

## Teagasc Notes for week ending Friday 20<sup>th</sup> March 2020

What is the MACC curve and what it means for you?

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Due to the increase of greenhouse gases (GHG) and Ammonia gasses, the EU has set emission reduction targets for Ireland. The target is to reduce emissions by 30% by 2030 below the 2005 figure of 18.7 million tonnes. If these targets are not met, Ireland will face a substantial financial penalty. Recent figures from 2017 suggest we are emitting 20.2mt and Teagasc projections for 2030 suggest a figure of 21mt, which could be higher or lower, depending on the size of the national bovine herd.

So will we have to cut the national herd to reach our emission reduction targets? The answer is no, as long as we do other things to reduce emissions. Teagasc has been researching methods to reduce emissions and there are now several practical solutions available. These have all been published in a technical paper call the Teagasc Marginal Abatement Cost Curve (MACC), which set out 26 actions that farmers can do across agricultural production. The main farming measures can be boiled down to

1. continued good efficient farming (improving EBI and beef genetic merit, better grassland utilisation and incorporation of clover into grassland, getting soil pH right, etc),
2. switching to a form of urea fertiliser, protected urea, which significantly cuts down emissions of nitrous oxide compared to CAN, and
3. spreading as much slurry as possible in the springtime, and using a low emissions way of spreading such as the trailing shoe or trailing hose.

One of the most effective and fast acting tools that Irish farmers can use to reduce emissions is by using a relatively new product, Protected Urea. As stated by William Burchill at the Teagasc National Dairy Conference 2019 – if Irish farmers can switch 50% of their CAN to protected urea this will offset the GHG emissions of 100,000 dairy cows. This new technology will have a phenomenal effect in allowing us to farm as normal while reducing emissions into our future.

So how does protected urea work? A urease inhibitor (NPPT, NBPT or 2-NPT) is coated around or incorporated into the urea granule. The urease inhibitor stabilises the conversion of urea to ammonium and makes urea safe from potent ammonia-N gas emissions. The urease inhibitor protects the urea-N from being lost which typically happens during the first 3-5 days after application – this is the period when the urea granule is melting.

There has been a lot of excellent research work carried out in Teagasc Johnstown Castle Research Centre surrounding the use of protected urea. It is important that when any new technology comes on the market that we look to proven research to get our information from. Trial work by Teagasc over a 2 year period across 3 soil type sites across Ireland found that protected urea produced the same amount of grass as CAN suggesting that protected urea can be used throughout the year without an impact on grass growth. More importantly these trials also found that protected urea had 71% lower GHG emissions than CAN and 79% lower ammonia-N emissions than urea.

Unlike standard urea, protected urea can be used after the application with lime– which is very important as we know that increasing soil pH on mineral soils to 6.3pH will increase the uptake of nitrogen and other nutrients applied. Initial trials indicate that protected urea reduces the risk of nitrogen loss through volatilization where lime has been recently applied. The urease inhibitor controls the pH spike around the urea granule even in freshly limed soils. The protected urea granule is also less dense or lighter compared to urea. Therefore it is important to calibrate your fertilizer spreader when using protected urea. Generally protected urea can be spread up to 18-24meters.

You can purchase protected urea from varies companies which make a number of different products either as straight nitrogen or mixed with potassium (K) or sulphur (S). Current Teagasc research has

identified that phosphorous is not a stable nutrient to mix with protected urea, and therefore will have to be spread as straight phosphorous or as CAN or urea based product. There is more information available on the Teagasc website regarding protected urea [www.teagasc.ie/crops/soil-soil-fertility/protected-urea](http://www.teagasc.ie/crops/soil-soil-fertility/protected-urea)

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