blender. Blend until the Active STABILIZER™ is uniformly mixed into the urea. Do not add any other fertilizer material until Active STABILIZER™ is thoroughly distributed. If mixture appears wet or sticky, a drying agent may be added at this time.



ACTIVE STABILIZER™ PLUS BLENDING INSTRUCTIONS:

READ THE ENTIRE LABEL BEFORE USING THIS PRODUCT.

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.

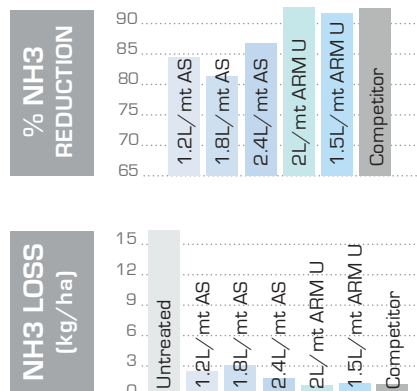
Blending into UREA: Use 1.2 - 2.4 L Active STABILIZER™ PLUS / 1000 kg Urea. For uniform blending, use a blender with impregnation equipment. Weigh the urea and transfer to blender. Add the required amount of Active STABILIZER™ PLUS to the urea in the blender. Blend until the Active STABILIZER™ PLUS is 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.

UREASE INHIBITORS

active
STABILIZER



BANDED UREA • 3rd Party Research by the University of Manitoba

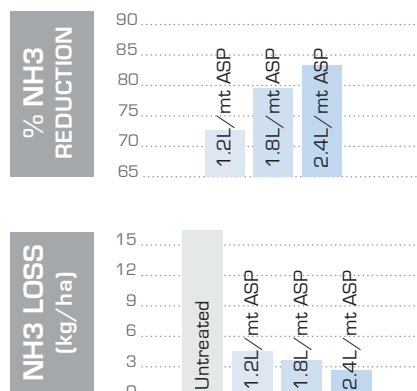


TREATMENTS	BANDED	
	NH3 loss (kg/ha)	% NH3 reduction
Untreated Urea	16.6	0.0
1.2L/mt Active STABILIZER (12% NBPT)	2.6	84.4
1.8L/mt Active STABILIZER (12% NBPT)	3.0	82.0
2.4L/mt Active STABILIZER (12% NBPT)	2.0	87.7
2L/mt ARM U (18% NBPT)	1.1	93.1
1.5L/mt ARM U (30% NBPT)	1.3	92.3
2.1L/mt Competitor (30% NBPT)	1.1	93.1

DUAL INHIBITORS



BANDED UREA • 3rd Party Research by the University of Manitoba

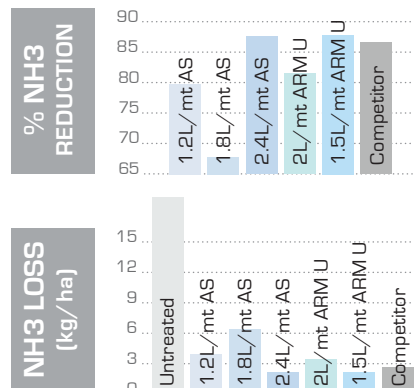


TREATMENTS	BANDED	
	NH3 loss (kg/ha)	% NH3 reduction
Untreated Urea	16.6	0.0
1.2L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	4.6	72.5
1.8L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	3.4	79.4
2.4L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	2.7	83.8

UREASE INHIBITORS



BROADCASTED UREA • 3rd Party Research by the University of Manitoba

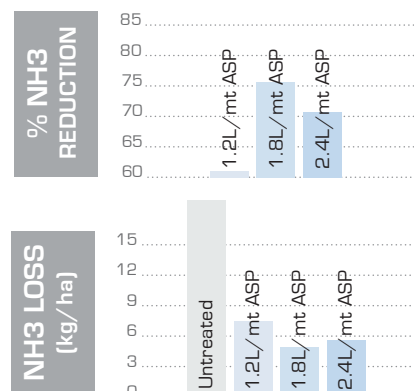


TREATMENTS	BROADCAST	
	NH3 loss (kg/ha)	% NH3 reduction
Untreated Urea	19.2	0.0
1.2L/mt Active STABILIZER (12% NBPT)	3.9	79.6
1.8L/mt Active STABILIZER (12% NBPT)	6.2	67.6
2.4L/mt Active STABILIZER (12% NBPT)	2.4	87.4
2L/mt ARM U (18% NBPT)	3.4	82.4
1.5L/mt ARM U (30% NBPT)	2.4	87.6
2.1L/mt Competitor (30% NBPT)	2.7	86.2

DUAL INHIBITORS



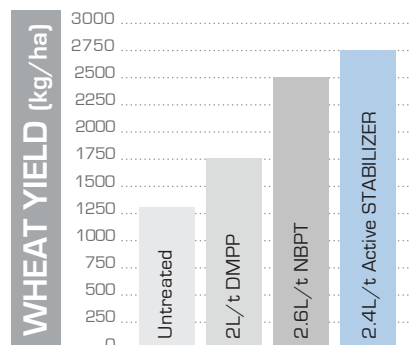
BROADCASTED UREA • 3rd Party Research by the University of Manitoba



TREATMENTS	BROADCAST	
	NH3 loss (kg/ha)	% NH3 reduction
Untreated Urea	19.2	0.0
1.2L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	7.4	61.5
1.8L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	4.8	75.2
2.4L/mt Active STABILIZER PLUS (12% NBPT, 2% DMPP)	5.7	70.3

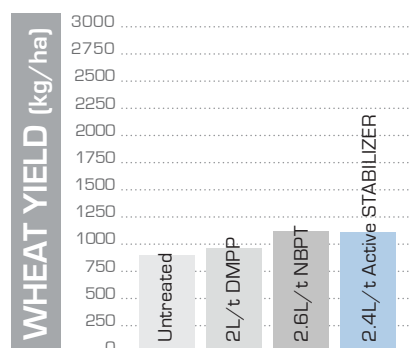


PASTURE YIELD WITH UREA APPLIED AT 400 kg/ha



TREATMENTS	1 ST CUT (kg/ha)	2 ND CUT (kg/ha)	3 RD CUT (kg/ha)	TOTAL	% CHANGE
Untreated urea - 400 kg/ha	250	750	300	1300	
DMPP urea - 400 kg/ha [2]	400	1000	350	1750	34.62
NBPT urea - 400 kg/ha [2.6]	500	1500	500	2500	92.31
Active Stabilizer - 400 kg/ha [2.4]	550	1800	400	2750	111.5

PASTURE YIELD WITH UREA APPLIED AT 100 kg/ha



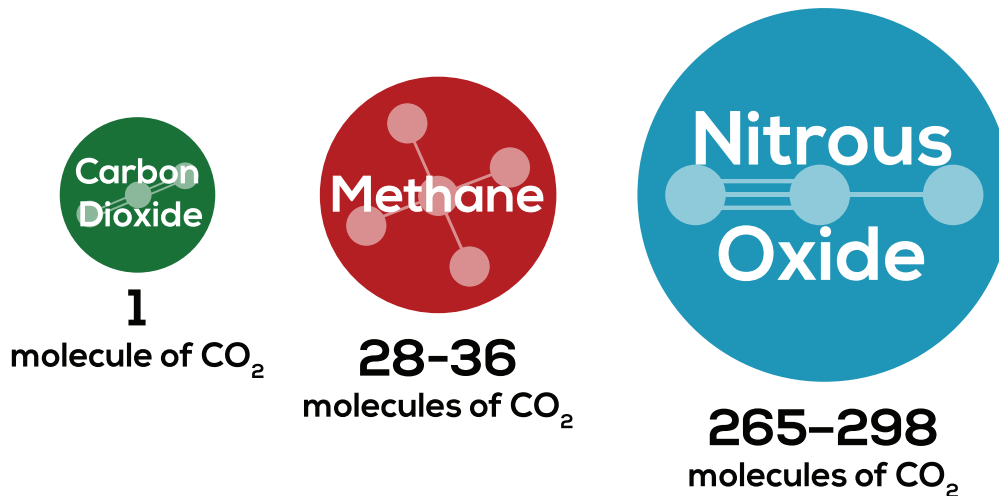
TREATMENTS	1 ST CUT (kg/ha)	2 ND CUT (kg/ha)	3 RD CUT (kg/ha)	TOTAL	% CHANGE
Untreated urea - 100 kg/ha	100	600	200	900	
DMPP urea - 100 kg/ha [2]	150	600	175	925	2.778
NBPT urea - 100 kg/ha [2.6]	175	675	250	1100	22.22
Active Stabilizer - 100 kg/ha [2.4]	175	700	250	1100	22.22

In today's world, the pressing issue of global warming demands innovative solutions. Nitrogen fertilizers are vital for agricultural productivity, yet they inadvertently contribute to global warming by releasing nitrous oxide, a greenhouse gas nearly 300 times more potent than carbon dioxide (CO₂) and with an atmospheric lifespan exceeding a century.

Active AgriScience nitrification inhibitors (Active STABILIZER PLUS, ARM U 15% DMPP) helps us combat global warming by reducing the amount of nitrous oxide nitrogen fertilizer releases into the atmosphere.

A 2023 nitrous oxide (N₂O) emissions study by the University of Manitoba compared N₂O emissions from urea treated with **Active STABILIZER PLUS** against untreated. **The study showed N₂O emissions were reduced by 23% over 14 days.**

STRENGTH OF GREENHOUSE GASES (100-YEAR GLOBAL WARMING POTENTIAL)

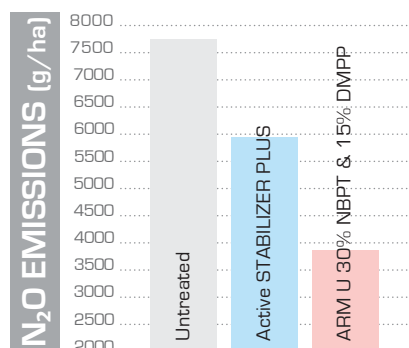


Global warming potential based on 100 year time horizon, Source: IPCC AR5

NITROUS OXIDE EMISSIONS • 2023 • CANADA

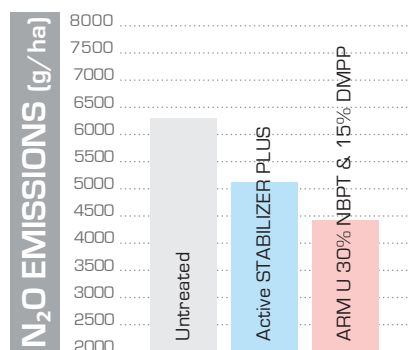


N₂O EMISSIONS from BROADCASTED UREA • 3rd Party Research by the University of Manitoba




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

N₂O 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 AgriScience Inc. DISCLAIMER: Presented data and product attributes will not guarantee the future efficacy and product attributes as these vary greatly related to weather conditions soil types and genetics of crops. It is understood and agreed that Active AgriScience Inc. ("Active") does not guarantee that that use of its Products will yield any specific result. Active's legal liability, and that of its employees or agents, arising from use of its products shall be limited to the cost paid for the product regardless of whether any loss arose from Actives own negligence, breach of contract, or any other cause. Under no circumstance shall Active be liable, beyond the cost paid for the product, for direct consequential, incidental, or special damages, including, but not limited to, damage or destruction of a crop, or contamination of any property.



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CONTACT:

Phil Nixon

PO Box 573, Willetton, WA, 6955

+61 402794288

Phil.Nixon@activeagriscience.com