2027 SECTORAL ROAD MAP: AGRICULTURE AND THE ENVIRONMENT

Introduction

It has become clear that the environmental footprint of agriculture must be reduced. This entails reducing gaseous emissions, improving water quality and enhancing biodiversity. In Ireland, agriculture has a profound impact on the environment. A huge amount of research has provided us with a good understanding of these impacts, as well as providing an insight into technologies and farming systems which can reduce gaseous emissions, lead to improved water quality, reduce biodiversity loss and improve soil health. While further research is needed, there is now an urgent requirement to improve the implementation of practices that improve environmental outcomes.

The agri-food industry continues to strive for market advantage by demonstrating the sustainability of Irish food through initiatives such as Origin Green. International food buyers are increasingly demanding verification and ongoing improvements of the sustainability credentials of food exports.

Teagasc will place sustainability at the centre of all its programmes by developing and disseminating the technologies needed to make Ireland a world leader in science-based sustainable agriculture and food production.

Environmental research will play a key role in supporting policy formation, developing and promoting sustainable production systems, investigating and developing technologies and practices to improve environmental outcomes, and developing the metrics and evidence base to verify the sustainability of Irish produce. Teagasc will integrate sustainability into all research, advisory and education programmes and will focus on improving farmers' capacity to implement sustainable technologies and practices. Teagasc will support farmers in addressing priorities set in the Programme for Government and EU Green Deal and achieving targets set in the National Climate Action Plan, the River Basin Management Plan and the National Biodiversity Plan. Teagasc will assist farmers to achieve cross compliance and will support farmers participating in agri-environmental schemes and targeted European Innovation Partnerships (EIPs).

Key initiatives to support sustainable farming will be prioritised, such as the Agricultural Catchments Programme, the Agricultural Sustainability Support and Advice Programme (ASSAP) water quality advisory service, the SignPost programme and the development of nutrient management plans (NMP Online).

Gaseous emissions

Achieving reductions in gaseous emissions represents the most significant challenge for Irish agriculture. Ireland has a target to reduce its carbon dioxide (CO_2) emissions by 30% by 2030 compared to 2005 levels and it is essential that agriculture plays its part. Recent growth of the sector driven by increases in the dairy herd and increases in the level of nitrogen (N) usage make the target reductions in greenhouse gases (GHGs) and ammonia extremely challenging.

Actions

The National Climate Action Plan has adopted the Teagasc Marginal Abatement Cost Curve (MACC2) for GHGs as the pathway for achieving emission reductions. Teagasc will focus on delivery of GHG and ammonia mitigation actions by embedding the measures in profitable production systems and by promoting emissions-reducing technologies through all of its advisory and education services. Research will focus on investigating emerging mitigation technologies to reduce emissions (including breeding and feed additives), enhancing carbon sinks through the national carbon observatory, quantifying emissions reductions and mapping a pathway to climate neutrality. Teagasc research will continue to play a key role in informing policy and regulation. Teagasc will roll out the SignPost Farm Programme in conjunction with industry partners to demonstrate best practice in sustainable farming and integrate the key messages throughout all advisory programmes. The advisory service will develop the SignPost advisory programme, working with farmers to reduce emissions and improve the carbon footprint of Irish food. Teagasc ConnectED will faciliate working with all agri-professionals to enable them to influence farmers.

Targets 2027

- To achieve agricultural MACC mitigation targets set out in the Climate Action Bill 2030 (2030 target of 17.5-19MT).
- To reduce GHGs per unit of dairy and beef output by 2% per annum from 2020 to 2027 (cumulative 15% v 2017-2019).
- To reduce national ammonia emissions to 110,000 tonnes (107,000 tonnes by 2030).
- To increase protected urea to 50% of total chemical N use.
- To increase the use of low-emission slurry spreading (LESS) to >75% of slurry spread.
- To establish the SignPost farm network and national carbon observatory.

Nutrient efficiency

Improving nutrient efficiency is essential if Irish farmers are to meet production and environmental objectives. Improved soil fertility management through better planning and implementation of NMPs is a priority.

Switching to the use of protected urea and LESS will increase the proportion of nutrients recovered in farm output, reduce losses to air and water, and reduce the usage and environmental impact of chemical N. A focus will be placed on improving the precision of fertiliser applications in terms of location and timing.

Actions

Research will continue to focus on quantifying crop requirements for macro and micronutrients, on evaluating fertiliser formulations which can deliver positive environmental outcomes, on developing soil-specific nutrient recommendation systems and on maximising nutrient recycling and recovery from organic fertilisers and soil reserves. Research will focus on the further development of Teagasc's NMP Online tool to tailor fertiliser recommendations by pasture productivity and soil type and to broaden its scope to deal with a wider range of environmental sustainability matters. Teagasc Knowledge Transfer (KT) will continue to roll out NMP Online to prepare NMPs to meet agronomic and statutory requirements. The main focus will be on improving the quality of planning and improving the use of plans by farmers through the use of maps and graphics and the development of a farmer app.

Targets 2027

Where stocking rate is >100kg N/ha on mineral soils:

- increase the soil samples above pH 6.2 to 60% on mineral soils;
- increase N use efficiency by 3% and reduce national usage of chemical N in line with national policy (see other enterprise road maps);
- reduce proportion of soil at phosphorus (P) Index 1 to 25%; and,
- 75% of farmers with a stocking rate >100kg N per hectare to have an NMP.

(When aiming for grassland habitat diversity, a lower level of soil fertility is appropriate.)

Water quality

Achieving good or excellent status in 100% of ground and surface water is the ultimate water quality objective. In recent years water quality has disimproved. A collaborative approach involving State bodies, industry and farmers has been initiated to achieve improved water quality. The ASSAP advisors will work with Local Authority Water Programme (LAWPRO) scientists in Priority Areas for Action (PAAs).

Actions

Research: knowledge gaps remain in relation to the pathways, residence times and transformations of nutrients along the transfer continuum to a water body. Primarily through the Agricultural Catchments Programme, research will focus on modelling of environmental and economic impacts of farm practices in relation to water quality, on investigation of the scope for meeting Nitrates and Water Framework Directive objectives, on the development and testing of mitigation measures, and on the development of a toolkit for environmental advice and planning. Advisory services will focus on better nutrient management planning by farmers using NMP Online, on eliminating point-source pollution, on ensuring that cross compliance standards are met and on identifying and reducing losses from critical source areas. ASSAP advisors will work towards achieving water quality improvements in PAAs.

Targets 2027

- Halt the decline in high-status water bodies.
- Increase the proportion of rivers achieving good or high status from 53% (EPA, 2019) to 65% in 2027.

Biodiversity

Protecting and restoring biodiversity and associated ecosystem services has been prioritised in Ireland (Climate and Biodiversity Emergency Declaration) and in the EU with the Green Deal and the EU Biodiversity Strategy. Targets for biodiversity are likely to feature prominently in the review of the Common Agricultural Policy. Recent medium-scale environmental initiatives such as the Burren Programme, the Hen Harrier Project and smaller-scale initiatives supported by EIPs provide points to a more targeted and results-based approach to biodiversity restoration. Achieving improved biodiversity outcomes will require a differentiated approach between intensively farmed areas and extensively farmed high-nature value (HNV) areas.

Actions

Teagasc research will focus on developing sustainable management strategies for HNV farming systems. The development of best practice for the implementation of targeted, outcome-based approaches will be prioritised to inform locally led and national agri-environmental schemes. Multifunctional aspects of multi-species swards will be evaluated. Best practice biodiversity plans will be implemented on all Teagasc farms. The advisory service will support the maintenance of farmland habitats through advice on best management practice, promotion and support of agri-environment schemes and education across all Teagasc KT programmes.

Targets 2027

- Evaluate the benefits (nutrient efficiency, carbon sequestration, greenhouse gases) of multi-species swards.
- Contribute to the restoration of Annex 1 habitats and species to favourable conservation status by 2027 (including the freshwater pearl mussel).
- Improve management of farmland habitats through contribution to targeted national and locally led schemes and KT actions.
- Include biodiversity in the assessment of farm-scale sustainability and preparation of specific plans at farm level to protect and expand habitats.

Soil

Soil is the key resource of farming. The role of farmers in soil protection involves maintaining and improving the capability of soils to perform a multitude of functions including crop production, carbon storage, water purification, nutrient cycling and providing a habitat for biodiversity. Protecting and restoring soil health, particularly soil microbiome and soil structure, is critical to underpin productive and sustainable soil management.

Actions

Teagasc research will focus on sustainable management of land to improve its long-term health and ability to deliver a range of outcomes including productivity, enhanced soil multi-functionality and increased resilience to impacts of climate change. The link between the soil microbiome, productivity and environmental function will be further developed. The advisory service will increasingly integrate soil management into advisory programmes with a particular focus on soil structure, soil biology and soil fertility through NMP Online.

Targets 2027

- NMP online will be enhanced to include soil-specific advice, including soil health.
- Develop a soil microbiome and baseline soil function for agricultural soils in Ireland.
- Develop soil- and management-specific soil health indicators, thresholds and targets.
- Develop farmer-friendly tools to assess soil quality at farm level.

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The road map for Agriculture and the Environment is available on www.teagasc.ie.