



Delivering Our Future, Valuing Our Soils: A Sustainable Agricultural Land Management Strategy for Northern Ireland

Executive Summary

Expert Working Group on
Sustainable Land Management

Executive Summary and Recommendations

The Agri-Food Strategy Board's "*Going for Growth*" set ambitious targets for Northern Ireland's agri-food sector, including a target for a 60% growth in sales by 2020. It specifically recommended the development of a strategic land management policy and emphasised that agricultural productivity must be considered in parallel with the need for our agri-food industry to maintain and enhance environmental performance.

An independent Expert Working Group was established in 2014 with members from the agri-food, environmental and government sectors. Their aim was to produce a Sustainable Agricultural Land Management Strategy for Northern Ireland which would outline how the ambition of "*Going for Growth*" would be achieved in a way which improved farm incomes and environmental performance simultaneously.

The Group believe this report, as an output of their work, is now ideally timed. Farm incomes have now reached critical levels and Northern Ireland's agri-food sector still needs to improve its performance in key environmental focus areas such as water quality, emissions and biodiversity. The recent merger of the Department of Agriculture and Rural Development and the Department of the Environment warrants a fresh look at policy development and regulation. Therefore we believe that now is the perfect time for an innovative approach, one which can fulfil our dual ambition for good economic performance and improved environmental outcomes.

Our initial findings identified a series of issues in the way agricultural land is managed, which must be addressed:

- Our grass utilisation is significantly below optimal levels
- Less than 10% of our farmland has an up-to-date soil analysis
- 64% of our soils are not at optimum pH
- Almost 30% of agricultural land is let in Conacre, a short term arrangement which denies tenants security in their land tenure and therefore impedes long term planning

Alongside the above, significant improvements in environmental performance are also needed since:

- 63% of NI water bodies are not achieving the "Good or better" status required by the EU Water Framework Directive, despite improvements in nitrogen and phosphorus efficiency on farms
- Only 1 of Northern Ireland's 49 European Priority Habitats is at favourable status
- Agriculture is responsible for 28% of total NI Greenhouse Gas emissions
- The long term decline in populations of farmland species of plants and animals continues

To achieve sustainable land management in Northern Ireland, this strategy calls for a culture of behavioural change created by the provision of personalised information to empower farmers through measuring and managing the performance of their land. We want to see changes in how government regulates and advises farmers on the environment. Too many farmers associate the environment with regulation and penalties leading to a culture of fear. We want farmers to recognise that so much of what is good for the environment is also good for farm businesses and that the environment can be a profit centre and not just a cost centre. We strongly believe that government should take an “advocacy first” approach to improving environmental management on farms. Providing advice and guidance to farmers on how to correct environmental issues should be the initial priority with regulation and enforcement undertaken only where they are needed.

Improving the health of Northern Ireland’s agricultural soils is the central focus of this strategy. Healthier soils will deliver better yields of crops and grass which are higher in quality. This will provide the raw material necessary for the increased productivity and profitability envisaged by ‘*Going for Growth*’ and will also deliver environmental improvement simultaneously.

This strategy, if fully implemented, has the potential to positively transform the economic performance of our livestock sectors. Supported by the roadmap we have laid out, it is well within the capability of our grassland farmers to increase their grass utilisation by at least one tonne of dry matter per hectare and to also make improvements in grass and silage quality of 5 to 8%.

As an Expert Working Group we recognised the need for independent validation of the economic and environmental impact of such improvements. We therefore engaged the Agri Food Biosciences Institute (AFBI) to examine what achieving these targets would mean for our main grassland enterprises. The results are summarised in the tables below:

Dairy Sector	Current Average Non-Derogated Dairy Farm Performance	Current Average Farm, utilising 1 extra tonne of average quality Dry Matter of Grass, per hectare	Current Average Farm, utilising 1 extra tonne of good quality Dry Matter of Grass, per hectare
Whole Farm P. Balance (kg P/ha/year)	11.3	4.2	3.0
Change in N concentration in land drainage water	N/A	+ 2 mg nitrate-N/l	+ 3 mg nitrate-N/l
Net Change in Profit if Milk price is 18p per litre	N/A	+ £120 / ha / year	+ £279 / ha / year
Net Change in Profit if Milk price is 28p per litre	N/A	+ £45 / ha / year	+ £334 / ha / year

Beef Sector	Current Average Non-Derogated Dairy Farm Performance	Current Average Farm, utilising 1 extra tonne of average quality Dry Matter of Grass, per hectare	Current Average Farm, utilising 1 extra tonne of good quality Dry Matter of Grass, per hectare
Whole Farm P. Balance (kg P/ha/year)	1.93	2.03	0.69
Change in N concentration in land drainage water	N/A	+ 2 mg nitrate-N/l	+ 3 mg nitrate-N/l
Net Change in Profit if Beef Price is 280p / kg	N/A	+ £115 / ha / year	+ £137 / ha / year
Net Change in Profit if Beef Price is 380p / kg	N/A	+ £171 / ha / year	+ £204 / ha / year

The results of this analysis are clear; improving our grass utilisation and quality will mean substantially greater profits for the farmer and significantly lower phosphorus balances on farm. It is vital to our future prosperity that Northern Ireland takes the steps necessary to ensure that we reap these rewards.

The first step towards implementing our strategy is to build a detailed baseline of current productive and environmental performance. Therefore we are recommending that:

- A publicly funded GPS soil sampling and analysis survey of all agricultural land is undertaken with results provided directly to farmers. Support should be provided to translate the soil analysis results into a four year nutrient management plan
- A full aerial LiDAR survey of Northern Ireland is undertaken so that water quality interventions can be targeted with precision and that the carbon sequestered by above-ground biomass can be quantified credibly
- Real-time water quality monitoring should be established in 60 – 80 catchments with farmer discussion groups being established in these areas to deliver water quality improvement while improving farm profitability
- A central database is established to collate all the results from the above along with accessing other relevant information, such as Tellus data and the positioning of priority environmental habitats
- An online cloud-based decision support tool should be developed to give farmers access to the comprehensive personal data relating to their land, informed by the baseline information held in the central database

Healthy soils require good management to ensure that our farmland delivers its potential for greater profitability and better environmental performance. Improved soil health will be achieved by:

- The appropriate application of lime to optimise the pH of agricultural land in Northern Ireland
- Prioritising fields at lower phosphorus (P) levels for nutrient application
- Precision application of nutrient within fields using GPS technologies
- A significant increase in the proportion of slurries and manures applied using efficient methods such as trailing shoe, band spreading or shallow injection
- More analysis of slurries and manures to complete the calculation of correct nutrient application rates
- Research into whether slurries and manures can be treated to allow safer and more biosecure redistribution between farms
- Research into whether technology such as soil potentiometers and thermometers can facilitate the application of nutrient by soil conditions, rather than calendar date
- Capital support to separate P from slurries and manures on farms which cannot sustainably spread their nutrient to land

An obvious question for the Expert Working Group to address was;

What does sustainable land management look like on a farm in Northern Ireland?

We believe that the key features of sustainable land management are:

- Achieving sustainable profits per hectare
- Good nutrient management leading to greater utilisation of higher quality grass and silage
- Production of more diverse swards with greater proportions of legumes to help extend the grazing season while improving soil structure, carbon and biology
- Properly located woody riparian strips in overland flow pathways to reduce nutrient and sediment loss to waterways to improve biological water quality
- Woody biofiltration blocks, placed downhill of farmyards and at discharges to septic tanks to capture “grey water” and reduce the risk of nutrient leakage
- Appropriate agro forestry planting on grassland farms to extend the grazing season while improving biodiversity and carbon sequestration and providing renewable fuel

- Woodland barriers between farms to improve biosecurity and herd health while increasing biodiversity and carbon sequestration
- Strategic planting of trees around intensive livestock units to reduce ammonia drift resulting in nitrogen deposition on sensitive environmental sites

Although not all of these measures will be appropriate or necessary on every farm in the short term, we strongly believe that if every farm could implement some of the measures above, then the sustainability of agriculture and the environment would be greatly improved.

To achieve these positive outcomes, a culture must be created whereby farmers have the confidence to implement these sustainable land management practices.

To assist such a culture, we recommend that:

- Environmental governance is delivered using the principle of “advocacy first.” This will probably require separating the task of providing environmental advice and guidance to farmers from the regulatory role of cross-compliance or similar inspections
- Following clarification by the HRMC that land let under a tenancy in Northern Ireland will qualify for Agricultural Property Relief, a fiscal incentive should be introduced to voluntarily encourage farmers and land owners to move away from our eleven month conacre system and towards long term leases of at least five years
- Mentoring should be provided for effective farm succession planning
- Farmers seeking an opportunity to enter the industry should be able to access landowners and farmers willing to provide such opportunities

We believe that implementation of this strategy will be successful if:

- The trust of farmers and land managers is secured up-front
- Policy makers and the food chain, and not just the farming community alone, play their part in implementation
- The strategy is not ‘cherry picked’ with vital aspects disregarded
- Any phased implementation begins with Business Development Groups, Water Catchment Discussion Groups or interested significant landowners before being rolled out to the rest of the industry
- The correct choreography of implementation is followed with nutrient processing solutions for intensive farms provided before the GPS soil sampling and analysis survey
- A credible science-based sustainability brand for NI food is established
- Regulation is properly targeted and protects the responsible and proactive farmers whilst, if necessary, penalising the inactive

- Implementation is supported by a comprehensive advisory programme encompassing the public, private and voluntary sectors
- Environmentally positive farming becomes a profit centre, not a cost centre

We recognise that our report contains a lot of “big asks” for farmers, regulators and policy makers. Implementing change is not always comfortable but we are convinced that it is necessary. Achieving behavioural change in sustainable land management is subject to two over-riding principles:

1. We must measure first to be able to subsequently manage optimally
2. We must make it easy for farmers to do the right thing

To conclude, we believe that this a strategy which offers something for everybody:

- For farmers, increased resource efficiency and more utilisation of grass for greater profit
- For agricultural entrants, more opportunity to access land
- For the environment, improved soil health and fertility, improved water quality, reduced nutrient losses to water, reduced ammonia loss to air, increased carbon storage and more habitats rich in biodiversity
- For processors, a commitment to sustainability which will positively differentiate and seek better value for Northern Ireland food
- For retailers, a transparent and auditable way to assure their consumers that agriculture is delivering on its environmental responsibilities.
- For government, a baseline and a means to achieve its dual commitment to improve farm profitability and meet environmental targets through an efficient and sustainable agri-food sector that drives wider economic growth
- For consumers, assurance that the local food they eat is being produced transparently and to best in class global standards
- For taxpayers, an assurance that their money is being targeted and spent efficiently
- For everybody, the increased wealth and respect created by international and domestic recognition of best in class global standards in land management and food production within Northern Ireland

List of Expert Working Group's Recommendations for Sustainable Land Management

1. Building a Baseline

- a. Complete GPS soil sampling and analysis in Northern Ireland's fields at 2 hectare intervals.

Indicative Response: Approximately 400,000 soil samples, predominately in 2 hectare blocks across Northern Ireland

- b. Conduct a full LiDAR scan of Northern Ireland to pinpoint areas of overland flow of water and measure above ground carbon sequestration in biomass.
- c. Establish an enhanced regime of water quality monitoring on 60-80 of Northern Ireland's 450 river catchments.
- d. Create a Sustainable Land Management Decision Support Tool for farmers, supported by a transparent and comprehensive database on soil, water, biodiversity and land use for the provision of personalised information for each farm in Northern Ireland, thus empowering farmers to deliver more positive behavioural change.

2. Managing Soils More Effectively

- a. Use liming as appropriate to optimise the pH of agricultural land in Northern Ireland.

Indicative Response: 6 tonnes per hectare of lime on 512,000 hectares of grassland

- b. In the short term, communicate the availability of a ready reckoner for assessing the dry matter and nutrient content of slurry. In the medium term, we recommend the development of an accessible, rapid, low cost analysis system for slurries and farmyard manures.
- c. Provide appropriate mentoring to encourage farmers to match nutrient application to soil P index and crop need.

Indicative Response: 500 Variable Rate Lime and Fertiliser Spreaders operating throughout Northern Ireland

- d. Take measures to significantly increase the proportion of slurry which is applied on land by trailing shoe, band spreader or shallow injection.

Indicative Response: By 2020, 80% of slurry and manures are spread by trailing shoe, band spreader or shallow injection

- e. Optimise nutrient application by ensuring that farmers can access financial support and training in the use of appropriate technologies, such as variable rate spreaders.
- f. Commission research into the viability of using technology for nutrient application based on soil conditions, rather than calendar dates.
- g. Maximise the use of local nutrients by simplifying the administrative burden of moving slurries and manures between farms to ensure that it is as straightforward as possible.
- h. Investigate the potential for bio-secure redistribution of slurries and farm manures by conducting research into treatments and creating a risk matrix for such transfers. If this is successful, establish a slurry redistribution scheme to increase the proportion of slurries being sustainably redistributed.
- i. Provide capital support for nutrient reprocessing on “High P” farms.

Indicative Response: 500 transportable centrifuges or equivalent operating throughout Northern Ireland

3. Producing Improved Results

- a. Use a variety of grassland management techniques to increase grass utilisation on Northern Ireland farms by at least one tonne per hectare per year and improve grass and silage quality by achieving a 5 - 8% increase in ME (metabolisable energy) content. These goals can be achieved by:
 - i. Reaching optimal soil fertility
 - ii. Ensuring that regular reseeding is undertaken across NI’s grassland resource (20% of rotational grasslands and 5% of permanent grasslands annually.) However reseeding is not recommended for designated species rich grasslands or grassland on high organic soils
 - iii. Applying Sulphur to all silage swards in the Spring
 - iv. Entering into dialogue with local silage contractors on the optimal method of charging to ensure better quality and utilisation of grass
 - v. Prioritising increased grass utilisation in soils of P Indices 3 and above to accelerate “mining” of Phosphorus from high P soils

- vi. Increasing the uptake of grass measurement, both manually and using best techniques in forage harvesters linked to GPS yield mapping.
- vii. Choosing the right grass/clover mixes.

Indicative Response: Reseed 30,000 hectares of temporary grassland and 27,500 hectares of permanent grassland every year

- b. Farmers should grow more diverse swards and consider greater incorporation of legumes, such as clover. Where clover is established in swards, farmers should be targeting clover content of 30% in the Dry Matter.
- c. Target water quality interventions on at least 4,000 ha of land by establishing:
 - woody riparian strips in overland flow pathways; and
 - woody biofiltration blocks downhill of farmyards and at discharges to septic tanks
- d. Farmers should incorporate trees appropriately within productive farming systems, to include at least:
 - 5,000 hectares of Agro-forestry across Northern Ireland
 - 1,000 hectares of biosecure woody corridors, targeted in areas of high risk for livestock disease
 - 1,000 hectares of trees sited around intensive livestock units
- e. Ensure that sustainable and flexible management plans are in place for upland areas which recognise the importance of achieving stocking levels which benefit both the farmer and the environment simultaneously and receive appropriate financial support.

4. Enabling Achievement

- a. Review current environmental governance structures and implement an “advocacy first” approach to environmental governance whereby the chosen “advocate” is not responsible for regulating the cross-compliance or any similar regime.
- b. Introduce a fiscal incentive which encourages farmers and land owners to move away from conacre and towards long term leasing.
- c. Support the UFU and Young Farmers’ Clubs of Ulster as they establish a Land Mobility Scheme for Northern Ireland.
- d. Provide a mentor on succession planning to farmers to broker conversations. outline the key elements of succession and signpost professional advice.

5. Implementing the Vision

- a. Government and the agri-food supply chain should work in partnership with farmers to implement this strategy. A change in the culture of environmental advocacy and regulation and support for nutrient processing schemes should be prioritised.
- b. Farmers must not be asked to implement this package on a partial basis. Phasing of implementation should begin with Business Development Groups and Discussion Groups within Water Catchments, as well as interested significant landowners who wish their land to participate.
- c. The Agri Food Strategy Board and Food NI should develop a sustainability brand for Northern Ireland based on a credible and science-based approach to land management.
- d. Develop a comprehensive advisory programme on Sustainable Land Management by training the public, private and voluntary sector advisors through an accredited course and qualification. These advisors will then roll out the programme to farmers.
- e. Identify sufficient funding streams to enable implementation of our recommendations and therefore achieve international recognition for Northern Ireland as a place of environmental innovation and global best practice in land management.

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