



Knowledge grows

Yara Ireland

Submission:

Draft Interventions for CAP Strategic Plan

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3 September 2021



Introduction

Yara Ireland, which is part of Yara International, wishes to make the following submission in response to the public consultation being undertaken by the Department of Agriculture, Food and the Marine on the draft interventions proposed for Ireland's CAP Strategic Plan 2023-2027.

About Yara International

Yara International (which is headquartered in Oslo, Norway) is a global manufacturer of fertilisers, a supplier of digital and precision farming tools and a provider of agronomy advice to farmers and others concerned with crop nutrition and the sustainable production of food.

Yara's vision is: ***A world without hunger and a planet respected.*** We support climate-friendly crop nutrition and zero-emission energy solutions.

Yara is one of Europe's largest manufacturers of fertilisers from 12 production centres across the continent. In Ireland, Yara supplies high quality nitrogen and complex compound fertilisers (CCF) through our Ireland Team which comprises 10 direct employees and authorised distributors operating from four terminals located at Ringaskiddy, Co. Cork and Roscrea, Co. Tipperary in the Republic of Ireland, and from Belfast and Moira in Northern Ireland.

Submissions

Yara has previously participated in the public consultations on Ag-Climate and on the SEA and Appropriate Assessment for the Food Vision 2030 Strategy. We do not wish to make specific submissions about the structure or levels of Direct Payments under the CAP Strategic Plan for 2023-2027. We will confine our observations and specific submissions to considerations around the role of mineral fertilisers in protecting soil fertility and supporting efficient and sustainable farming systems.

Reducing the Carbon Footprint of Nitrogen Fertilisers

Nitrogen fertilisers are an important input in crop nutrition for both grassland and tillage. The processes used in their manufacture releases nitrous oxide (N₂O) and carbon (CO₂). Reducing these emissions has been a central focus of Yara's sustainability agenda. Yara has developed abatement technologies using high-performing catalytic processes in the manufacture of its nitrate-based fertilisers which have resulted in some of the lowest carbon footprints from fertiliser manufacturing anywhere in the world, and reductions in N₂O emissions by 90%.

Yara has shared this technology, which is now defined as one of the "best available techniques" (BAT) for fertiliser production by the European Union, with other fertiliser manufacturers which is contributing to further significant reductions in the carbon footprint

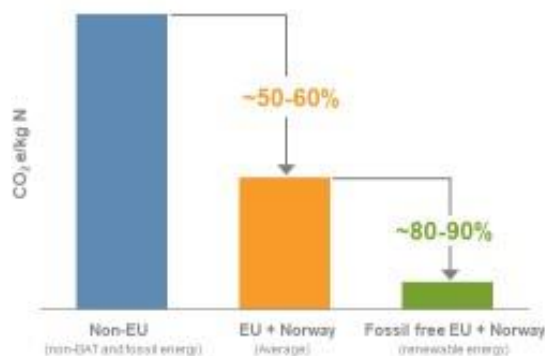
of fertiliser production in Europe, and also for the carbon footprint of the whole lifecycle of crops and grassland grown using fertilisers that deploy these technologies in their manufacture.

Since 2005, Yara has also reduced its direct GHG emissions in Europe by 55% (baseline year 2019). Our objective is to reduce emissions by a further 30% by 2030 (baseline year 2019) which will bring the total reductions in GHG emissions to around 60% versus 2005.

In striving towards our 2050 objective to be net zero, Yara is also piloting the production of mineral fertilisers using renewable energy which will lead to a further lowering of the carbon footprint of nitrogen fertiliser production by 80% to 90%.

Fossil Free Fertilizers have a significantly lower carbon footprint than conventional fertilizers

Carbon footprint N-fertilizer production, CO₂ e/kg N



- Mineral fertilizers produced in EU + Norway already have a significantly lower carbon footprint (~50-60%) compared to most non-EU fertilizers, thanks to the use of the N₂O abatement catalyst.
- This catalytic abatement technology was first developed by Yara and then shared with other providers to reduce emissions during nitric acid production.
- By transforming the production process of ammonia – which is the base of most mineral fertilizers – using renewable energy (solar, wind, hydro) we can achieve a fossil free production process for nitrate fertilizers.
- With this transformation, we expect to reach an additional 80-90% reduction of the carbon footprint of the nitrate fertiliser production process.

The opportunity exists to completely replace fossil fuels with renewable sources of energy in the manufacture of nitrogen fertilisers using Green Ammonia. However, **Green Ammonia is only available in the manufacture of nitrate-based nitrogen fertilisers (such as CAN), and not in the manufacture of Urea which requires CO₂ from fossil fuels in its production.** Urea nitrogen fertiliser also contains CO₂ at a rate of 1.56 kg CO₂/1 kg of urea which is released immediately following its application as hydrolysis starts. This differs from nitrogen applied as CAN fertiliser, which has no embedded CO₂.

Yara submits that the requirements of the Green Architecture that will underpin the CAP Strategic Plan, including requirements of GAECs and SMRs, Eco-schemes and the Pillar II: Agri-Environmental Climate Measures, should reflect 'embedded' carbon in key inputs, such as nitrogen fertilisers, and their impacts on the whole crop production and grassland nutrition life cycle.

Chemical Inhibitors

Current agronomy advice to Irish farmers advocates the use of nitrogen fertilisers that incorporate urease inhibitors which reduce nitrous oxide losses to the atmosphere. This 'chemically protected urea' will potentially introduce an extra 1,208,025 litres of chemical in the form of a urease inhibitor, such as NBPT, which is applied at 3 litre/tonne of fertiliser.

The active ingredients that 'chemically protect' urea fertilisers degrade with time and more quickly in the presence of other nutrients (most notably sulphur and phosphorous). Scientific literature suggests that up to 30% of the soil microbiome produces urease as part of their natural biochemical processes. If biological processes are impacted as a consequence of the addition of 'chemical inhibitors', it could prove detrimental to vital balances in soil microbiology.

Current EU Fertiliser Regulations (2003) require 'chemical inhibitors' to demonstrate effectiveness in reducing ammonia emissions. Revised Fertiliser Regulations (2019) come into force from July 2022 and will set a higher standard for the effectiveness of such 'chemical inhibitors' to reduce emissions of ammonia by at least 20% as measured over the 14 days immediately follow application to the crop or grassland.

Given the reliance that is currently being placed on the effectiveness of 'chemical inhibitors' in the advice being given to farmers on the use of urea fertilisers, it is important that measures are implemented that provide assurances as to their effectiveness in limiting emissions and meeting the new standards required by the new Fertilisers Regulations.

Yara submits that the requirements of the Green Architecture that will underpin the CAP Strategic Plan 2023-2027, including requirements of GAECs and SMRs, Eco-schemes and the Pillar II: Agri-Environmental Climate Measures, should take account of the impacts of added urease inhibitors on soil microbiome and soil fertility, and the effectiveness of inhibitors in reducing ammonia emissions.

Nutrient Use Efficiency

Mineral fertilisers play an important role in crop nutrition of both grassland and tillage crops. The objective in applying mineral fertilisers is to help achieve the optimal balance in the supply of nutrients to growing crops so that applied nutrients are removed in harvested crops or grass grazed by livestock, or remain in the soil to enhance its health and fertility to support the growing of future crops. Losses of applied nutrients to water or the atmosphere are a loss to the crop, to farm profitability and can damage the environment.

It is important that the emphasis for reducing nutrient losses should not be confined to limiting mineral fertiliser usage. Instead, good agricultural practice should seek to improve the efficiency of nutrient use in the growing system. While the two approaches are not mutually exclusive – in fact improvements in nutrient use efficiencies will inevitably lead to reductions in mineral fertiliser usage – focusing on reducing mineral fertiliser use without

considering how farmers can improve their overall nutrient use efficiencies through their grassland management and crop husbandry will undermine production efficiency and profitability without necessarily supporting improved sustainability and environmental protection.

Livestock farming and the production of milk and meat from grassland are our dominant farming activities in Ireland. Yara supports the development of grassland management and husbandry skills towards the greater incorporation of clover and multi-species swards which will play an important role in increasing nitrogen supply from natural atmospheric fixation.

Better nutrient use efficiency also equips farmers to more effectively incorporate nutrients contained in animal slurries and other organic sources (some of which may be imported onto their farms) via nutrient management planning. This will also provide a range of other benefits including higher yields, better crop quality and greater profitability.

Yara submits that the requirements of the Green Architecture that will underpin the CAP Strategic Plan 2023-2027, including requirements of GAECs and SMRs, Eco-schemes and the Pillar II: Agri-Environmental Climate Measures, should support improvements in nutrient use efficiency on farms over the period of the next programme. Requirements in this regard should be administratively straight forward and should not impose additional costs on farmers.

Technology Applications

Technical innovation and knowledge transfer, including agronomy advice and digital services, will assist farmers in achieving greater precision in their nutrient management planning and application of nutrients (including the timing, amounts and location in-field).

Precision Agriculture refers to the use of new technology, such as in-field sensors and satellites, to inform the preferred action that can be taken in-field, improving both fertiliser efficiency at farm level and the impact on the environment by reducing nutrient losses and GHG emissions. Technology will also support farmers in adapting to the increasingly dynamic weather conditions that are occurring because of climate change.

Yara has developed and today provides several technology solutions to assist arable farmers in nutrient management. However, these and other technology tools will become available to support grassland farmers.

- **AtFarm** is an affordable digital tool for farmers to monitor crop growth and create variable-rate application maps based on satellite images. In this way different zones in a field can be fertilised differently according to the yield potential and crop need. Currently, AtFarm covers key crops for the different EU Member States and helps farmers identify areas of their fields that are behaving in an unexpected way. This powerful tool can be combined with existing farm equipment to empower variable

rate fertilisation. It helps to reduce nutrient losses by giving crops what they require at the different stages of the season in different areas of the field.

- **Yara N-Tester BT ('Bluetooth')** (see photo below) - Applying "usual" nitrogen rates from one season to the next can lead to sub-optimal Nitrogen Use Efficiency including potential nutrient losses, additional costs, and lower crop yields. The N-Tester BT helps farmers remove the guesswork in meeting crops nitrogen requirements. The N-Tester BT is a handheld device that determines nitrogen requirements in real-time by measuring the chlorophyll content of the leaf, supporting farmers' nutrient planning.



The Yara N-Tester BT ('Bluetooth')

- **Yara N-Sensor** (see photo on page 7) was developed by Yara in 2000 following many years of field trials and it is the technology behind the AtFarm application. The Yara N-Sensor is mounted on the tractor roof and is directly connected to the fertiliser spreader; it adjusts fertilisation rates instantaneously as nitrogen needs vary significantly across individual fields. Measuring actual crop needs in real-time and adapting fertilisation rates accordingly during spreading is the most advanced form of precision farming available today. The Yara N-Sensor is an optical device. It measures light reflectance from the crop canopy in different spectral ranges with built-in light sources.



The Yara N-Sensor

Yara supports the commitments contained within the proposed outline interventions included in the CAP strategic plan towards knowledge transfer, technical innovations and digitalisation. Yara submits that the prescriptions set out in the Green Architecture that will underpin the CAP Strategic Plan 2023-2027, including requirements of GAECs and SMRs, Eco-schemes and the Pillar II: Agri-Environmental Climate Measures should support and promote innovation at farm level throughout the Programme.

Additional Supporting Information

Yara is committed to constructive engagement and consultation with The Department of Agriculture, Food and the Marine and Irish farmers to help achieve a CAP Strategic Plan 2023-2027 that delivers for all stakeholders.

In response to the public consultation process, Yara has made the following previous submissions:

- Submission on the Agri-Food Strategy 2030 Strategic Environmental Assessment and Appropriate Assessment reports (June 15, 2021).
- Yara's roadmap for putting Europe's Farm to Fork Strategy into action: Reducing nutrient losses, increasing crop yields and producing healthier crops (Yara International, June 1, 2021).
- Yara Ireland's response to the 'Ag Climatise' Public Consultation (January 10, 2020).