Farming for 1.5°

Independent inquiry on farming and climate change in Scotland

From here to 2045

Executive Summary



NOURISH SCOTLAND

NFU Scotland

Thirty Percy

Polden·Puckham Charitable Foundation

ef Esmée Fairbairn FOUNDATION

INTRODUCTION

Farming for 1.5 was established as an independent inquiry in 2019 by NFU Scotland and Nourish Scotland. The intention was to develop a consensus roadmap for farming in Scotland in the context of the climate and nature emergencies, and the Scottish Government's commitment to net zero by 2045.

This can only be achieved if agriculture can become part of the solution, not part of the problem. This means farmers, scientists and environmentalists working together to achieve the changes needed while maintaining food production and sustainable livelihoods for food producers.

The independence of the inquiry enabled all panel members to contribute views freely and develop their thinking collectively, without any pre-determined constraints or no go areas.

Our thanks go to all the panel members who have contributed throughout the inquiry, as well as to all those who have provided the evidence to inform the panel's discussions and underpin their conclusions.

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EXECUTIVE SUMMARY

Doing the same thing next year as we did last year is no longer an option for farmers in Scotland.

The Scottish Government's commitment to net zero by 2045 requires a cut in on-farm greenhouse gas emissions from a baseline of 7.5MtCO_2e in 2018 to 5.3 MtCO_2e by 2032. This is against the background of no fall in emissions for the last ten years. At the same time, farmers must at least maintain per capita food production, and make a living.

It's not just government policy: retailers and processors are committed to cutting their supply chain emissions while meeting their customers' expectations. Behind them stand the banks and investors which increasingly see the nature and climate emergencies as a major risk.

At the same time, The Scottish Government's Statement of Intent for Biodiversity, published in December 2020, underlines the government intention to take action at large to benefit nature and tackle habitat fragmentation. This is a challenge across all terrestrial and marine habitats, and one that needs to be met within the next 10 years, the UN Decade of Ecosystem Restoration.

So, change is inevitable; and farmers need to be in the driving seat, not at the back of the bus.

This report proposes a pathway to 2032 and then to 2045 which supports farmers to deliver the transition. We suggest targets for each of the three key greenhouse gases:

For carbon dioxide we see some efficiency savings in the next ten years, while we prepare for fully decarbonising farm machinery in the 2030s.

For methane we see a reduction of 25% by 2032 through a combination of better animal health, improved genetics, early adoption of feed additives and better management of manures. By 2045 a reduction of 50% on current levels is possible through low methane breeding and widespread adoption of feed additives.

For nitrous oxide we see a reduction of 25% by 2032 through a combination of more efficient use of bagged nitrogen, manures and slurries, an increase in the use of legumes and the reduction of nitrogen use in the large areas of land being farmed for nature.

Nutrient budgeting, yield mapping, crop monitoring, controlled release fertilisers and variable rate application all contribute to nitrogen use efficiency. Further uptake of these measures result in a cumulative reduction of 50% in nitrous oxide emissions by 2045.

In combination, this means a 55% reduction in emissions by 2045. Our proposals also provide for continuing grassland and arable soil carbon sequestration through best practice management, and significant on-farm sequestration in woodlands and wetlands.

For biodiversity, while Government targets are not yet clear, progress towards the vision of Scotland's Environment Strategy (2020) will require managing more land for nature. The direction of travel indicated in the Government statement on biodiversity that 30% of land should be managed for nature will be significant for farmed landscapes.

We have not set out detailed proposals or payment rates for a new farm support mechanism. Phases 2 and 3 below are a form of strong conditionality. Phase 2 – universal greening – is about specific practices to reduce emissions, while Phase 3 – greenhouse gas reduction contracts – is a whole farm approach where businesses choose a change plan which is compatible with a low carbon business model for their holding. At a system level these changes are underpinned by national support for nature-friendly farming, agroforestry and land use planning to get the right trees in the right places.

Our interim report recommended the establishment of a Transformation Steering Group. Scottish Government has committed to establishing an Implementation Board, so we have used that terminology in our recommendations.

The panel agreed a number of principles:

- Nature and climate must be tackled together.
- Everyone has to do something, and there has to be something in it for everyone.
- We need to reduce total emissions from agriculture while maintaining food production per capita, not just reduce the intensity of emissions.
- A high-level, transparent, science-informed climate and nature literate transformation group should be established to co-ordinate activities and policies, drawing from expertise across several fields of expertise in a similar way to the Farming 1.5C enquiry panel.
- Speeding up best practice adoption and innovation requires an informed, explicit, co-ordinated and responsive approach; it won't happen by itself. The advisory service is key, and needs to be rebooted and aligned to the goal.
- There should be targets for individual gases.
- Land use change should be planned rather than left to the market; and should be an inclusive transparent process guided by best available science.

The panel proposes five overlapping phases which all need to start now:

now 2021 2022 2024 2030 2045



Phase 1: Underpinning actions

Phase 2: A farmer's mitigation menu

Phase 3: System change to low emission production

Phase 4: Whole farm system change

Phase 5: Land use change

Approach	Examples	Timeline
Phase 1: Underpinning actions	Theory of change Improved baseline data New contract for advisory services Plan for better data capture and use Develop universal calculator Stronger links to research	Immediate start, updated baseline in place by end 2022
Phase 2: A farmer's mitigation menu	Nutrient budgeting and use of controlled release fertilisers Slurry injection Legumes/ intercropping Manure management Livestock health Feed management Genetic improvement of ruminants	To be part of Universal Greening requirements from 2022
Phase 3: System change to low emission production	Choice of approaches 'precision' or 'nature value' - to ensure all sectors and farm types can contribute through a low carbon pathway.	Pilot projects start as soon as possible to inform design. Contracts to be required as part of post 2024 policy
Phase 4: Whole farm system change	Increase diverse approaches to support biodiversity and multifunctional landscapes Agroforestry Organics, agroecology, regenerative farming	Pilot projects start now under both agricultural and forestry schemes to inform post 2024 agricultural and future forestry policy
Phase 5: Land use change	Right trees in right places – planned approach to land use change, encourage integration of farming and forestry Restoring peatlands and wetlands	Implement public interest test now to control investor-led afforestation In 2022 revisit forestry strategy to develop science-based approach to land use planning

List of recommendations

1 The Implementation Board's approach must be grounded in an explicit theory of change, which they refine and develop over time.

2 The Board should institute a scheme for continuing professional development for farmers. The new contract for advisory services should involve a re-focusing of the service on working with farmers to tackle the climate and nature emergencies; and an emphasis on reaching the full diversity of farmers through flexible and inclusive 'one to few' approaches. This enhancement of CPD and refocussing of advisory services should be reflected in formal training provision for new entrants too.

3 The Board should ask SEFARI and RPID to work with existing generic initiatives such as the Digital Transformation Service and the Data Lab, relevant AgtriTech Innovation Centres and Region and City Deals, and agree a plan for improving the use of data at farm, region and national level to support and monitor the sector's transition to low-carbon farming.

4 As part of the Green Recovery[1] priorities under "boosting youth employment opportunities in nature and land-based jobs", Scottish Government should fund a programme of training and employing young people to undertake soil carbon testing and mapping of on-farm natural capital.

5 The Board should invite costed proposals from existing providers for developing a 'universal' farm-level calculator with greater functionality. The data from the universal calculator would be in the public domain, and there would be an independent board including farmers and scientists to oversee further development. This recommendation should be integrated with Recommendation 3.

6 The Board should establish a farmers' advisory panel to act as a reference group for the Strategic Research Programme. Scottish Government should continue to invest in the Rural Innovation Support Scheme.

7 Scottish Government should introduce the mitigation menu as soon as possible, to replace the existing greening scheme with the expectation that all farms sign up to the baseline requirements and a number of options.

8 From 2024, Scottish Government should introduce emissions reduction contracts across all farm types underpinned by a management plan that fits their system and its future development, with a limited number of management interventions.

9 Scottish Government, farmers and research institutes should work together to accelerate advances in ruminant livestock selection and breeding; include reducing methane emissions in breeding goals, and encourage uptake of best practice.

10 Scottish Government should set a target of 6,000 hectares a year for agroforestry creation, and create a ring-fenced budget for agroforestry with a dedicated 10-year programme to drive it.

11 There should be a public interest test applied if more than 50% of a holding is planned to be afforested.

12 Forestry applications over 20 hectares should be required to specify the net carbon sequestration they will achieve over the next 50/100 years, and demonstrate biodiversity net gain.

13 Land use change should as far as possible be planned to optimise economic environmental and social outcomes rather than be purely market-driven.

14 Regional land use planning groups should be supported by large-scale modelling as described in the Research Strategy for Environment, Natural Resources and Agriculture so they can make informed decisions and recommendations.

15 The carbon in Scotland's soils should not be traded until further notice.

The transformation requires unparalleled investment, led by government and supported by the whole supply chain; in advice, in research, development, innovation and translation to practice, in kit and in data – but most of all in people.

Some farmers in Scotland are already delivering on best practice and experimenting in these new areas. What will make our net zero and biodiversity targets achievable is leaving no-one behind – making it easier for everyone to adopt best practice and for more farmers to innovate. This is a social and cultural challenge as well as a technical one.

Tackling the nature and climate emergencies is not just about farming better. It's about redefining the role of farmers, with delivering for nature and climate on an equal footing with producing food. Stewardship has to be seen as a core professional and business value.