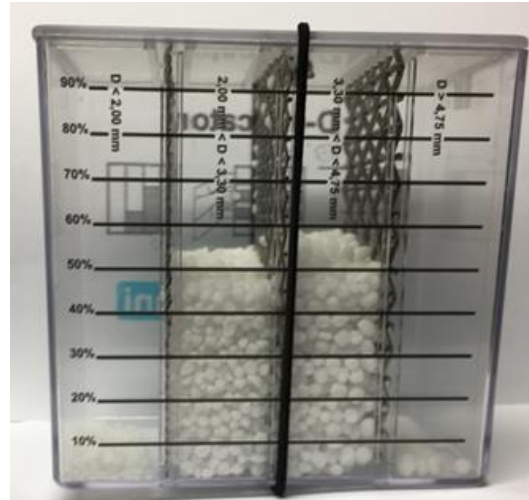


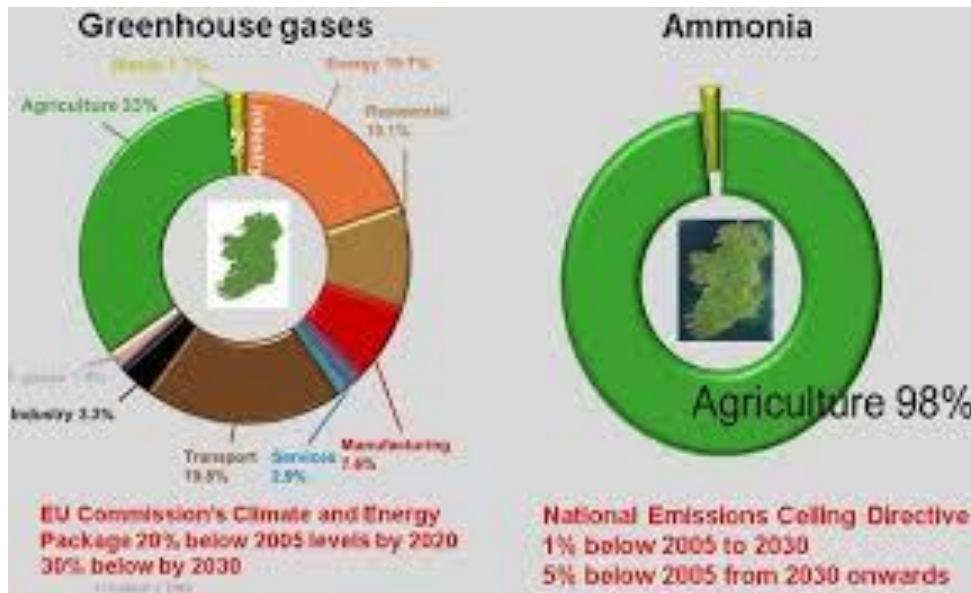


Protected Urea Update & FAQ

**CLIMATE
ACTION
PLAN**



21st February, 2020



Question 1

Can Pro Urea be applied after lime application?



■ Answer

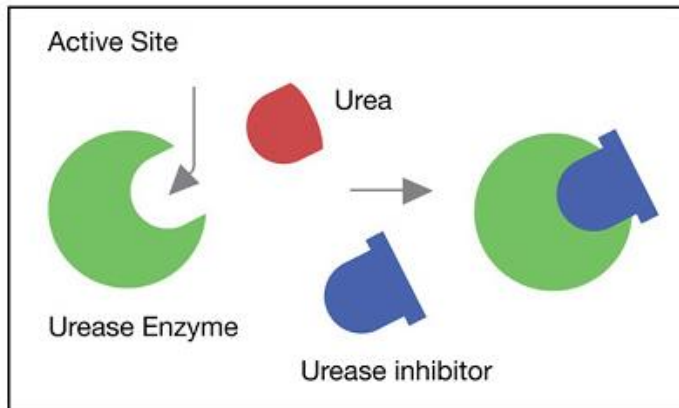
- Initial trials indicate that Pro Urea reduces the risk of N loss through volatilization where lime has been recently applied
- The urease inhibitor controls the pH spike around the urea granule during hydrolysis even in freshly limed soils
- Further trials required
- Leave minimum of 4 to 6 wks after applying lime before following with (straight) urea applications

Question 2

How does Pro Urea work?

■ Answer

- The urease inhibitor stabilises the conversion of Urea to Ammonium (Urea \rightarrow NH_4)
- It protects the N in urea from being lost through volatilization (as NH_3 gas)
- Protects the Urea-N from loss which typically happens during the first 3-5 days after application (period when the Urea granule is melting)



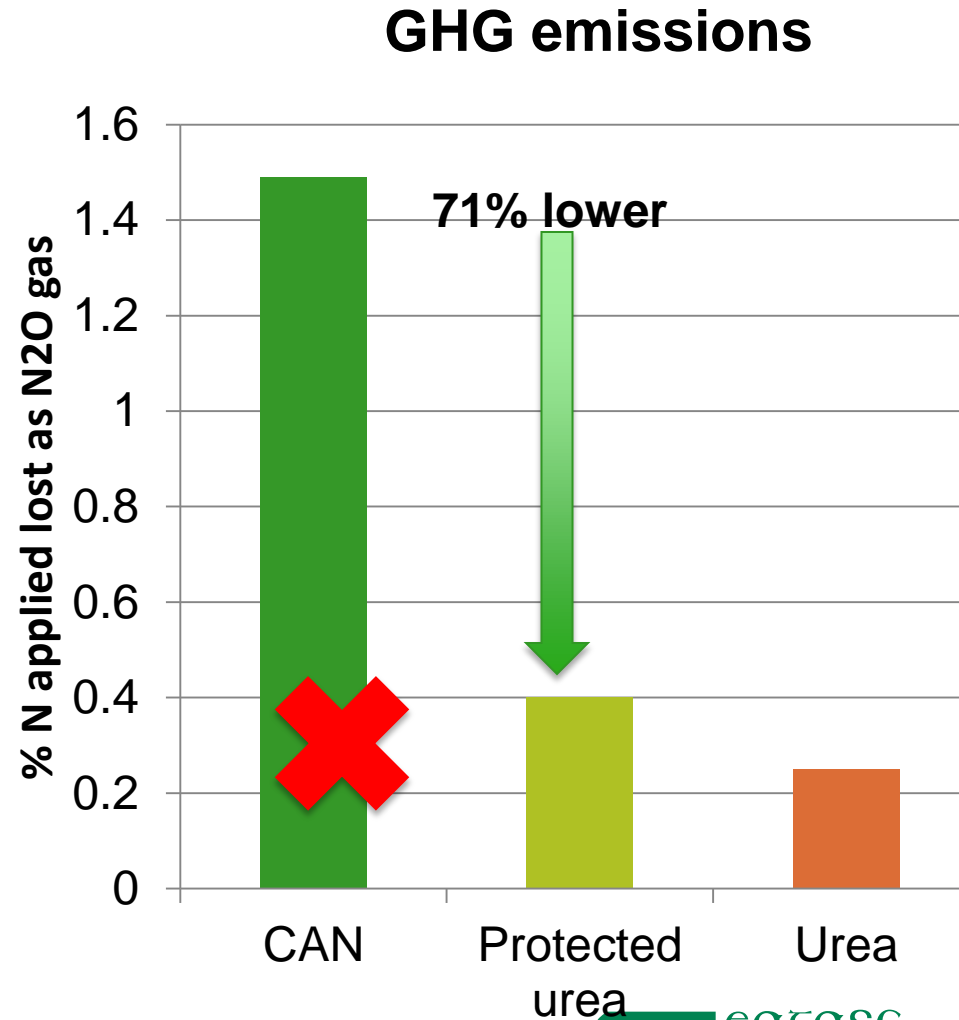
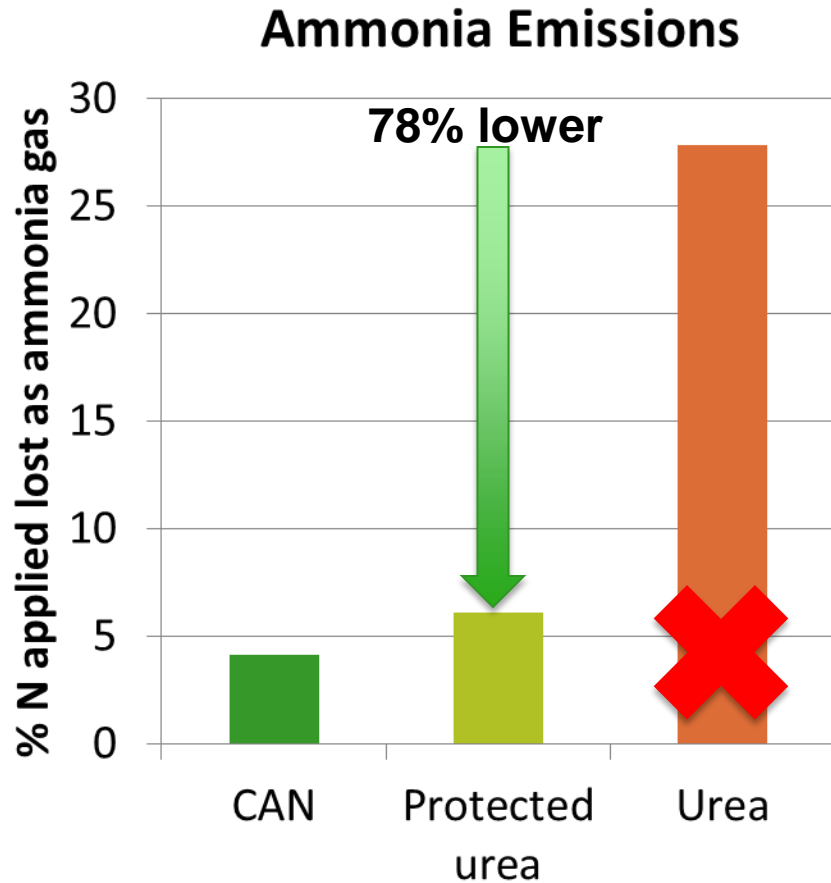
Question 3

Why use Pro Urea for 1st or 2nd round of fertiliser N applications in the spring time?

■ Answer

- In Exp measurements the highest ammonia losses were detected in March (hash, drying conditions)
- Reduces losses N (as NH_3 gas) through volatilization
- Safer form of N (Urea) in terms of leaching / denitrification
- No. 1 technology help Ireland reach ammonia targets
- Low cost and fully verifiable environmental mitigation option

Why Protected Urea? Emissions



MACC – Agricultural GHG Abatement

	Mitigation Mt CO ₂ Eq.	Cost €/t CO ₂ Eq.	
Soil and N management related mitigation options – immediate response			
1. Fertiliser N Type <i>(switch 50% CAN to Protected Urea*)</i>	0.52 Mt	€ + ~4/t CO ₂ e	~1/3
total CO₂ mitigation potential 1	0.52 Mt	Av. total cost € ~4/t CO₂e	
2. Draining wet mineral soils <i>(1/3 poorly drained soils)</i>	0.20 Mt	€ + 16/t CO ₂ e	~1/3
3. Low-emission slurry spreading <i>(trailing shoe)*</i>	0.12 Mt	€ +187/t CO ₂ e	
4. Nitrogen-use efficiency <i>(Liming soils to pH 6.3)</i>	0.10 Mt	€ - 85/t CO ₂ e	
5. Extended grazing <i>(20% grassland area: 250 dry & 149 wet)</i>	0.07 Mt	€ - 96/t CO ₂ e	
6. Inclusion of Clover <i>(25% beef area and 15% dairy area)</i>	0.07 Mt	€ - 7/t CO ₂ e	
7. Slurry amendments <i>(20% slurry treated)</i>	0.03 Mt	€ + 49/t CO ₂ e	
total CO₂ mitigation potential 2-7	0.59 Mt	Av. total cost € 64/t CO₂e	
Animal performance related mitigation options – somewhat slower to be realised			
8. Dairy EBI <i>(increase EBI to €180 per cow by 2025)</i>	0.43 Mt	€ -200/t CO ₂ e	~1/3
9. Improved animal health <i>(20% reduction replacements)</i>	0.10 Mt	€ - 46/t CO ₂ e	
10. Improved Beef Maternal Traits <i>(+€30/cow by 2030)</i>	0.03 Mt	€ -602/t CO ₂ e	
11. Beef Genetics: Optimised live-weight gain	0.06 Mt	€ -215/t CO ₂ e	
total CO₂ mitigation potential 8-11	0.62 Mt	Av. total cost € -1063/t CO₂e	

Question 4

Will protected urea work as fast as unprotected urea or CAN?

■ Answer

- In practical terms YES, why?
- Grass & other crops take up the N applied over several weeks (i.e. all the N is not taken up at once)
- When applied, once the Pro Urea melts, some of the urea will be converted to ammonium (NH_4) feeding the initial grass requirements
- Over time (typically within 10 days) all the Urea will be plant available

Question 5

Will there be a date stamp on protected urea?

■ Answer

- All fertiliser is date coded but no blenders are willing to Date stamp openly
- Currently all fertilisers have a batch code which refers to:-
 - Year of bagging
 - Day of bagging
 - Product ingredients
 - See example of Batch No.



Question 6

Should PPE be worn when handling fertilisers?

■ Answer

In general, suitable PPE should be worn when handling all fertilisers

IRISH FARMERS JOURNAL
Saturday 8 February 2020

FOCUS 57

www.fertilizer-assoc.ie



* Guidelines for the safe handling of fertilisers

It is advisable to take precautions when handling fertilisers.

When spreading protected urea:

- ↻ Protected urea has a different bulk density than CAN or other fertilisers.
- ↻ It is important to recalibrate your spreader for spreading protected urea.

- ↻ A tray test is advisable.
- ↻ Contact your machinery manufacturer for advice on resetting

Safe handling of fertilisers

- ↻ When handling fertilisers, avoid contact with the skin.
- ↻ It is advisable to wear gloves and a



- face mask when using fertiliser.
- ↻ Appropriate eye protection is also advisable.

Issued by The Irish Fertilizer Manufacturers and Blenders Association.

Question 7

What factors do I need to consider when spreading Pro Urea?



■ Answer

1. Density – Urea less dense / lighter (won't travel as far from the spreading disc/veins)
2. More affected by windy conditions
3. 80% of granules 2 to 4 mm in size
4. Important to calibrate your fertiliser spreader
5. Spread up to 18 to 24 meters depending on conditions

Fertiliser Size (mm)		
<2mm	2.00 to 3.3mm	3.3 to 4.75
		

Question 8

Why is Pro Urea not stored for long in bulk?



■ Answer

- Urea is hygroscopic and draws in moisture
- It goes soft with a hard crust in a damp atmosphere etc.
- Urea is treated & bagged relatively quickly after a bulk shipment arrives in Ireland
- Pro Urea will not be available in bulk

Question 9

What is the shelf life of Pro Urea?



■ Answer

- Similar to other products, NBPT has a shelf life and will degrade over time once in storage
- Pro Urea (urea + NBPT) shelf life of 6 to 12 months depending on straight v blended products (see next Q)
- LIMUS (NBPT & NPPT) claims to have a shelf life up to 18 months
- Min. Reg. req. 414 g/tonne

Question 10

How stable is the urease inhibitor when mixed with nutrients such as P, K & S ?

Urea products containing **P** will only give similar performance to unprotected urea

■ Answer

Pro Urea is most stable when bagged as a straight N product

Its stability in storage may differ when bagged with other nutrients as follows;

- + **P**: Not stable / breaks down in days (residual acidity from the P breaks down the urease inhibitor quickly)
- + **S**: Stable but depends on the quality of the ammonium sulphate (if dusty!)
- + **K**: Stable / little impact on urease inhibitor

Question 11

Is Pro Urea available in Co-ops?



■ Answer

- All fertiliser suppliers have a product range on the market.
- Most Co-Op's and Agri merchants sell Pro Urea fertiliser products (ask sales person)
- In some cases the merchant may need to order the Pro Urea for the farmer (should be available within a few days)
- See latest list of Pro Urea's on Teagasc website

Question 12

Some products claiming to be Pro Urea are not on the Teagasc list?

– Do they work & will Ireland get credit?

■ Answer

- Products on the Teagasc list have been evaluated by Teagasc research or have published scientific backing.
- Only use products on Pro Urea list.
- These product will counted by the DAFM for reaching National Ammonia & GHG targets set for Ireland (i.e. Irish agriculture will get credit for these products)

Question 13

Will Pro Urea
impact soil
microbes?



■ Answer

- Initial trial work conducted at Johnstown Castle indicate no negative impact on soil microbes (grassland plots that have received Pro Urea for >6 yrs)
- Trials show positive impacts on soil biological communities compared to controls

Question 14

Will Pro Urea
(urease inhibitor)
effect water quality
or could it transfer
to water?

■ Answer

- No,
- Pro Urea is less likely to be leached through soil compared with CAN
- The urease inhibitor NBPT breaks down very quickly in soil (<<10 days) i.e. low persistency

Question 15

Is there a risk of NBPT entering the food chain?

■ Answer

- International studies indicate no risk
- Further work being conducted by Teagasc (DAFM funded project 2018- 2022) to test soil/grass /milk/meat samples from long term protected urea experiments/farms in Ireland

Question 16

Is NBPT regulated?

■ **Answer** - YES

- By EU - REACH process
- EU Fertiliser Regulations
- Irish Fertiliser Regulations (DAFM)
- Minimum Urease inhibitor inclusion rates set

F.2. Urease inhibitors

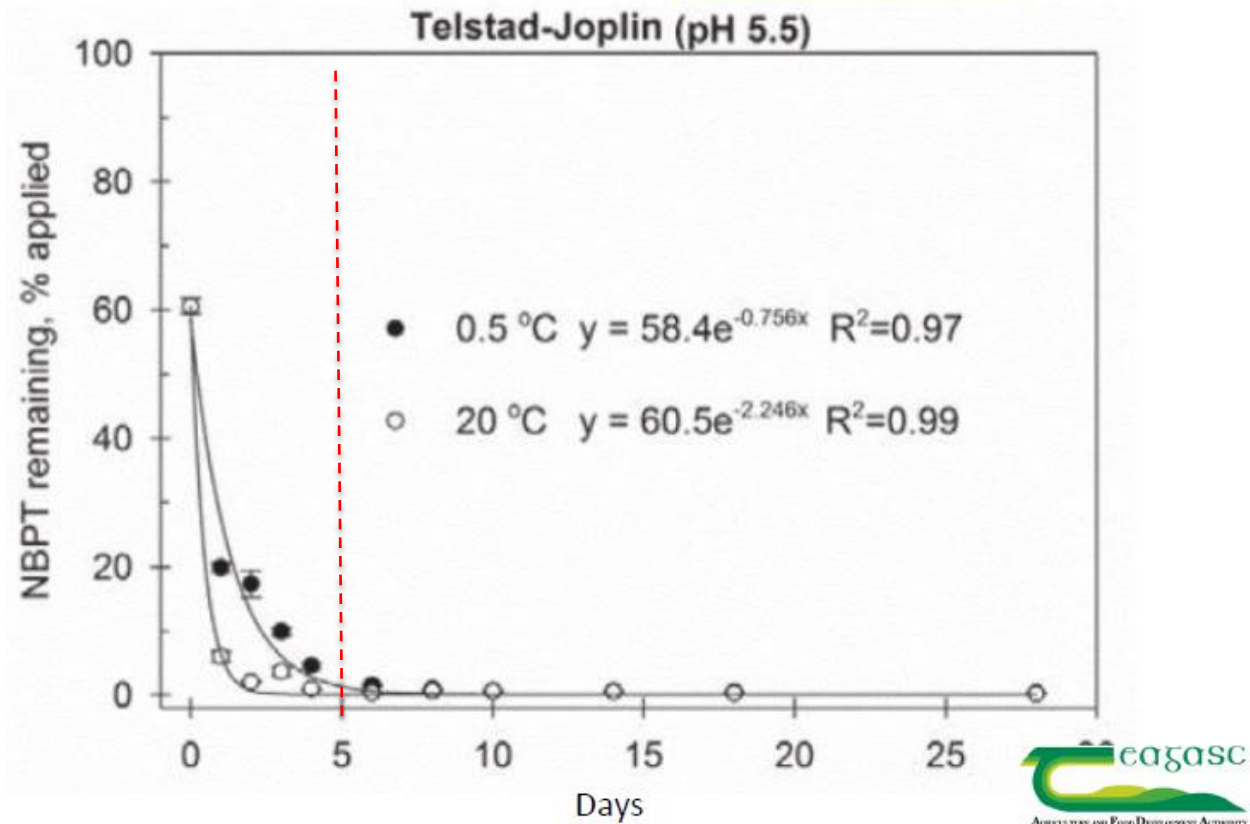
No	Type designation and composition of the urease inhibitor	Minimum and maximum inhibitor content as a percentage by mass of the total nitrogen present as urea nitrogen	EC fertiliser types for which the inhibitor may not be used	Description of urease inhibitors with which mixtures are allowed Data on permitted ratio
1	2	3	4	5
1	N-(n-butyl) thiophosphoric triamide (NBPT) ELINCS No 435-740-7	Minimum 0,09 Maximum 0,20		

Question 17

How quickly will NBPT degrade in the soil?

Answer

Yes, and quickly see [Engel et al., 2013](#)



- For Further Information log onto:-

- www.teagasc.ie/protected-urea

