

## Teagasc Notes for week ended Friday May 3<sup>rd</sup> 2019

### Climate Change – What does this mean to farmers?

As part of the Paris agreement (an agreement between 197 countries aimed at combatting global climate change), Ireland signed up to reducing its greenhouse gas (GHG) emissions by 20% by 2020 and 30% by 2030. As agriculture accounts for one-third of all GHG emissions in Ireland, it was inevitable that agriculture was going to be asked to contribute to the reduction.

The three main greenhouse gasses from agriculture are:

1. **Methane** - From rumen fermentation and slurry storage. Methane is 25 times more potent than carbon dioxide. It accounts for almost 2/3 of agricultural GHGs.
2. **Nitrous Oxide** - From organic and chemical nitrogen fertiliser and excreted N in dung and urine. It is 300 times more potent than carbon dioxide. It accounts for almost 1/3 of agricultural emissions
3. **Carbon Dioxide** - Associated with the use of fossil fuels for energy and the manufacture of fertiliser. It accounts for a relatively small proportion of agricultural emissions. All GHG gases are expressed in terms CO<sup>2</sup> equivalents.

While agricultural GHG emissions are difficult to reduce, farmers who adopt a number of practices and technologies can significantly improve efficiency, improve profitability and lower GHG emissions. Reducing GHG emissions is closely aligned with maximising profitability.

The Teagasc MACC (Marginal Abatement Cost Curve) curve has been widely adopted by industry and farming organisations. It includes many different options to reducing GHG's that when taken on a collective basis, can make the difference in agriculture reducing its carbon footprint and GHG emissions. In other words, there is no silver bullet to reduce GHG emissions but what is needed is widespread adoption of the following key actions through which farmers collectively can make a big impact.

So what are the key mitigation actions that farmers can do to reduce GHG emissions?

1. Changing to Protected Urea  
The use of protected urea nitrogen fertiliser is the largest single avenue currently open to Irish agriculture to meet these commitments to reduce GHG and ammonia emissions. Teagasc research has shown that protected urea has 71% lower nitrous oxide emissions than CAN while production studies show that protected urea consistently yields as well as CAN in Irish grasslands with no difference in annual production between the two fertilisers. Current costs show protected urea to be less costly than CAN while performing just as well in terms of yield and N recovery efficiency.
2. Using low emissions slurry spreading  
As far as cattle slurry is concerned, ammonia is the main gas that we are concerned with. Agriculture accounts for 98% of ammonia emissions in Ireland and the storage, agitation and land spreading of slurry accounts for 75% of this total. The use of Low Emission Slurry Spreading (LESS) equipment such as the trailing shoe have been found to reduce ammonia emissions by between 30-60% compared to splash-plate application. This means that the farmer can also save money on chemical nitrogen as between 60 and 90% of the nitrogen contained in the slurry is retained for grass growth.

3. Improved efficiency

The primary efficiency factors that contribute to reducing GHG emissions include gains in genetic merit of dairy cows (i.e. EBI); improved beef genetics (maternal and terminal traits); extending the grazing season; used of sexed semen as well as improved animal health.

4. Becoming more energy efficient.

We need to improve our energy security by reducing our dependence on imported fossil fuels. At an individual farm level, an investment in renewable energy will reduce the high cost of energy inputs. It will also give a green image to our production that is of increasing importance to the market place.

Agriculture has a very important part to play to help Ireland reach its emission targets commitments. It will take a collective effort by both farmers and the wider agricultural industry to achieve the required targets. Timing is critical as each year that we delay in taking action to reduce emissions will leave a steeper hill to climb as we approach 2030.

