AGRISEARCH RESPONSE TO THE DAERA CONSULTATION ON: NUTRIENTS ACTION PROGRAMME 2026-2029

Contents

List of Tables 5
List of Figures 6
EXECUTIVE SUMMARY 7
INTRODUCTION 9
CONSULTATION PROCESS 11
Lack of Stakeholder Engagement 11
Consultation Documentation 12
Clarity of Proposals and Assumptions Made 12
Consultation Events 13
Lack of a Full Economic Impact Assessment 14
SCIENTIFIC EVALUATION 15
Introduction 15
Water Quality Data 15
Long term trend analysis 15
New Proposed Measures 17
Water Protection: intercepting/breaking nutrient pathways 17
Uncultivated buffer strips in arable fields 17
Stacking of Silage Bales 18
Additional Phosphorus Controls 18
Further restrictions on the use of chemical fertiliser containing P 18
Farm phosphorus balance limits for "intensively stocked" farms 19
Nitrogen Fertiliser 21
Prohibition of the use of granular urea fertilisers that do not contain a urease inhibitor 21
Chemical N fertiliser limits (NF2) 22
Allowances for processed organic fertilisers 25
Mandatory liming 25
Appendix 1. Critique of DAERA's estimate of the proportion of P surplus in NI which can be attributed to the agricultural sector. 26
Appendix 2. A Scientific Evaluation of the AFBI Paper '*AFBI Scientific Evidence Contributing to N Fertiliser Limit'* posted on the NAP Consultation website on 20 June 2025 27

Appendix 3 Impact of proposed reductions in maximum chemical fertiliser N levels for silage swards. 40
LACK OF JUSTIFICATION OF THE CASE FOR RADICAL CHANGE 41
INTERIM ECONOMIC IMPACT ASSESSMENT OF PROPOSED MEASURES WITHIN DAERA'S NUTRIENTS ACTION PROGRAMME 2026 – 2029 43
Foreword 43
Executive Summary 45
Methodology 46
Sectoral Impacts 49
Pig farms 49
Poultry farms (Layers) 50
Beef and Sheep 51
Mixed farms 57
Dairy Farms 58
Milk yield 59
Arable, Potatoes and Vegetables 61
Other Considerations 62
Land Impacts 62
Borrowing Commitments of Northern Ireland Farms 62
Conclusions 64
Appendix A - Phosphorus (P) balance 65
Appendix B - Farm business type and size 66
Appendix C - Use of Gross Margins 67
Appendix D - Use of Multipliers 68
Appendix E - Standard outputs coefficients 69
Appendix F - Standard labour requirements coefficients mapped to DAERA coefficients 70
AGRISEARCH DETAILED OBSERVATIONS ON PROPOSED CHANGES TO THE NUTRIENTS ACTION PROGRAMME 71
Water Protection: intercepting / breaking nutrient pathways 71
Uncultivated buffer requirement 71
Arable land 72
Storage of Silage Bales 74

Reduction of maximum value of slurry that can be applied at the shoulders of the season 76
Additional Phosphorus Controls 76
Further restrictions on the use of chemical P fertilisers on grassland 76
Introduction of a Farm Phosphorus Balance limit for more intensively stocked farms 80
Review of Standard Values for calculation of Nitrogen and Phosphorus 90
Dairy Cow N excretion rates 90
Dairy Cow P excretion rates 91
Updated standard values for separated manures and slurries 92
Nitrogen Fertiliser 92
Prohibiting the use of granular urea fertilisers unless they contain urease inhibitors 92
Review of Chemical Nitrogen Fertiliser Limits 94
Introduction of an allowance / limit for fertilisers derived from processed livestock manures 99
Introduction of a mandatory liming programme 99
DEROGATION 101
Technical Amendments 103
Information system for slurry spreading conditions 104
Anaerobic Digestate Measures 106
Focused approach for high-risk areas and sensitive sites 107
Alternative Approaches 109
IMPACT ASSESSMENTS 111
Strategic Environmental Assessment 111
Environmental Risks 111
Need for a further Strategic Environmental Assessment 116
Regulatory Impact Assessment 116
Equality Impact Assessment 118
Rural Needs Impact Assessment 118
CONCLUSION 120

List of Tables

Table 1 Effect of fertiliser N level on herbage production (average of reseeded and permanent swards) Hopkins et al (1980) 4 weekly cutting, average of three years across reseeds and perm pasture 28
Table 2 Effect of fertiliser N level on herbage production (average of reseeded and permanent swards) Hopkins et al (1980) 8 weekly cutting, average of three years across reseed and perm pasture 28
Table 3 Hillsborough Data – Response to chemical N fertiliser level. 29
Table 4 Grass dry matter yield at each site for N rates 0 to 500 kg/ha. N rates were applied in five equal split applications during the grazing season 29
Table 5 Mean annual (three cuts) total grass dry matter (DM) yield (t/ha) in response to N fertiliser rate, [for] pelletized and ground lime combined. [b] 30
Table 6 Average of 2008 and 2009, when no manure N was applied..... 31
Table 7 Total grass dry matter (DM) yield (t/ha) in response to N fertiliser rate (Cardenas et al 2019) 32
Table 8 Herbage production results: grass yield, N offtake and N content of herbage. Standard errors (s.e.d.) are also provided. (Cardenas et al 2019) 32
Table 9 N Fertiliser application per experimental site and timing of application (AFBI unpublished research (Project 8)) 34
Table 10 Mean total annual DM yields (t SM/ha/yr) per N rate, at each experimental site in 2022, 2023 and 2024 (AFBI unpublished research (Project 8)) 35
Table 11 Published studies – DM yield at zero N fertiliser 35
Table 12 Overall herbage yield response to N fertilizer (2022-2024) across 8 sites (Project 6 Unpublished study) 36
Table 13 Breakdown of Financial Impact per sector (per annum) on implementation of the 10kg/ha and 8kg/ha Phosphorus balance and buffer strips 45
Table 14 A breakdown of farms sampled in the DAERA Farm Business Survey (2023) compared with the sample surveyed 46
Table 15 Breakdown of distribution of pig farms surveyed 49
Table 16 NI Pig Sector Gross Margin 49
Table 17 Impact of P Balance Limits on NI Pig Sector 49
Table 18 Breakdown of distribution of layer farms surveyed 50
Table 19 NI Layer Sector Gross Margin 50
Table 20 Impact of P Balance Limits on NI Layer Sector 50
Table 21 Breakdown of distribution of beef and sheep farms surveyed 51
Table 22 Gross Margin as a Percentage of Output for Lowland NI Beef Enterprises 51
Table 23 Northern Ireland Beef output (kg Cold weight) (July 2024 - June 2025)..... 52
Table 24 Average price of Northern Ireland Beef (p/kg) (July 2024 - June 2025) 52
Table 25 NI Primestock Beef Gross Margin 53
Table 26 Impact of P Balance Limits on NI Primestock Beef 53

Table 27 NI Suckler Cows Gross Margin 53
Table 28 Impact of P Balance Limits on NI Suckler Cows 53
Table 29 Gross Margin as a Percentage of Output for Lowland NI Sheep Enterprises ... 54
Table 30 Kilograms of hoggets / lambs sheepmeat and numbers of ewes and rams slaughtered in Northern Ireland (July 2024 - June 2025) 54
Table 31 Average price of hoggets and lambs slaughtered in Northern Ireland (July 2024 June 2025) 55
Table 32 NI Hoggets / Lambs Gross Margin 55
Table 33 Impact of P Balance Limits on NI Hoggets / Lambs 55
Table 34 NI Ewes & Rams Gross Margin 56
Table 35 Impact of P Balance Limits on NI Ewes & Rams 56
Table 36 Breakdown of distribution of mixed farms surveyed 57
Table 37 Breakdown of distribution of dairy farms surveyed 58
Table 38 Average Milk Yield (l/cow) x farm business size of Northern Ireland Dairy Farms 58
Table 39 Total litres of milk produced and decrease in production at proposed new P levels on surveyed farms (weighted by farm size) 59
Table 40 Northern Ireland Dairy Sector Gross Margin 59
Table 41 Impact of P Balance Limits on NI Dairy Sector 60
Table 42 Impact of 3m Buffer Strips on NI Arable, Potato and Vegetable Sectors 61
Table 43 Breakdown of Northern Ireland farm size by sector 66
Table 44 Northern Ireland Farm Business Survey Gross Margins adjusted by changes in agricultural income 67
Table 45 Standard outputs coefficients 69
Table 46 Standard labour requirements coefficients mapped to DAERA coefficients ... 70
Table 47 Comparison of consultation P balance requirements and draft regulations ... 81

List of Figures

Figure 1 Phosphorus Balance V Soluble Reactive Phosphorus in Rivers 16
Figure 2 Mean total annual DM yield 2022 - 2024 8 experimental sites across Northern Ireland (4320 samples) (AFBI unpublished research (Project 8)) 36
Figure 3 Phosphorus Balance V Soluble Reactive Phosphorus in Rivers 42
Figure 5 Phosphorus Balance v soluble reactive Phosphorus in Rivers 90
Figure 6 Results of Interreg funded CatchmentCare research at AFBI Hillsborough comparing grass only and grass and willow plots 109
Figure 7 Aerial Photograph of the CENIT site at AFBI Hillsborough 110

EXECUTIVE SUMMARY

AgriSearch (The Northern Ireland Agricultural Research and Development Council) welcomes the opportunity to respond to the DAERA consultation on the Nutrients Action Programme (NAP) 2026–2029 but expresses significant reservations regarding the consultation process, the scientific basis of the proposals, and the potential economic and practical impacts on Northern Ireland's agricultural sector.

Key concerns include:

- **Lack of Stakeholder Engagement**: Unlike previous NAP consultations, there was minimal pre-consultation dialogue with industry stakeholders. This has led to confusion, inconsistencies, and a lack of clarity in the proposals.
- **Insufficient Economic Impact Assessment**: The consultation lacks a comprehensive economic analysis of the proposed changes. Any plan must be sustainable, recognising not only the social and environmental aspects but also the economic needs. AgriSearch and partners have conducted preliminary assessments indicating significant financial implications for farmers, particularly in relation to phosphorus (P) balance limits.
- **Scientific Validity of Proposals**: Many proposed measures lack robust scientific evidence. AgriSearch has issues with DAERA's water quality data interpretations and calls for an independent review. The link between agricultural P surplus and river P levels is not clearly established.
- **Unworkable Phosphorus Balance Limits**: The proposed farm-level P balance limits (10 kg/ha by 2027, reducing to 8 kg/ha by 2029) are deemed unachievable for most farms, especially in the pig, poultry, and dairy sectors. These measures risk reductions in livestock numbers or land acquisition, threatening the viability of key agri-food industries.
- **Nitrogen Fertiliser Restrictions**: Proposed reductions in chemical N fertiliser limits are not supported by credible data and could reduce grass yields, increase reliance on imported feed, and paradoxically worsen P surpluses.
- **Additional Bureaucratic Burdens**: Proposals such as real-time slurry movement reporting, mandatory liming, and fertiliser databases introduce significant administrative complexity without clear environmental benefits.
- **Contradictions and Inconsistencies**: Numerous discrepancies exist between the consultation paper and draft regulations, rendering it difficult to response adequately in the consultation process.

AgriSearch urges DAERA to reconsider the scale and pace of proposed changes, engage meaningfully with stakeholders, and adopt a collaborative, evidence-based approach to

improving water quality. The organisation supports targeted, voluntary measures and continued investment in research, innovation, and advisory services to promote sustainable nutrient management.

AgriSearch is committed to working in a positive and proactive manner with all partners across industry, academia and government to help improve the environmental footprint of Northern Ireland's ruminant livestock sector. We very much hope that DAERA will reengage with AgriSearch and other stakeholders to help formulate solutions which deliver for food security, our rural economy and for the environment.

INTRODUCTION

AgriSearch (The Northern Ireland Agricultural Research and Development Council) welcomes the opportunity to respond to the Consultation on the Nutrients Action Programme 2026-2029

AgriSearch was formed in 1997 to provide a mechanism through which beef, dairy and sheep farmers could have direct involvement in agricultural focused research. Funds contributed to AgriSearch are used to commission research into the improvement and development of beef, dairy and sheep farming. Our vision is to drive excellence and innovation within the Northern Ireland ruminant livestock sector and our mission is to drive a sustainable food system that embraces all dimensions of sustainability (people, planet and profit), by acting as a trusted, valued conduit of knowledge that is based on sound science and widely applied research.

AgriSearch will be limiting its response to areas related to its charitable objectives.

AgriSearch recognises the need for continual improvement in water quality from all sectors of society and industry including agriculture. AgriSearch has placed considerable resources into a number of initiatives designed to help improve water quality and nutrient management on farms. AgriSearch remains committed to working in a positive and proactive manner with all partners across industry, academia and government to help improve the environmental footprint of Northern Ireland's ruminant livestock sector.

AgriSearch wishes to respectfully raise concerns regarding the development process of the current Nutrients Action Programme (NAP) proposals. In contrast to previous iterations of the Nitrates Action Programme (2007, 2010, 2014, and 2019), the current proposals appear to have been formulated with limited engagement from key stakeholders within the agricultural sector. AgriSearch believes that inclusive and transparent consultation is essential to ensure that policy measures are both practical and evidence based.

It is also important to recognise the substantial progress made by the farming community since 2007 in improving nutrient management and environmental outcomes. Farmers have invested significantly in enhanced slurry storage capacity through the Farm Nutrient Management Scheme, adopted Low Emission Slurry Spreading Equipment, complied with non-spreading periods, and implemented changes in animal feeding practices, including the use of lower protein and phosphorus diets.

These actions reflect a sustained commitment by the sector to environmental stewardship and continuous improvement. AgriSearch encourages policymakers to

take these achievements into account and to work collaboratively with stakeholders to develop a Nutrients Action Programme that builds on existing progress while supporting practical and sustainable solutions for the future.

CONSULTATION PROCESS

While we welcome the opportunity to respond to this consultation, we have significant reservations over the process leading up to and the consultation process itself.

AgriSearch accepts that the Nutrients Action Programme Regulations (Northern Ireland) 2019 requires DAERA to review and, where necessary revise the action programmes, at least every four years. It should also be noted that this is not a review but a major overhaul of the NAP which the AgriSearch believe to be cross-cutting and significant.

Lack of Stakeholder Engagement

AgriSearch wishes to express its concern regarding the level of stakeholder engagement in the lead-up to the current consultation process. Given the scale and significance of the proposed changes compared to previous Nutrients Action Programmes (NAPs), we had anticipated a more extensive programme of pre-consultation engagement with industry representatives.

While a small number of pre-consultation events were held, these did not provide sufficient insight into the scope or nature of the changes under consideration. In contrast, previous NAP reviews were characterised by more robust and inclusive roundtable discussions with a broad range of stakeholders prior to the publication of consultation documents. Unfortunately, this approach was not replicated in the current process, which has contributed to a sense of frustration and concern within the agri-food sector.

The Environmental Improvement Plan (EIP) rightly acknowledges that existing environmental challenges “can only be addressed if agriculture and farmers are part of the solution.” Similarly, the Programme for Government recognises the vital role the sector plays in meeting climate change obligations and restoring the natural environment. It further commits to supporting the sector through the Sustainable Agriculture Programme by “working with stakeholders to develop coherent policies and design schemes.”

AgriSearch fully supports this collaborative approach and believes it is essential for the successful implementation of any future Nutrients Action Programme. However, we are concerned that the current proposals for the 2026–2029 period do not reflect this commitment in practice. These proposals will have far-reaching implications for the agricultural sector and the wider Northern Ireland economy. Their effectiveness will ultimately depend on the engagement and cooperation of farmers.

In this context, a more inclusive and transparent policy development process is not only desirable but necessary. We respectfully suggest that future consultations be underpinned by more meaningful stakeholder involvement to ensure that policies are both practical and widely supported.

Consultation Documentation

Our ability to give proper consideration to the proposals and to respond to this consultation has been prejudiced by the limited time available to read, consider and understand the voluminous documentation spread over many documents.

There are around 40 changes proposed for NAP 2026-2029 some of which will have serious and negative consequences for farmers and the wider agri-food sector. The ability of farmers and other key agri-food stakeholders to process the vast amounts of information provided in this consultation through the various additional assessment reports, presentations and impact assessments has been very challenging within the initial 8 weeks plus 4-week extension provided particularly over Balmoral Show week, silage season and then a holiday period

AgriSearch are concerned that there are a considerable number of inconsistencies between what is outlined in Chapter 3 of the consultation and that in the draft regulations outlined in Annex 3 of the main consultation document. There are various discrepancies, incorrect figures and missing updates. This makes the consultation difficult to respond to and therefore AgriSearch are responding to a flawed consultation and giving our views based on what we are assuming the consultation paper is proposing.

Our ability to respond to this consultation has been prejudiced by the aforementioned inconsistencies and conflicting information across the documents provided in the consultation website. Presentations provided by DAERA also provided information that appears to contradict what is contained within the consultation documents.

Clarity of Proposals and Assumptions Made

AgriSearch has found it challenging to fully interpret the scope and timing of the proposals set out in the consultation documents. Due to a lack of clarity in certain areas, we have had to make a number of assumptions in formulating our response. We trust that, should any of these assumptions prove to be inaccurate, the Department will

engage with us directly to provide clarification and offer an opportunity to submit further input.

We respectfully note that it is the responsibility of the consultation documents to clearly communicate what is being proposed and what has been assessed. Clear, accessible information is essential to enable stakeholders to provide informed and constructive feedback.

The time available to respond to the consultation has been extremely limited. This is significant given the very serious consequences for our farmer levy payers should these proposals be enacted.

We note that since the date on which we prepared this response that additional documentation has been added to the consultation website. We have not had the opportunity to review these additional documents in the time available. We reserve the right to make further submissions in due course in respect of these documents. We expect that our further representations will be taken into account in due course.

Consultation Events

DAERA hosted four wider 'information events' on the NAP consultation. Two of these events were in person at Loughry and Greenmount and two online. The presentations at these events did not go through the full extent of the NAP proposals and many of the changes would not have been covered despite the potential for impact this will have skewed the understanding of the consultation for those attending.

AgriSearch notes with concern the challenges encountered during the online engagement events associated with this consultation. A number of stakeholders who registered for the first webinar reported not receiving access links, which prevented their participation. Additionally, during both online sessions, the Q&A function was not operational, and attendees were instead directed to submit questions via email to a DAERA address.

We understand that a similar approach was taken during the in-person public information events, where consultees were also invited to submit questions by email. However, to date, DAERA has not published a consolidated list of these questions and the corresponding responses. We believe that making this information publicly available would enhance transparency and support more informed responses from stakeholders. Accordingly, we reserve the right to make further submissions once this information is released.

While we appreciate the effort to provide engagement opportunities, we believe the execution of these events fell short of what is required to effectively inform and support consultees—particularly farmers and other key stakeholders—through the consultation process.

Lack of a Full Economic Impact Assessment

AgriSearch is concerned that a full economic impact assessment was not carried out as part of the consultation process. While a Regulatory Impact Assessment has been produced this appears to be totally inadequate given the scale of the change proposed in the NAP consultation. It only covers the cost of LESSE equipment which is very small part of the very considerable economic impact that would be caused by the full implementation of these proposals.

AgriSearch in partnership with other key agri-food sector stakeholders have commissioned some basic economic analysis work on this which is provided later in this document. This is only an overview and it is clear that a much more significant report is required to fully understand the economic impact of the proposals. However, given the number of proposed changes, the significant impact that they could have and the complexity of the issue it was not feasible to prepare a full assessment within the consultation timescales.

AgriSearch believes that it should be a necessary requirement of all major consultations that a full economic impact assessment is carried out in the same way as Strategic Environmental Assessments are required. This would allow a more balanced consideration of the proposals.

DAERA must provide a full economic impact assessment on the NAP 2026-2029 for consideration which also includes the impact on the agri-food sector supply chain and rural communities.

SCIENTIFIC EVALUATION

Introduction

AgriSearch notes with concern the assertion that the additional measures proposed in the draft Nutrients Action Programme are "based on scientific evidence." In our assessment, several of the proposals appear to lack a clearly articulated or robust scientific evidence base. In some instances, the evidence cited appears to be limited or potentially flawed, raising questions about the validity of the conclusions drawn.

We are also concerned that certain proposals suggest a limited understanding of current agricultural practices and the operational realities faced by farmers. Some measures, as currently framed, may prove unworkable in practice, while others could inadvertently contribute to an increase in phosphorus surplus across Northern Ireland—contrary to the programme's stated objectives.

AgriSearch strongly supports evidence-based policymaking and would welcome the opportunity to engage further with DAERA to ensure that all proposed measures are underpinned by sound science and practical feasibility.

Finally, we have major concerns regarding the scientific robustness of the statistical analyses of water quality data used to justify the new proposals and call for an independent review of the water quality data presented by DAERA

Water Quality Data

Long term trend analysis

In the DAERA document which supports the consultation, 'Review of the 2019 NAP Regulations' page 129, DAERA state that *'Long-term trend analysis for Northern Ireland shows a significant decreasing slope across all years for the mean monthly nitrate and phosphorus concentrations of the river sites (31-year dataset and 25-year dataset respectively)*. However, more recent data (from 2016 onwards) does not follow this trend.' A similar comment is made on Page 8 of the consultation document. DAERA have not presented any statistical analysis to support this conclusion, and consequently there is no evidence to suggest that the slopes of the trend lines are different. It is also concerning that DAERA have chosen 2016 as the base year in their recent nitrate analysis, as this was a particularly low year for nitrate levels across the monitoring network, and out of line with both 2015 and 2017 data.

The evidence presented clearly shows a significant decrease in mean monthly nitrate and phosphorus concentrations across all river sites over a 31-year period (nitrate) and 25-year period (phosphorus).

In the presentation at the Greenmount Information event on 29 May, 2025, uploaded to the DAERA website on 27 June, 2025, Slide 17 of the presentation 'Proposed Nutrients Action Programme 2026-2029' states that there has been a '38% increase in phosphorus in NI rivers since 2012' and that 'the agricultural phosphorus surplus needs to be reduced significantly to improve water quality.' However, DAERA'S own data, presented in Slide 15 of the same presentation, demonstrate that over the 5-year period 2018 to 2023, the overall agricultural P surplus declined by 29.3% from 11.6 to 8.2 kg/ha, yet SRP levels in rivers increased from 0.063 mg/l in 2018 to 0.073 mg/l in 2021, before decreasing to 0.065 mg/l in 2023.

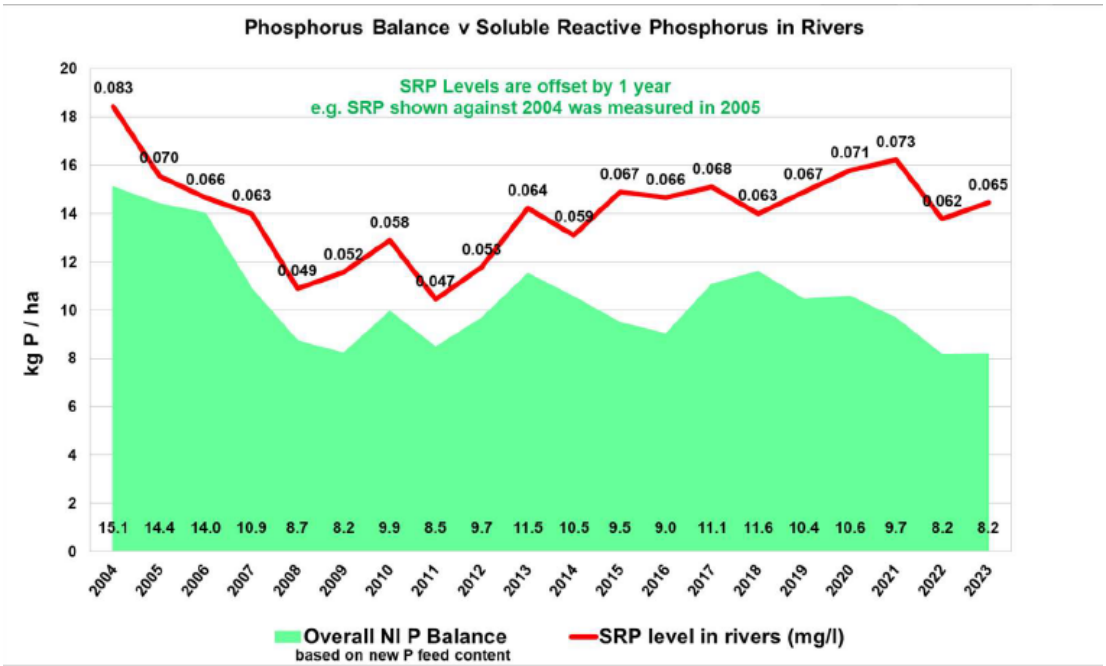

Figure 1 Phosphorus Balance V Soluble Reactive Phosphorus in Rivers

The evidence presented above demonstrates that, from 2014 onwards, there is no clear link between the agricultural P surplus and the soluble reactive phosphorus content of rivers in Northern Ireland. The fact that the agricultural P surplus has declined by 29.3% in the most recent five-year period (2018 – 2023) with no effect on P content of rivers, suggests that non-agricultural P sources are increasing and offsetting the progress made by the agricultural sector.

Furthermore, in the DAERA document 'Review of the 2019 NAP Regulations' page 129, DAERA *state 'Nitrate levels in surface freshwaters are showing signs of increasing concentrations when compared between the reporting periods (2016-2019 and 2020-2023)'*. DAERA have presented no statistical analysis to support this conclusion. It is also important to note that in the Northern Ireland Environmental Statistics Report 2025, 90.6% of rivers had a nitrate concentration less than 10 mg/l, with 93.8% of groundwaters with a nitrate concentration of less than 25 mg/l**.** This clearly demonstrates the very high quality of ground water and rivers in Northern Ireland with respect to nitrate levels.

AgriSearch request that an independent review is undertaken of DAERA/NIEA water quality data on an NI wide basis to verify the statistical procedures used and to provide clarification on whether statements made by DAERA re recent trends in P and N levels in water are statistically valid. Implementation of the proposals should await the publication of this review.

New Proposed Measures

AgriSearch are of the view that the majority of DAERA proposals to amend the current NAP lack an appropriate scientific evidential base.

Several of the proposals present 'unpublished research' as justification, and this is not acceptable as a basis for proposing industry changes which will incur significant increases in cost, reductions in production and significant downsizing of the agri-food sector in Northern Ireland.

Furthermore, it is our view that the current issues around water quality can only be addressed by an overall Northern Ireland strategy, including the issue of wastewater management.

Water Protection: intercepting/breaking nutrient pathways

Uncultivated buffer strips in arable fields

WP1 – DAERA proposes the requirement for a 3-metre uncultivated buffer alongside a waterway in arable fields, from 1 January 2026

The science supporting this measure needs further investigation. The Strategic Environmental Assessment (SEA) notes in relation to buffers that the 'efficacy is uncertain'. Given the questions around the potential for buffers to remove sediment and the ranges outlined in the SEA, more work needs to be done in this area before any proposals are adopted into legislation. Questions also need to be asked around whether riparian buffer strips are the most effective mechanism and whether more adaptable buffers using the LiDAR risk maps supported through an agri-environment scheme are a more appropriate and efficient method of tackling run off and sediment loss from fields.

Stacking of Silage Bales

WP2 - From 1 January 2026, DAERA proposes to revise the requirements for the storage of silage bales in fields, by increasing the distance from a waterway to 20 m and if stacked, not more than two bales high.

AgriSearch oppose this proposal on the basis that DAERA have presented no evidence that the stacking of silage bales causes an adverse environmental impact. The consultation document outlines that '*stacking of silage bales greater than two bales high increases the risk of effluent'* yet they have provided no scientific evidence to support this. Published research (Durr et al, 2004 Grassland Science in Europe 9: 894-896) indicates that 'no leaking effluent was observed for round bale silage with a DM content of more than 250 g/kg.'

There is no scientific justification to limit the stacking of big bale silage, if DM content is greater than 250 g/kg, as there is no risk of effluent pollution.

Additional Phosphorus Controls

Further restrictions on the use of chemical fertiliser containing P

APC 1. DAERA proposes to introduce further restrictions on the use of chemical fertiliser containing phosphorus on grassland. Use will be restricted to the following criteria: grass reseeding, establishment of clover, where a farm has deficit of phosphorus that cannot be met by the importation of organic manures/fertilisers or chemical phosphorus is needed for animal health reasons, soil analysis and a nutrient management plan demonstrating a crop requirement is also required.

AgriSearch recognises the potential of organic manures to meet the majority of phosphorus requirements of grassland and arable crops in Northern Ireland. However, the redistribution of organic manures is a major challenge which DAERA does not appear to recognise. For example, on some farms it is impractical to import slurry or other organic manures onto areas of the farm to satisfy P demand due to steep slopes or accessibility issues. AgriSearch are also concerned that this proposal does not take account of farm biosecurity issues. For example, there is considerable concern regarding the potential for disease transfer between farms linked to movement of organic manures – with concerns re bovine tuberculosis, Johnes Disease, salmonella and botulism.

AgriSearch are also concerned regarding the potential for P deficiency in livestock on some farms, particularly those who have adopted zero P fertiliser application and reduced P levels in animal feed. For example, Ferris *et al* (2010) (Animal 4; 560 – 571) in a survey of 36 farm silages across Northern Ireland observed P concentrations ranging

from 1.4 to 3.9 g/kg DM – this contrasts with the author's (Ferris *et al*) recommendation of P levels in the overall diet of dairy cows of 3.5 – 3.9 g/kg DM. On farms feeding low levels of concentrates, there is potential for P deficiency to occur. Whilst DAERA have proposed that chemical P fertiliser can be used for animal health reasons, no guidance is provided on how this will be determined or administered. AgriSearch recommends that the proposal on use of chemical P should be based on forage P analysis, with provision for its use when forage P deficiency has been identified.

Farm phosphorus balance limits for "intensively stocked" farms

APC 2. DAERA are proposing to introduce a Farm Phosphorus Balance limit for more intensively stocked farms, defined as those with annual livestock manure nitrogen production at and above 150kg N/ha per year. The limit would be phased in as follows:

i. 2027 – limit of 10 kg/P/ha/year
ii. 2029 – limit of 8 kg/P/ha/year.

These limits will also apply to any farms that are producing less than 150 kg/N/yr but subsequently import manure leading to a total N loading (N produced plus N imported) of 150 kg/N/yr and above. The limit of 10 kg/P/ha/year which already applies on derogated farms will reduce to 8 kg/P/ha/year in 2029 in line with ii. above. Farms will be required to submit annual records to NIEA to demonstrate compliance with the P Balance limit.

DAERA indicate on Page 16 of the consultation document that the rationale for introducing this measure is to reduce P losses from agriculture and state that *'It is estimated that 62% of the phosphorus inputs to waterways are from Agriculture.'*

AgriSearch consider that the basis for this statement is invalid. The data which are used to support this statement appear to be based on a paper by Rothwell *et al* (2020) (Resources, Conservation and Recycling 163:105065), which uses P data from 2017. This work is now outdated as a) it uses historical animal feed P levels which have now been corrected in the DAERA database (P balance of 13.1 kg/ha used in the Rothwell paper versus the updated value of 11.1 for 2017) and b) the latest P balance data from DAERA indicate that the P balance for NI agriculture in 2023 was 8.2 kg/ha. The net effect of these two factors is that the P surplus from NI agriculture in the paper by Rothwell et al (2020) has been overestimated by approximately 4.9 kg/ha or 4170 t P/year. Using the current P surplus from NI agriculture of 7100 t P and assuming P losses from non-agriculture sources remain unchanged (in reality they have increased due to additional housing and industrial activity etc), then NI agriculture currently accounts for 50.9 % of P inputs to waterways, not the 62% stated by DAERA. (Full details of calculations presented in Appendix 1.)

On the basis that the original paper by Rothwell et al (2020) is now outdated, AgriSearch request that a new analysis should be undertaken to determine the true contribution of NI agriculture to P inputs to Northern Ireland waterways.

DAERA state on page 17 that 'The water quality improvements achieved from introduction of the Nitrates Action Programme in 2007 up to 2012 have in general been offset by intensification of the agricultural sector over the last 10 years. The increased imports of concentrate feedstuff and consequent rise in the Northern Ireland agricultural phosphorus surplus have resulted in higher losses of phosphorus to waterways.'

AgriSearch consider that the data provided by DAERA does not support this conclusion. P balance data presented during the consultation briefings indicate that the NI agricultural P balance declined by 28.6% from 11.5 kg/ha in 2013 to 8.2 kg/ha in 2023 – a decline of 3.3 kg/ha, which equates to approximately 2845 t less phosphorus per year from agricultural sources. This reflects a decline in overall P balance from 2013 (11.5 kg/ha) to 2016 (9.0 kg/ha), an increase to 2018 (11.6 kg/ha) and a further decrease to 2023 (8.2kg/ha).

Similarly, data from DAERA on nitrogen levels (NAP Implementation Report for 2020-2023) indicates that the overall N balance of NI agriculture has remained relatively stable (115,239 t in 2004-2007 vs 117,059 t in 2020-2022), whilst overall N efficiency has improved from 20.7% in 2004-2007 to 24.7% in 2020-2022. Furthermore, DAERA data on total manure N production from all livestock in Northern Ireland demonstrate that total manure N output was similar in the period 2020/23 at 114.3 kg N/ha/year to that produced over the period 2008/11 at 114.2 kg N/ha/year,

AgriSearch consider that the statement *'intensification of the agricultural sector over the last 10 years'* is factually inaccurate and fails to acknowledge the considerable efforts by industry to improve the overall efficiency of N and P use in livestock diets. AgriSearch are concerned with the implication that agriculture is the sole source of P surplus in NI waterways.

DAERA also state on Page 17 of the Consultation document that '*From 2012 to 2022 average Soluble Reactive Phosphorus (SRP) levels in our rivers increased by 55%.*' This result occurs because of the choice of the base year. For example, the data presented by DAERA demonstrate that over the most recent ten-year time period, 2014 to 2024, SRP levels in rivers stabilised (0.064 in 2014 to 0.065 mg/l in 2024) and decreased over the last 3 years from 0.073 in 2022 to 0.065 in 2024.

Of greater concern is the fact that the overall NI Agriculture P balance declined from 11.5 kg/ha in 2013 to 8.2 kg/ha in 2023 (based on revised P feed content), equivalent to approximately 2845 t less phosphorus per year from agriculture, but this is not reflected in a reduction in river SRP concentrations (0.064 mg/l in 2013 to 0.065 mg/l in 2023, this

suggests that non-agricultural sources of P have increased over this period, thereby negating the reduction in P from NI agriculture.

The evidence available does not demonstrate a clear correlation between the overall NI agriculture P balance and SRP levels in rivers over the last ten years (2013 – 2023). As a consequence, there is no evidence that the proposed reduction in individual farm phosphorus limits will have any impact on future river SRP levels in the absence of an overall Northern Ireland phosphorus strategy. It is particularly concerning that the agricultural P surplus has decreased by 29.3% in the most recent five-year period (2018 – 2023) with no effect on the P content of rivers. This makes it very difficult to understand DAERA's proposal to impose P balance restrictions on farms across Northern Ireland.

AgriSearch also note that the research report used by DAERA on Page 18 of the consultation to suggest a link between farm phosphorus balance and soluble reactive P levels in rivers and lakes (Jordan *et al*, 2024 – Journal of Environmental Management 372:12347) used outdated historical NI farm P balance data which do not reflect the latest DAERA estimates of P balance over the period 2009 to 2023, which take account of reduced P levels in animal feedstuffs. This research needs to be updated to take account of the latest P balance data.

Nitrogen Fertiliser

Prohibition of the use of granular urea fertilisers that do not contain a urease inhibitor

AgriSearch note DAERA proposals for N fertilisers which include: prohibiting the use of granular urea fertilisers unless they contain urease inhibitors; review of the current chemical nitrogen fertiliser limits for grassland; introduction of an allowance/limit for fertilisers derived from processed livestock manures; and a proposal to introduce mandatory liming programmes for grassland farms with manure nitrogen production of 150 kg N per hectare per year or more.

NF 1 AgriSearch note the DAERA proposal to restrict the use of granular urea fertilisers unless they contain urease inhibitors. The requirement to incorporate an inhibitor with urea will restrict competition in the marketplace, as not all fertiliser suppliers can access inhibitor-treated product, and this has the potential to further increase prices. Fertiliser is a significant cost on farms, and any increases will increase production costs, reduce competitiveness and place NI farmers at a disadvantage relative to farmers in the rest of the UK, where similar rules do not apply. In other jurisdictions the requirement to use protected urea only applies in the summer months as ammonia loss

due to volatilisation is very unlikely in our cool damp springs. DAERA should consider adopting a similar approach.

To date, very limited research has been undertaken on the impact of treated urea on soil health and quality. The accompanying Strategic Environment Assessment (Page 184), provided by DAERA, notes that there is '*some uncertainty regarding the potential long-term effects of this measure on population and human health and geology, soils and land use, depending on the inhibitor used. Further research is required to understand the long-term effects on biodiversity, flora and fauna, geology, soils and land use and water with regards to contamination and bioaccumulation, which also remain uncertain.*'

Given the comments above AgriSearch would call for more research on the long-term effect of the use of protected urea to be conducted within Northern Ireland.

Chemical N fertiliser limits (NF2)

DAERA are proposing to reduce the maximum limits for chemical N fertiliser (Page 30), but no scientific data were presented in the original consultation documents to justify this proposal. Following criticism from industry, DAERA eventually published a document entitled 'AFBI Scientific Evidence Contributing to N Fertiliser Limits NAP 2026-2029' on 20 June 2025.

AgriSearch consider that this proposal if implemented will undermine one of the key competitive advantages of ruminant livestock production in Northern Ireland – the ability to produce high yields of quality grass. In any case, we consider that the scientific justification that is provided is flawed.

Data presented by DAERA in the consultation document highlights that animal feed P is the main source of surplus P in Northern Ireland. It therefore seems perverse that DAERA propose to restrict grass growth, by restricting chemical N fertiliser application, thereby increasing the requirement for imported animal feed, further increasing the P surplus for NI.

Data from the NI Environmental Statistics Report (2025) indicate the very low levels of nitrate in rivers and groundwater in Northern Ireland based on sample sites in 2024, with 90.6% of rivers with nitrate levels below 10 mg/l and 94% groundwater sites with nitrate levels below 25 mg/l. In addition, the Sustainable Agricultural Land Management Strategy[1] recommended increasing silage yields and silage quality as a method for 'mining' P from soils and displacing P from concentrate feeds. Increasing the yield of grass grown removes more phosphorus from the soil (Khomenko et al 2023 Soil Science

[1] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/16.17.079%20Sustainable%20Land%20Management%20Strategy%20final%20amended.PDF

13:100110) thereby reducing potential for P loss to waterways. Increasing silage yields and quality was also shown to lower P balances on farms. However, to achieve these higher silage yields, appropriate levels of chemical N are needed which is contrary to what is being proposed in the NAP 2026-2029 consultation.

AgriSearch considers that the evidence supporting DAERA's proposal to reduce chemical fertiliser N limits, in the paper presented by DAERA on the NAP Consultation website on 20 June 2025 entitled 'AFBI Scientific Evidence Contributing to N Fertiliser Limits.'[2] Is seriously flawed

A full appraisal of the paper is presented in Appendix 2. In brief the appraisal notes that none of the trials referred to in the AFBI paper were designed to investigate grass yield responses to chemical N fertiliser under non limiting conditions. Several of the studies are confounded by constraints on herbage production, including low pH soils, incomplete assessment of growth over the full growing season, delayed application of fertiliser in spring and early cessation of fertiliser application in mid-summer. Of particular concern is the reliance on several unpublished studies, including a recent trial, which appears to be the main basis for the proposed reduction in chemical N levels. The inflated year one results for the zero N treatment is also a major deficiency. The suggestion that maximum grass DM yield is obtained at 250 kg N, based on results of an unpublished study, goes against all previously published data, including the recommendations for average, good, and very good grass growing conditions in RB 209 recommendations.

Furthermore, the AFBI paper omits to include the seminal papers on grassland response to N (the Grassland Manure or GM studies) published in the early 1980's which provide a robust scientific evidence base for current chemical N fertiliser recommendations. AFBI have also chosen not to include data from a more recent published study undertaken at Hillsborough (Forrestal et al, 2017), which demonstrates a much higher response to N fertiliser than the unpublished studies included in the report.

In their calculations of the fertiliser limits for slurry AFBI have assumed that 40% of N in slurry is always available to the plant whereas in reality this level of N availability is usually only seen during spring applications and would generally not be applicable from second cut onwards.

The reductions proposed in chemical N fertiliser will significantly reduce herbage production for silage on ruminant livestock farms in Northern Ireland. For example, currently 'other livestock' farms can apply up to 222 kg chemical N/ha under the 2019

[22] https://www.daera-ni.gov.uk/sites/default/files/2025-06/AFBI%20Scientific%20Evidence%20Contributing%20to%20N%20Fertiliser%20Limits%20NAP%202026-2029%20Final%20June%2025.PDF

NAP, with dairy farms applying up to 272 kg N/ha. Under the new proposals the maximum chemical N fertiliser limits for dairy and intensive beef farms is 150 kg N/ha for derogated farms and 182 kg N/ha for non-derogated farms, with limits of 210 and 242 kg N/ha for derogated and non-derogated 'intensive high yielding' farms respectively.

The potential implications of the proposed reductions in chemical N fertiliser are presented in Appendix 3. In summary, the proposed lower limits could result in a reduction in silage production of 83,700 t DM, and assuming that half of those affected decide to feed more concentrates to replace this, will require 47,550 t additional concentrate (as fed basis). Based on an average P content of 4.7 g/kg fresh weight, this will increase the overall NI agricultural P surplus by 221.6 t

It is interesting to note that the estimated reduction in grass yield calculated above is in line with a DAERA Advisory note issued on the DAERA website on 1 April 2022 entitled 'Fertiliser for first cut silage'[3].

'For example, in a recent scenario generated for a 100 dairy herd plus followers at a stocking rate of 2.0 CE/ ha, it was estimated that reducing applications of CAN by 20 kg N/ ha per cut over a 3 cut silage system, could reduce the amount of fertiliser applied by 7.4 t leading to a saving of around £6,500. However, the reduction in yield may result in a reduction of around 200 t silage (60 t DM) to the resulting fodder stocks on the farm than in previous years. Replacing this with purchased silage at £40/ t could result in a cost of £8,000. Alternatively replacing the deficit with concentrate at £400/ t could cost around £27,000.'

The net impact of this proposal will be either a) a reduction in livestock numbers or b) an increased use of supplementary feeds containing additional P. It also has the potential to further overheat the Northern Ireland conacre market resulting in much higher land rental rates. A further perverse outcome of the new proposals is that derogated farms, operating at significantly higher stocking rates, with an increased grass requirement, will be required to use lower chemical N fertiliser rates than non-derogated farms operating at lower stocking rates.

[3] https://www.daera-ni.gov.uk/news/fertiliser-first-cut-silage

Allowances for processed organic fertilisers

NF 3 AgriSearch notes that DAERA propose to limit the allowance for Processed Organic Fertilisers derived from agricultural sources and that these fertilisers will be classified separately from "livestock manure" and will count towards the limit for "Chemical Fertiliser or organic nitrogen supply other than livestock manure".

In principle, AgriSearch supports the proposal to introduce an allowance for processed livestock manures as this will facilitate processing of manure/slurry in Northern Ireland. However, insufficient detail is provided in the consultation document in terms of the definition of 'processed organic fertilisers' or 'processed livestock manures' or the justification for a proposed limit of 100kgN/ha from processed organic fertilisers.

Mandatory liming

NF 4 DAERA is proposing to introduce mandatory liming as a statutory requirement for all grassland farms within Northern Ireland with manure nitrogen production at or above 150 kg N per hectare per year.

AgriSearch considers that application of lime on a regular basis is good agricultural practice, but there is a lack of detail within the consultation, and no discussion has taken place with stakeholders on the practicalities of introducing such a scheme.

We consider that it would be preferable to have an increased emphasis from DAERA and NIEA on education and promotion of the benefits of liming and an optimum pH status as a key opportunity to increase grassland productivity at low cost.

AgriSearch also wishes to highlight the need for additional research to define optimal soil pH for different sward types, for example perennial ryegrass (prg) swards, prg/white clover swards, red clover swards and mixed species swards.

Appendix 1. Critique of DAERA's estimate of the proportion of P surplus in NI which can be attributed to the agricultural sector.

DAERA state on Page 16 of the Consultation document that the rationale for introducing P balance restrictions in Northern Ireland is to reduce P losses from agriculture and state that *'It is estimated that 62% of the phosphorus inputs to waterways are from Agriculture.'*

The data which appear to be used to support this statement are based on a paper by Rothwell et al (2020) (Resources, Conservation and Recycling 163:105065), which uses P data from 2017. This work is now outdated as a) it uses historical animal feed P levels which have now been corrected in the DAERA database (P balance of 13.1 kg/ha used by Rothwell et al (2020) versus the updated value of 11.1 for 2017) and b) the latest P balance data from DAERA indicate that the P balance for NI agriculture in 2023 was 8.2 kg/ha. The net effect of these two factors is that the P surplus from NI agriculture in the paper by Rothwell et al (2020) has been overestimated by approximately 4.9 kg/ha or 4170 t P/year (based on a farmed area of 851,350ha).

In a presentation to the AERA Committee on 8 May, 2025[4], a DAERA official commented that the current P surplus from NI agriculture (2023) was recorded as 7100 t P – this is significantly less than the values assumed in the paper presented by Rothwell et al (2020). Using DAERA data for the P surplus for NI agriculture (13.1 kg P/ha - original feed P levels), the overall estimated P surplus for NI agriculture at that time is estimated at 11,152 t P (based on farmed area of 851,350ha). If, as stated by DAERA, this represents 62% of P inputs, then total P inputs in 2017 were estimated at 17,987 t P, of which non-agriculture sources amounted to 6835 t P.

Using the current P surplus from NI agriculture of 7100 t P and assuming P losses from non-agriculture sources remain unchanged (in reality they have increased due to additional housing etc), then NI agriculture currently accounts for 50.9% of P inputs to waterways, not the 62% stated by DAERA.

[4] Committee for Agriculture, Environment and Rural Affairs Meeting, Thursday 8 May 2025 - Northern Ireland Assembly TV

Appendix 2. A Scientific Evaluation of the AFBI Paper '*AFBI Scientific Evidence Contributing to N Fertiliser Limit'* posted on the NAP Consultation website on 20 June 2025

Background

Assuming optimal soil pH (6.3 - 6.5) and a balanced supply of other essential nutrients (P, K and S), nitrogen is the single most important nutrient influencing grass growth. The classical grassland manuring experiments (Jackson and Williams (1979) and Morrison et al (1980)) demonstrated that maximum response to N on sown grassland occurs at relatively high levels.

Jackson and Williams (1979)[5] compared the response of perennial ryegrass (cv. S. 23) swards to fertilizer N at input rates of 200, 400 and 600 kg N/ha under cutting-only or grazing-only management systems. The experiment was conducted at six widely separated sites in England and Wales for 4 years. Under both managements the yield response to N varied substantially and was always greater under cutting than grazing and the response was greater in the first than in subsequent years. **Under cutting, significant responses were obtained from 200 to 400 kg N/ha at all sites** and in all years but very few sites responded significantly from 400 to 600 kg N/ha after the first year.

Morrison et al (1980)[6] carried out a very large scale and very well-known multi-site study across England and Wales – the Grassland Manuring 20 Trial, which involved 21 sites over 4 years and **noted that the maximum response to N on sown grassland occurred at 500 – 700 kg N/ha**. They noted a mean response at N300, relative to N0 of 23 kg DM/kg N.

Hopkins et al (1990)[7] examined the response of both permanent and reseeded grassland to fertilizer N at sixteen sites across England and Wales, representing a wide range of grassland environments. Responses were examined at two cutting frequencies to simulate grazing and silage production (4-week and 8-week cutting interval respectively) with N levels of 0, 150, 300, 450 and 900 kg N/ha. N fertilizer was applied as ammonium nitrate in either 6 (4 -week cutting) or 3 (8-week cutting) equal applications and total yield was measured from spring to late October/November.

[5] Jackson MV and Williams TE (1979) Response of grass swards to fertilizer N under cutting or grazing. Journal of Agricultural Science, Cambridge 92: 549 -562

[6] Morrison J, Jackson MV and Sparrow PE (1980) The response of perennial ryegrass to fertilizer nitrogen in relation to climate and soil. Technical Report No 27, Grassland Research Institute, Hurley

[7] Hopkins A, Gilbey J, Dibb C, Bowling P J and Murray P (1990) Response of permanent and reseeded grassland to fertilizer nitrogen. 1 Herbage production and herbage quality. Grass and Forage Science 45: 43-55

Results indicated that average yield of herbage increased up to 450 kg N/ha with both permanent and reseeded swards, under both cutting frequencies as shown in Tables 1 & 2 below.

As expected, the marginal response to additional N declined as level of application increased, but N10 (the economic optimum where 1 additional kg of N fertilizer produced an additional 10 kg of herbage DM) occurred above 350 kg N/ha.

Table 1 Effect of fertiliser N level on herbage production (average of reseeded and permanent swards) Hopkins et al (1980) 4 weekly cutting, average of three years across reseeds and perm pasture

N (kg N/ha)	DM Yield (t DM/ha)	Marginal Response (kg DM/kg additional N)
0	4.40	–
150	7.33	19.5
300	9.70	15.8
450	10.68	6.5
900	10.77	–

Table 2 Effect of fertiliser N level on herbage production (average of reseeded and permanent swards) Hopkins et al (1980) 8 weekly cutting, average of three years across reseed and perm pasture

N (kg N/ha)	DM Yield (t DM/ha)	Marginal Response (kg DM/kg additional N)
0	6.96	–
150	10.51	23.6
300	12.56	13.5
450	13.51	6.3
900	13.14	–

Conclusion: Annual total herbage DM yield from both permanent and reseeded swards increased with successive increments of fertiliser up to 450 kg N/ha, with an economic optimum application above 350 kg N/ha.

A more recent study conducted across Johnstown Castle, Moorepark and Hillsborough examined the effect of fertilizer type on grass growth response (Forrestal et al (2017)[8]). It is important to note that AFBI chose not to include this study in their review.

[8] Forrestal, P. J., Harty, M. A., Carolan, R., Watson, C. J., Lanigan, G. J., Wall, D. P., Hennessy, D. and Richards, K. G. (2017), Can the agronomic performance of urea equal calcium ammonium nitrate across nitrogen rates in temperate grassland? Soil Use Manage, 33: 243–251.

Table 3 Hillsborough Data – Response to chemical N fertiliser level.

Fert N level (kg N/ha)	Herbage Yield Year 1 (t DM/ha)	Herbage Yield Year 2 (t DM/ha)
0	6.10	6.50
100	8.50	9.43
200	10.62	12.23
300	12.12	14.24
400	13.29	14.85
500	13.95	15.47

Source: Forrestal et al (2017)

The study involved a control treatment plus 5 rates of N fertiliser up to 500 kg N/ha, with four cuts per year for Hillsborough in 2013 (HB13) and 5 cuts per year in 2014 (HB14).

Results from Hillsborough can be seen in Table 3 above. Full details of the results across all four sites are presented in Table 4 below.

Table 4 Grass dry matter yield at each site for N rates 0 to 500 kg/ha. N rates were applied in five equal split applications during the grazing season

Site year	Annual N rate (kg N/ha)					
	0	100	200	300	400	500
	Yield (kg DM/ha)					
HB13	6103 BC f	8497 D e	10624 D d	12120 C c	13292 B b	13952 CD a
HB14	6497 AB e	9432 C d	12234 BC c	14245 A b	14850 A a	15467 A a
JC13	5252 C e	7975 E d	9694 E c	10856 D b	11532 C a	11914 E a
JC14	7161 A d	10292 AB c	12783 AB b	14404 A a	14789 A a	15049 AB a
MP13	6596 AB e	9692 BC d	11820 C c	12665 C b	13067 B ab	13378 D a
MP14	6874 AB e	10333 AB d	13224 A c	13588 B bc	14325 A a	14381 BC a
Pooled standard error of the mean = 259.3 kg/ha (371.7 kg/ha for the control group)						

Mean comparison by *F*-protected LSD test ($P \leq 0.05$).
Within columns yields with different upper case letters are significantly different.
Within rows yields with different lower case letters are significantly different.

The authors concluded that all sites responded positively to increasing N rate with significant yield responses up to 500 kg N/ha at Hillsborough in 2013 and up to 400kg N/ha at Hillsborough in 2014.

AFBI REPORT

A series of studies (majority unpublished) are presented by AFBI to justify the proposed lower chemical N fertiliser limits for grassland.

Project 1 A three-year study at Hillsborough designed to examine effects of G lime on soil pH and grass productivity (Higgins et al., 2012 Soil Use and Management 28:62-69[9])

Permanent grassland dominated by meadow grass and perennial ryegrass. **Soil pH was 5.72 at start of study - sub-optimal for maximum grass production.**

Slurry applied in Year 1 – 30 cubic meters per ha after first and second cuts = 60 kg N/ha not accounted for in Year 1 in determining the chemical N response.

Fertiliser applied in 3 applications – no dates or levels given. All N applied as CAN – 0, 75, 150, 225 and 300 kg N/ha. **No split application in spring and first application applied in early April, missing maximum response period.**

Results are presented in Table 5 below**.** Note very different response in Year 1, when plots received an additional 60 Kg manure N/ha. These data should not be included in treatment means due to large slurry effect on the N response relationship. Table 6 presents the yield response data with 2007 data removed.

Table 5 Mean annual (three cuts) total grass dry matter (DM) yield (t/ha) in response to N fertiliser rate, [for] pelletized and ground lime combined. [b]

	Mean annual DM yield (t/ha)		
N rate (kg N/ha/yr)	2007	2008	2009
0	9.01	4.94	4.71
75	10.04	6.87	7.35
150	11.29	8.91	9.91
225	12.09	10.61	11.26
300	11.72	11.15	11.76
LSD	0.62	0.54	0.48

[a]Highly significant ($P < 0.001$). [b]Not significant.

[9] Higgins S, Morrison S and Watson, CJ (2012) Effect of annual applications of pelletized dolomitic lime on soil chemical properties and grass productivity. Soil Use and Management 28: 62-69.

Table 6 Average of 2008 and 2009, when no manure N was applied

kg N/ha	DM yield (t DM/ha)
0	4.82
75	7.11
150	9.41
225	10.93
300	11.45

Increases in yield continued to 300 kg N/ha despite late first application (missed max response period), mixed meadow grass/prg sward, low soil pH and no split application for first cut (RB209 recommendation).

Summary – Trial results invalid as slurry applied to chemical fertilizer N treatments in Year 1 and not accounted for, yields in 2008 and 2009 continued to increase to 300 kg N/ha despite sub-optimal soil pH limiting N response and delayed application of chemical N fertilizer in spring.

Project 2 Cardenas et al 2019 (Science of the Total Environment 661: 696-710[10]). Nitrous oxide emission study across 5 UK sites – one year study 2011. Permanent grassland site

Fertilizer application dates: 21 March, 18 April, 16 May and 14 July. Harvest dates: 10 May, 27 June and 15 August.

Key Issues:

Late spring application, (21 March), no split N in spring, very high application rates mid-season for high N levels (120 and 100 kg N/ha applied on 16 May and 14 July respectively) at time of lowest response. Last chemical N application on 14 July (halfway through the growing season). Last silage cut taken on 15 August, so no measurement of late season response to additional N.

[10] Cardenas, L. M., Bhogal, A., Chadwick, D. R., McGeough, K., Misselbrook, T. H., Rees, R. M., Thorman, R. E., Watson, C. J., Williams, J. R., Smith, K. A. and Calvet, S. 2019. Nitrogen use efficiency and nitrous oxide emissions from five UK fertilised grasslands. Science of the Total Environment. 661: 696-710.

Table 7 Total grass dry matter (DM) yield (t/ha) in response to N fertiliser rate (Cardenas et al 2019)

Total (kg N/ha)	21 March	18 April	16 May	14 July	Hills Yield (t DM/ha)	Response
0					5.46	
80	20	20	20	20	9.65	52.3
160	30	40	50	40	11.78	26.6
240	40	60	80	60	14.81	37.8
320	70	70	100	80	15.11	3.7
400	90	90	120	100	16.97	23.2

Whilst the difference between 320 and 400 kg N/ha was 'not significant' the response was 1.86 t DM/ha for an additional 80 kg N/ha i.e. a response of 23.2 kg grass DM/kg additional N. This compares with a response of 26.6 kg grass DM between 80 and 160 kg N/ha. The reason for the 'non-significant' response is due to the very high error (s.e.d. of 0.68 t DM/ha) which is very high for the Hillsborough site compared to the other sites in the study.

Table 8 Herbage production results: grass yield, N offtake and N content of herbage. Standard errors (s.e.d.) are also provided. (Cardenas et al 2019)

	Increase in AN rates						Change in strategy at 320 kg N ha^{-1} application				
	C	AN80	AN160	AN240	AN320	AN400	AN320_NI	U320	U320_NI	AN320_Sp	s.e.d.
Yield (t DM ha^{-1})											
Crichton	3.85^{a}	8.18^{b}	9.72^{bc}	10.81^{c}	11.03^{c}	11.28^{c}	10.91^{c}	10.74^{c}	10.83^{c}	11.16^{c}	0.50
Drayton	2.78^{a}	4.44^{b}	6.30^{c}	7.82^{d}	9.32^{e}	9.46^{e}	9.28^{e}	8.84^{de}	7.95^{d}	8.90^{de}	0.33
North Wyke	4.22^{a}	6.01^{b}	7.59^{b}	9.21^{c}	10.54^{cd}	10.89^{d}	9.85^{cd}	9.72^{cd}	9.26^{c}	10.29^{cd}	0.45
Hillsborough	5.46^{a}	9.65^{b}	11.78^{bc}	14.81^{def}	15.11^{def}	16.97^{f}	15.34^{def}	13.79^{cd}	14.40^{de}	16.70^{ef}	0.68
Pwllpeiran	4.65^{a}	7.25^{b}	10.22^{c}	11.37^{cd}	12.00^{d}	12.15^{d}	12.38^{d}	11.37^{cd}	10.94^{cd}	12.18^{d}	0.45
N offtake (kg N ha^{-1} y^{-1})											
Crichton	49.7^{a}	112.4^{b}	162.0^{c}	191.5^{cd}	251.7^{f}	286.8^{g}	245.4^{ef}	218.1^{de}	224.1^{ef}	285.3^{g}	10.9
Drayton	54.6^{a}	86.1^{a}	132.6^{b}	174.1^{c}	197.5^{cd}	241.2^{e}	223.3^{de}	205.1^{cde}	173.6^{c}	210.5^{cde}	13.5
North Wyke	89.3^{a}	129.7^{a}	180.2^{b}	247.3^{c}	309.6^{ef}	341.9^{f}	275.3^{cde}	262.0^{cd}	244.1^{c}	292.9^{de}	14.7
Hillsborough	88.1^{a}	158.3^{b}	173.5^{b}	282.5^{c}	300.0^{c}	362.7^{d}	301.2^{c}	256.7^{c}	294.5^{c}	304.8^{cd}	20.2
Pwllpeiran	68.0^{a}	115.4^{b}	171.5^{c}	252.9^{ef}	274.1^{f}	336.9^{g}	269.5^{f}	236.9^{de}	217.4^{d}	268.9^{f}	7.34
N content of herbage (kg N kg^{-1} t DM)											
Crichton	13.1^{a}	13.8^{a}	16.7^{b}	17.7^{bc}	22.8^{de}	25.4^{ef}	22.5^{d}	20.3^{cd}	20.7^{d}	25.6^{f}	0.89
Drayton	19.7^{a}	19.2^{a}	21.0^{ab}	22.2^{abc}	21.1^{abc}	25.5^{d}	24.0^{cd}	23.2^{bcd}	21.9^{abc}	23.6^{bcd}	1.03
North Wyke	21.2^{a}	21.5^{a}	23.7^{b}	26.8^{cd}	29.4^{e}	31.4^{f}	27.9^{de}	27.0^{cd}	26.3^{c}	28.4^{de}	0.56
Hillsborough	16.0^{ab}	16.0^{ab}	14.7^{a}	19.1^{abc}	20.0^{bc}	21.5^{c}	19.7^{bc}	18.6^{abc}	20.5^{bc}	18.3^{abc}	1.59
Pwllpeiran	14.6^{a}	15.9^{ab}	16.8^{b}	22.3^{d}	22.9^{d}	27.8^{e}	21.9^{cd}	20.8^{cd}	19.9^{c}	22.1^{d}	0.74

Values with different letters (a to f) within a row indicate significant differences between treatments ($P < 0.05$).

Results of the study across all sites are presented in Table 8 above. Note the very high yield potential of the NI site at 400 kg N/ha -17 t DM/ha compared to 11.3 t Scotland, 9.5 and 10.9 t England and 12.1 t Wales.

Summary – Despite significant trial limitations, grass yield responses were recorded up to 400 kg N/ha, with no evidence to support a maximum application of 310 kg N/ha.

Project 3 Higgins, S. Watson, C. Laughlin, R. 2013[11]. The potential for urea plus a urease inhibitor to reduce nitrous oxide emissions from grassland compared with CAN, while maintaining sward production. Final E&I Report: Project 11/04/02

Unpublished study – details of study not available.

Project 4 Watson et al. Strategies to reduce emissions from nitrogen fertiliser application. Final E&I Report: Project 13/4/06
Unpublished study – details of study not available.

Krol et al. 2020[12]. Nitrogen fertilisers with urease inhibitors reduce nitrous oxide and ammonia losses, while retaining yield in temperate grassland. Science of the Total Environment 725: 138329 Study reports effects of different N fertiliser type on emissions etc – no N response level data.

Project 5 Unpublished research by AFBI referred to as Higgins et al (2025). This study appears to involve a series of N treatments including digestate, plasma-treated digestate and chemical N fertiliser, but no details of experimental methodology are provided. N fertilizer rates appear to be compounded with application of digestate – response from 68 to 104 kg N/ha was 6.7t DM/ha i.e. a response of 186 kg grass DM/kg fertiliser N!

Project 6 Unpublished research undertaken at 8 farms sites in Co Londonderry and Antrim. No details of methodology provided.

This trial appears to be the main study used to support the DAERA/AFBI proposal to reduce chemical N fertiliser levels in Northern Ireland. Replicated study at eight farm sites across NI: Coleraine, Dark Hedges, Glenwherry, Greenmount, Magherafelt, Toomebridge, Slemish and Ballybogey. All sites were permanent grassland but no details are provided of sward composition or reseeding history.

Key limitations of the study include: Soil pH was below 6 at five of the sites (5.54 – 5.96) and no lime was applied to any site. This is estimated to depress yield response to N by approximately 1.5 – 2.0 t DM/ha.

[11] Higgins S, Morrison S and Watson, CJ (2012) Effect of annual applications of pelletized dolomitic lime on soil chemical properties and grass productivity. Soil Use and Management 28: 62-69
[12] Krol DJ, Forrestal PJ, Wall D, Lanigan GJ, Sanz-Gomez J and Richards KJ (2020) Nitrogen fertilisers with urease inhibitors reduce nitrous oxide and ammonia losses, while retaining yield in temperate grassland. Science of the Total Environment 725:138329

Fertiliser application rates and timing are given in Table 9 below, with fertiliser being applied as CAN (27% N fertiliser).

Table 9 - N Fertiliser application per experimental site and timing of application (AFBI unpublished research (Project 8))

N Rates kg N ha/yr	Application Number		
	1 (Mar/Apr)	2 (May/June)	3 (July)
0	0	0	0
130	80	30	20
250	100	75	75
310	120	100	90

In Year 1, no fertilizer was applied until 8 -14 April, and in Years 2 and 3 the first fertilizer application dates varied from 24 – 31 March (Year 2) and 19 – 23 March (Year 3).

No N fertiliser was applied in early spring in contrast to normal farm practice (N is usually applied as slurry in Feb/March). Spring applications produce the best response in grass growth.

The cutting date for Cut 1 varied from 26 May to 14 June in Year 1, 9 to 16 May in Year 2 and 13 – 17 May in Year 3. The cutting date for Cut 2 varied from 7 July to 2 August (Year 1), 26 – 28 June (Year 2) and 1 – 18 July (Year 3).

The final harvest date varied from 31 August to 8 Sept (Year 1), 14 – 17 August (Year 2) and 14 August to 28 August (Year 3).

It appears that no account is taken of grass growth from late August onwards, as the last harvest date occurred from 14 August to 8 September.

The interval from cutting date to fertilizer application varied from 1- 17 days over the three years of the study. The last fertilizer application was applied on 7 July to 2 August (Year 1), 26 – 28 June (Year 2) and 1- 19 July (Year 3).

No fertilizer was applied to the plots from late June in Year 2 and from mid-July in Year 3, whereas normal farm practice is to continue N application until early September.

The grass yield data presented in Table 10 below are extremely unusual. For example, DM yields of 8.3, 10.8, 11.4, 7.3, 9.0 and 7.7 t DM/ha were recorded for 6 sites in 2022 at zero N fertilizer. The majority of previous published reports for zero N fertilizer indicate DM yields of 4.4 – 7.0 t DM/ha as shown in Table 11 below. Furthermore, the long term AgriSearch GrassCheck project recorded grass DM yields of 5.4 t and 4.5 t DM/ha in

2023 and 2024 respectively, with no yields greater than 6.0 t DM/ha being obtained for zero N fertilizer on Grass Check plots over a 20-year period (2004 to 2024).

Table 10 Mean total annual DM yields (t SM/ha/yr) per N rate, at each experimental site in 2022, 2023 and 2024 (AFBI unpublished research (Project 8))

N Rate kg N/ha/yr	Site								
2022	**Ballybogey**	**Coleraine**	**Dark Hedges**	**Glenwherry**	**Greenmount**	**Toomebridge**	**Slemish**	**Magherafelt**	**Overall Mean***
0	8.30	10.82	11.44	7.29	8.96	7.68	5.30	6.21	8.28 a
130	12.63	15.05	13.65	10.82	11.43	12.16	9.97	13.31	12.38 b
250	14.71	15.68	15.83	12.03	13.64	13.72	12.17	15.39	14.15 c
310	13.92	16.01	14.86	12.33	13.82	14.25	12.26	16.49	14.24 c
2023									
0	6.73	6.65	5.64	6.45	7.36	5.69	5.74	6.55	6.35 a
130	9.96	9.82	9.49	8.49	12.07	12.61	9.39	10.79	10.33 b
250	12.16	11.87	10.82	9.20	14.58	15.28	12.03	14.12	12.51 c
310	12.00	12.29	11.23	9.33	14.59	15.79	12.57	13.92	12.73 c
2024									
0	6.36	7.46	4.63	6.56	8.77	7.40	3.84	5.59	6.31 a
130	11.20	12.05	8.81	9.39	13.07	12.99	8.71	10.81	10.88 b
250	11.95	14.71	10.45	10.17	15.67	14.10	11.28	14.90	12.90 c
310	12.55	15.17	10.98	10.48	14.42	14.21	11.76	14.59	13.04 c

*Fisher's unprotected least significant difference test. Change in letter denotes significant difference between means

Table 11 Published studies – DM yield at zero N fertiliser

Study	**DM yield at zero N (t DM/ha)**
Hopkins et al (2019)	4.4 (4 weekly cutting)
	6.96 (8 weekly cutting)
Higgins et al (2012)	4.94 (2008 – no spring slurry)
	4.71 (2009 – no spring slurry)
Cardenas et al (2019	5.46
Forrestal et al (2017)	6.1 (2013)
	6.5 (2014)
Krol et al (2020)	4.53

The unusually high grass DM yields recorded with the zero fertilizer N treatment in this unpublished study in year 1 suggests that there was an alternative N supply for the sward (possibly slurry or fertilizer application in spring or a high proportion of clover) and therefore invalidate the trial results for 6 of the 8 sites.

The overall response to fertiliser N in this study is illustrated in Figure 2 below and summarized in Table 12 below.

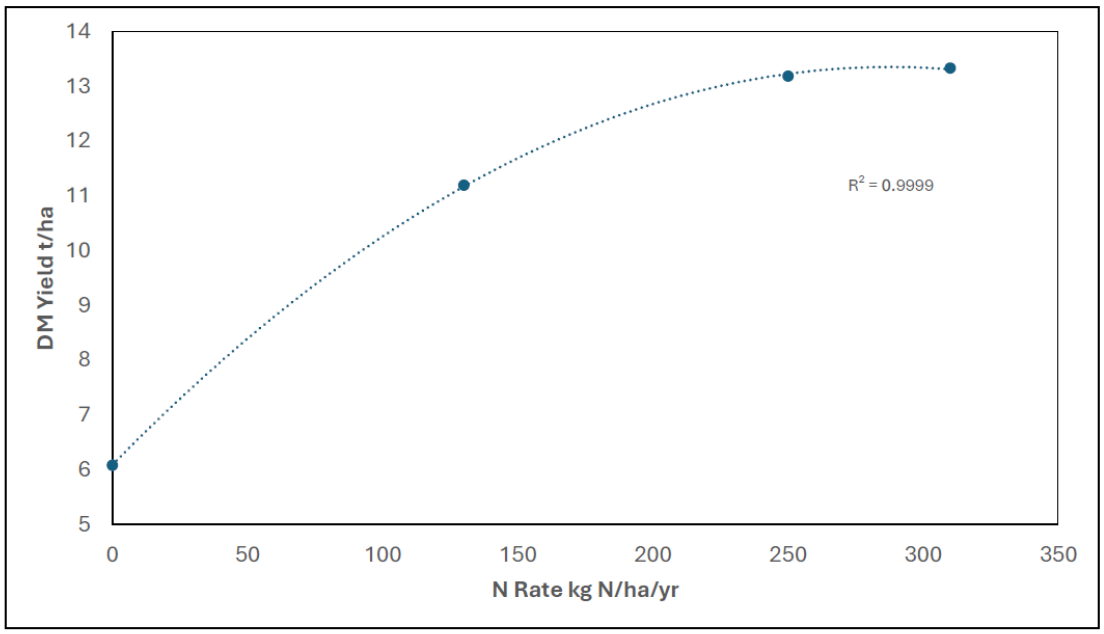

Figure 2 Mean total annual DM yield 2022 - 2024 8 experimental sites across Northern Ireland (4320 samples) (AFBI unpublished research (Project 8))

Table 12 Overall herbage yield response to N fertilizer (2022-2024) across 8 sites (Project 6 Unpublished study)

N Rate kg N/ha/yr	Total DM Yield t/ha/yr
0	6.1
130	11.2
250	13.2
310	13.3

The study concluded that '*No significant yield response was obtained beyond 250 kg N/ha/year.*'

The suggestion that maximum grass DM yield is obtained at 250 kg N goes against all previously published data and recommendations for average, good, very good grass growing conditions, including RB 209 recommendations.

Results of this unpublished research cannot be used as a credible basis to inform N recommendations for grass swards in Northern Ireland, given several major shortcomings of the trial summarized as follows:

i. Soil pH was suboptimal (range 5.54 – 5.96) at five of the eight sites used in this study – this will have reduced the grass yield response to N fertilizer.

ii. There appears to have been an alternative source of nitrogen available to boost grass production in year 1 on 6 of the 8 sites, given the exceptionally high grass DM yields at zero N fertilizer.

iii. The first application of fertiliser N was applied very late in all three years, relative to standard farm practice (Year 1, 8 -14 April, and in Years 2 and 3 first fertilizer application dates varied from 24 – 31 March (Year 2) and 19 – 23 March (Year 3).

Normal farm practice is to apply slurry in February/early March to stimulate early season growth at time of maximum N response.

iv. At the highest N level, the first N application on the high N treatment (310 kg N/ha/year) was applied as a single application of 120 kg N/ha as CAN. RB209 recommends a split fertilizer application for first cut, with an application in late February, followed by a second application in late March.

v. CAN was used as the N fertilizer source in this study. CAN is particularly susceptible to leaching on heavy soils and wet conditions, such as those experienced in 2022, 2023 and 2024.

vi. The final N application in this unpublished study was applied from 7 July to 2 August (Year 1), 26 – 28 June (Year 2) and 1- 19 July (Year 3). Normal farm practice is to apply fertilizer through July and August, with good responses in grass growth being obtained at these times.

vii. The final harvest was taken from 31 August to 8 Sept (Year 1), 14 – 17 August (Year 2) and 14 August to 28 August (Year 3). There appears to have been no assessment of late season growth, which could account for up to 20 % of total sward production.

viii. The yield at the highest level of N fertilizer in this study was 13.3 t DM/ha. This contrasts with previous reported herbage DM yields from published AFBI studies of 15.8 t DM/ha (Huson et al, 2022 Grass and Forage Science 78:547-562) and 17 t DM/ha (Cardenas et al, 2019)

Other studies not referenced in the DAERA/AFBI review:

Grazing recommendations.

The review states that AFBI have not carried out any recent replicated field trials assessing N requirements for grazed fields. Whilst proposing to limit chemical N fertiliser levels on grazing areas to 180 kg N/ha in the original Consultation, DAERA/AFBI have now changed this to a maximum of 270 kg N/ha, which is in line with the current maximum limit of 272 kg chemical N/ha in the 2019 NAP.

It is important to note that this level is well below that recommended from previous research studies. For example, Holmes (1968)[13] demonstrated a linear response in cow grazing days (CGD) to applied chemical N fertiliser of 1.05 CGD per kg of additional N fertilizer up to 450 kg N/ha. Similarly, Gordon (1982)[14] observed a linear response of 0.98 CGD per kg of additional N fertilizer when comparing chemical N fertilizer levels of 150, 300 and 450 kg N/ha.

AgriSearch recommends that a new research programme should be established to examine grass production responses to chemical fertilizer N application under both grazing and silage production systems.

References

Cardenas, L. M., Bhogal, A., Chadwick, D. R., McGeough, K., Misselbrook, T. H., Rees, R. M., Thorman, R. E., Watson, C. J., Williams, J. R., Smith, K. A. and Calvet, S. 2019. Nitrogen use efficiency and nitrous oxide emissions from five UK fertilised grasslands. Science of the Total Environment. 661: 696-710.

Forrestal, P. J., Harty, M. A., Carolan, R., Watson, C. J., Lanigan, G. J., Wall, D. P., Hennessy, D. and Richards, K. G. (2017), Can the agronomic performance of urea equal calcium ammonium nitrate across nitrogen rates in temperate grassland? Soil Use Manage, 33: 243–251.

Gordon, F J (1982) level of nitrogen fertiliser applied to grassland for dairy cows. Proceedings 9th Meeting of European Grassland Federation 175 -178

Higgins S, Morrison S and Watson, CJ (2012) Effect of annual applications of pelletized dolomitic lime on soil chemical properties and grass productivity. Soil Use and Management 28: 62-69.

Holmes, W (1968) The use of nitrogen in the management of pasture for cattle. Herbage Abstracts 38: 265-266

[13] Holmes, W (1968) The use of nitrogen in the management of pasture for cattle. Herbage Abstracts 38: 265-266

[14] Gordon, F J (1982) level of nitrogen fertiliser applied to grassland for dairy cows. Proceedings 9th Meeting of European Grassland Federation 175 -178

Hopkins A, Gilbey J, Dibb C, Bowling P J and Murray P (1990) Response of permanent and reseeded grassland to fertilizer nitrogen. 1 Herbage production and herbage quality. Grass and Forage Science 45: 43-55.

Jackson MV and Williams TE (1979) Response of grass swards to fertilizer N under cutting or grazing. Journal of Agricultural Science, Cambridge 92: 549 -562

Krol DJ, Forrestal PJ, Wall D, Lanigan GJ, Sanz-Gomez J and Richards KJ (2020) Nitrogen fertilisers with urease inhibitors reduce nitrous oxide and ammonia losses, while retaining yield in temperate grassland. Science of the Total Environment 725:138329

Morrison J, Jackson MV and Sparrow PE (1980) The response of perennial ryegrass to fertilizer nitrogen in relation to climate and soil. Technical Report No 27, Grassland Research Institute, Hurley

Appendix 3 Impact of proposed reductions in maximum chemical fertiliser N levels for silage swards.

300,000 ha of silage produced in Northern Ireland

Assume 50% of silage area is impacted by reduced fertiliser application

Assume 60/40 split for dairy and beef

Dairy Area 90,000 ha Assume 10,000 ha derogated, 80,000 ha non derogated.

Beef area 60,000 ha Assume 5,000 ha derogated, 55,000 ha non derogated

Reduction in yield, based on grass DM response of 20 kg DM/kg N

Dairy derogated: N reduction 210 vs 272 kg N/ha i.e. 62 kg less N = 1.24 t DM/ha less silage 10,000 ha = **12,400 t less silage DM**
Dairy non-derogated: N reduction 242 vs 272 kg N/ha i.e. 30 kg less N = 0.6 t DM/ha less silage. 80,000 ha = **48,000 t less silage DM**

Beef derogated: N reduction 150 vs 222 kg N/ha i.e. 72 kg less N = 1.44 t DM/ha less silage 5,000 ha = **7,200 t less silage DM**
Beef non-derogated: N reduction 182 vs 222 kg N/ha i.e. 40 kg less N = 0.8 t DM/ha less silage 55,000 ha = **44,000 t less silage DM**

Total reduction in silage production: 111,600 t silage DM

Assume 25% loss during ensilage/feeding, leaves 83,700 t less silage DM.

Assume half of those affected feed additional concentrates, then concentrates replace 41,850 t silage.

Additional concentrates fed = 41,850 @ 4.7 g P/kg fresh weight.

Potential additional P loading = 221.6 t P across Northern Ireland

LACK OF JUSTIFICATION OF THE CASE FOR RADICAL CHANGE

As noted above the proposals contained in this consultation represent a substantial step change in measures from the previous NAP. Previously changes from one NAP to another were evolutionary. These proposals are revolutionary in nature and will be incredibly disruptive and economically devastating.

The review of the 2019 NAP regulations published alongside (but after) the main consultation document does not seem to support the extreme measures being proposed.

While there has been a very marginal deterioration, 88.57% of sampling points for nitrates remain in the "good" category of less that 20mgNO_3/L) with only 2.86% of sites reading above 50mgNO_3/L (down from 3.57% in the previous review period). 49.64% of surface water monitoring sites showed a decrease in NO_3 levels with only 23.36% showing in increase). Page 65 of the review document also shows a steady rise in the Nitrogen efficiency of NI Agriculture from 20.2% in 2004-2006 to 26.3% in 2021-2023.

From 2021-2023 58.5% of monitoring sites in rivers were classified as "high" or "good" (up from 57.1% in 2016-2019). 80.7% of sites were table with 10.7% actually showing weak decrease in SRP levels and only 8.6% of sites seeing a weak increase. Overall, the SRP from the 499 sites is continuing to follow a long-term decreasing significant trend. As reported on page 67 of the review document the phosphorus balance of NI agriculture has also been on a steady downward trajectory.

In the presentation made at the NAP stakeholder consultation events it was noted that when the reduction in P levels of concentrates is taken into account the P Balance of NI Agriculture was just 8.2kg/ha,

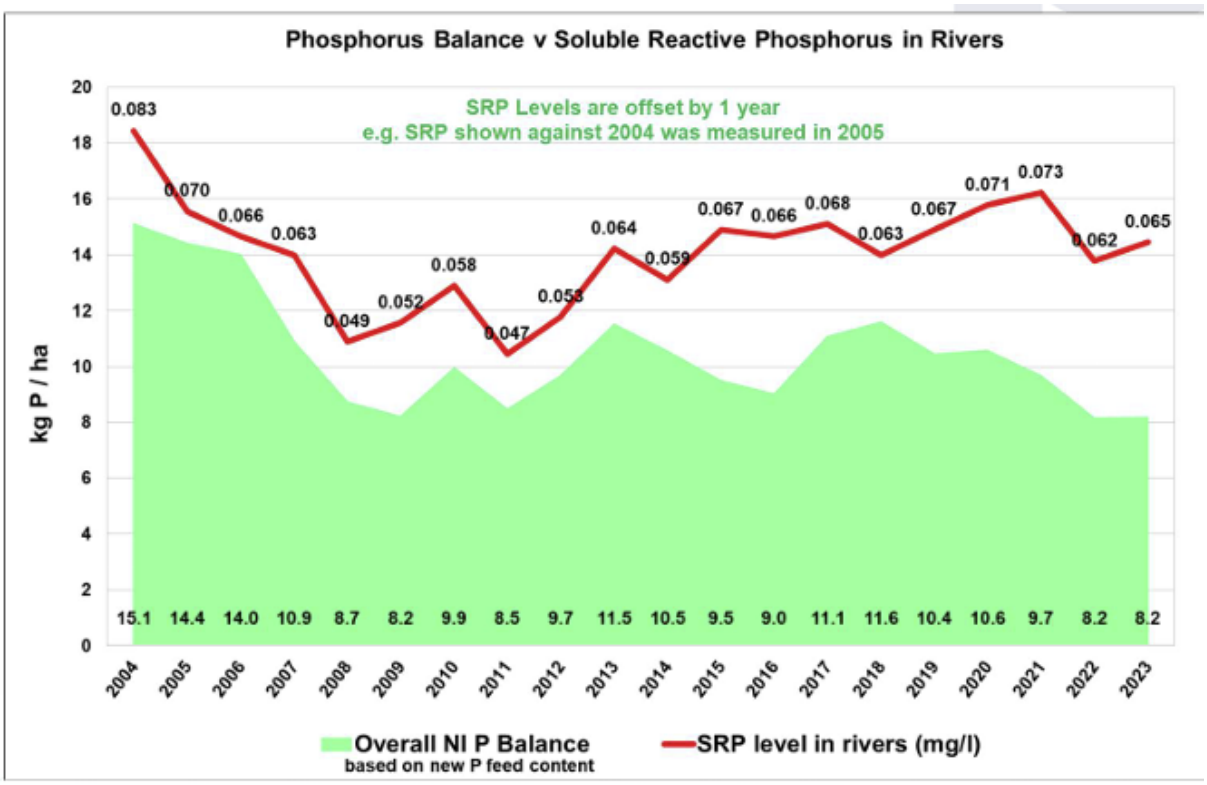

Figure 3 Phosphorus Balance V Soluble Reactive Phosphorus in Rivers

Given that the medium-term target for a future P balance is 7 kg/ha/year the measures included in the NAP proposal are clearly unjustified. New technologies such as the SULS projects are being developed which could help achieve this reduction without adversely impacting livestock production.

INTERIM ECONOMIC IMPACT ASSESSMENT OF PROPOSED MEASURES WITHIN DAERA'S NUTRIENTS ACTION PROGRAMME 2026 – 2029

Authors: Jason Rankin[15], Frances Titterington[16], Professor Gerry Boyle[17], Professor Thia Hennesey[18]

Produced in partnership with: Ulster Farmers' Union, Northern Ireland Meat Exporters Association, Dairy Council for Northern Ireland, Northern Ireland Grain Trade Association, Livestock and Meat Commission for Northern Ireland, Northern Ireland Food and Drink Association, Ulster Pork and Bacon Forum, Poultry Industry Federation.

Foreword

When the Nutrients Action Programme was launched in early May it quickly became apparent that these proposals represent a major shift in policy from DAERA which could have a major negative impact on the agri-food sector and the wider Northern Ireland economy.

Working in conjunction with stakeholders from across industry, AgriSearch developed a NAP Impact Calculator which was launched in early June. This calculator was used to collect data from a wide range of farming systems right across Northern Ireland. With the assistance of arable and horticulture representatives from the Ulster Farmers' Union the proportion of land needed for buffer strips was quantified.

At the outset, AgriSearch would like to acknowledge all those from across the NI agri-food industry who provided this data. Without their assistance this exercise would not have been possible. We would also like to acknowledge, in particular, the invaluable cooperation of Frances Titterington from the Livestock and Meat Commission for Northern Ireland who has helped greatly with the statistical analysis. We would also like to acknowledge the assistance of Professor Thia Hennessy (UCC) who provided expert advice and reviewed the report.

This exercise has been expedited by necessity to enable us to have a report to submit by the deadline for responses to the NAP consultation. However, the initial findings underline that a full independent economic analysis needs to be undertaken. It is concerning that such an analysis was not undertaken by DAERA and included in the NAP consultation documentation.

---

[15] Strategy Manager, The Northern Ireland Agricultural Research and Development Council (AgriSearch), Hillsborough

[16] Head of Sustainability, Livestock and Meat Commission for Northern Ireland, Lisburn

[17] Chair, The Northern Ireland Agricultural Research and Development Council (AgriSearch), Hillsborough; Emeritus Professor of Economics at the National University of Ireland (NUI), Maynooth

[18] Head, College of Business and Law, University College Cork.

The economic analysis presented here takes only a surface look at the impact of the NAP proposals, concentrating on the impact of Phosphorus (P) Balances and buffer strips. Other additional costs have not been included. This analysis assumes that farms will still operate but with significantly reduced stock. Such reductions in livestock will likely make the vast majority will economically unviable and unable to generate sufficient family farm income and meet their existing financial commitments (Northern Ireland farms have some £960M borrowed in loans and overdrafts). As such the figures contained in this economic impact assessment should be viewed as a conservative estimate.

At the levels of stock reductions needed to comply with the NAP proposals most of the processing facilities would become unviable and so the economic consequences would proceed up and down the agri-food supply chain to have a devastating impact on the wider Northern Ireland economy.

We understand that a second consultation process on revised proposals will follow in due course. It is imperative that a comprehensive and independent analysis of the economic impact of these revised proposals is carried out in advance of the launch of any further consultation process.

Executive Summary

The Nutrients Action Programme (NAP) proposals for 2026–2029, introduced by DAERA, represent a significant policy shift, with potentially serious economic consequences for Northern Ireland's agri-food sector. This report presents a preliminary economic impact assessment based on data from 212 farms across Northern Ireland.

Total Estimated Economic Impact of imposing P Balances and Buffer Strips

- **£1.03 billion** per annum under the 10kg/ha limit.
- **£1.56 billion** per annum under the 8kg/ha limit.

Table 13 Breakdown of Financial Impact per sector (per annum) on implementation of the 10kg/ha and 8kg/ha Phosphorus balance and buffer strips

	10kg/ha Limit	8kg/ha Limit
Pigs	£72,880,124	£77,090,144
Poultry (Layers)	£318,135,000	£330,708,000
Beef	£174,276,951	£219,402,234
Sheep	£27,555,006	£34,689,784
Dairy	£433,983,550	£897,897,000
Arable, Potatoes & Vegetables	£3,883,091	£3,833,091
TOTAL	**£1,030,713,722**	**£1,563,620,253**

Severe Economic Disruption: The proposed P balance limits of 10kg/ha by 2027 and 8kg/ha by 2029 would necessitate drastic reductions in livestock numbers or significant land acquisition, both of which are economically unsustainable for many farms.

Debt Vulnerability: With approximately £960 million in farm loans and overdrafts, and estimated annual repayments exceeding £200 million, many farms—particularly larger, more intensive operations—face heightened financial risk.

Land Market Disruption: Increased demand for land to meet P balance targets could inflate land prices and rents, disadvantaging smaller and less intensive farms and arable farms.

Processing Sector Viability: Reduced livestock numbers threaten the viability of processing facilities, potentially triggering a cascading economic downturn across the supply chain.

Social and Wellbeing Impact: The uncertainty and financial strain linked to the NAP proposals are likely to significantly affect farmer wellbeing and mental health, especially in already isolated rural communities.

Policy Gaps: The absence of a full independent economic analysis in the NAP consultation is a critical oversight.

Methodology

The 'NAP Farm Impact Calculator' was developed by AgriSearch to help farmers assess the impact of the measures proposed for the 2026-2029 DAERA Nutrients Action Programme. In addition to nitrogen loading and fertiliser allowance, the calculator works out the farm's P balance and indicates how many extra hectares or the extent of the stocking rate cut needed to achieve the 10kgP/ha proposed from 2027 and the 8kgP/ha limit proposed from 2029 *(see Appendix A for further information)*.

The tool was launched on 2nd June along with a training webinar available online to assist farmers in filling in the calculator accurately and advice provided on where the respondents' data could be found. Two hundred and twelve surveys were returned via email. To ensure a robust sample, the sampling framework for the DAERA farm business survey[19] was followed (Table 2). Although data was stratified for farm type, it was not possible to stratify within farm type due to the variation in methodology and timeframes in DAERA statistical reports. However, industry stakeholders were consulted to ensure the farms included in analysis were representative of the population.

Table 14 A breakdown of farms sampled in the DAERA Farm Business Survey (2023)[20] compared with the sample surveyed

Farm Type	Population	Sample in FBS	Surveyed
Pigs	129	7	12
Poultry	519	0	8
Dairy	2512	78	114
Cattle and Sheep (LFA)*	4268	70	66
Cattle and Sheep (lowland)*	1728	22	
Mixed	337	11	11
All	**9493**	**188**	**211**

This economic analysis takes only a surface look at the impact of the NAP proposals, concentrating on the impact of Phosphorus (P) Balances and buffer strips. For livestock farms, P Balance was determined and the resultant percentage in stock required to achieve proposed 10kg/Ha and/or 8kg/Ha P balances. Where the farm had a negative P balance, or the calculator allowed an increase in livestock at the proposed 10kg/Ha and/or 8kg/Ha P balances, it was assumed that other limiting factors on farm had influenced the stock numbers and the change in livestock figures was set to zero. The

[19] Farm Incomes in Northern Ireland 2022-23

[20] **As the land type of Less favoured Area (LFA) or Low land was not collected, 'Cattle and Sheep' were merged into one category*

average change in stock for each livestock type was used in estimations of economic impact.

The NAP Impact Calculator was developed for livestock and poultry farms only; it was recognised that in order to quantify the impact on the arable and horticulture industries in NI a different methodology was needed. This was referred to the UFU Seeds and Cereals, Potatoes, Fruit and Vegetable Committees for expert consideration. They discussed the issue and each undertook an assessment on their own farms as to how much land would be lost to the 3 metre buffer strips which would be required alongside water courses. It was estimated that an average of 2% of arable land would be lost to these buffer strips.

Other additional costs such as the purchase of low emission slurry spreading equipment (LESSE), reduction in N fertiliser usage, and administrative costs associated with the proposed new databases and record keeping requirements have not been included.

Farm business type and size were determined using the methodology published in the Farm Incomes survey 2022-23[21] *(for further information see Appendix B)*.

For the purpose of the economic impact assessment, gross margins have been used. These are taken primarily from the published DAERA farm business survey data (*for further information see Appendix C)*. it is considered appropriate to consider the effect at a gross margin level only as farmers will require a significant period of adjustment before overhead costs can be reduced.

For the purposes of this analysis, the Type 2 Gross Value Added (GVA) multiplier published by EY in a report undertaken for the Northern Ireland Food and Drink Association in 2021[22] has been used *(for further information see Appendix D)* to quantify the economy-wide effects of the economic shock to the agricultural sector. The multiplier used is the same across all of the sub-sectors of agriculture.

In this analysis the GVA multiplier is applied to the estimated loss in gross margin from each sub-sector and aggregated to estimate the economy wide impact. GVA is a measure of the output of a sector less intermediate consumption, i.e. cost of raw inputs, gross margin, while similar to GVA, is a profit measure mostly used at the business level. While GVA and gross margin are not equivalent, based on the data available for this analysis, gross margin is used as the best available measure of GVA to undertake the multiplier analysis.

[21] Farm Incomes in Northern Ireland 2022-23

[22] Food for thought: The Food and Drink industry, an inclusive sector at the heart of Northern Ireland EY (2021)

This report aims to give an overview of the economic impact of the buffer strips and the stock reduction required to achieve the proposed P balances on farm both at a sectoral and economy wide level.

Further technical information is included in the appendices.

Sectoral Impacts

Pig farms

There were 12 pig farms, of which the majority (11) were in the "Large" farm category.

Table 15 Breakdown of distribution of pig farms surveyed

	Min	Max	Mean	SD
Land area (Ha)	54	244	144	58.41
P surplus (kg)	2,440	43,669	10,261	11,322.85
P balance / ha	16	193	68	47.37
Land needed (ha) to get below 10kgP/ha	155	4141	995	1065.85
or Stock Reduction	38.5%	94.8%	77.9%	15.64%
Land needed (ha) to get below 8kgP/ha	94	5233	1025	1423.29
or Stock Reduction (%)	50.8%	95.9%	82.4%	12.51%

Table 16 NI Pig Sector Gross Margin

Pig Slaughtered in NI[23] (n)	1,496,896
Gross Margin[24] (£/head)	£25
Total NI Gross Margin	**£37,422,400**

Table 17 Impact of P Balance Limits on NI Pig Sector

	10 kgP/ha	8kgP/ha
Stock reduction needed	78%	82%
Reduction in Gross Margin	£29,152,050	£30,836,058
Multiplier	2.5	2.5
Total Economic Impact	**£72,880,124**	**£77,090,144**

[23] Source Pig(IS (PIG Information System)

[24] Estimate of Gross Margin provided by Dr Violet Wylie (based on 2024 AHDB production costs and adjusted by NI price per kg)

Poultry farms (Layers)

Only layers have been included in this analysis as steps are being taken to process and remove most broiler litter outside the agricultural system within the next few years.

There were eight layer farms, of which three were classified as “Small”, and five were “Large”

Table 18 Breakdown of distribution of layer farms surveyed

	Min	Max	Mean	SD
Land area (Ha)	16	144	54	41.26
P balance (kg)	2,192	5,077	3,450	1,216.2
P balance / ha	25	193	92	58.08
Land needed (ha) to get below 10kgP/ha	162	443	291	121.30
or Stock Reduction	60.5%	94.8%	83.5%	12.12%
Land needed (ha) to get below 8kgP/ha	220	570	377	150.29
or Stock Reduction (%)	68.4%	95.8%	86.8%	9.70%

Note that the layers sector has been expanding. The latest available official population figures are from the June 2024 DAERA Census which indicated a population of 6.4 million. This is estimated to rise to around 9 million by the end of this financial year. Thus, a relatively conservative figure of 8 million has been used for calculations. It should also be noted that the ADAS gross margin is from the conservative end of the scale. This has been adapted for Northern Ireland, from data provided by the Poultry Industry Federation of Northern Ireland by adjusting the price to current Northern Ireland prices. ADAS also include capital and interest payments and land rental value in their gross margins which is not standard practice for Northern Ireland farm business survey gross margins.

Table 19 NI Layer Sector Gross Margin

Layers in Northern Ireland (n)	8,000,000
Gross Margin (£/head)	19.05
Total NI Gross Margin	**£152,400,000**

Table 20 Impact of P Balance Limits on NI Layer Sector

	10 kgP/ha	8kgP/ha
Stock reduction needed	84%	87%
Reduction in Gross Margin	£127,254,000	£132,283,200
Multiplier	2.5	2.5
Total Economic Impact	**£ 318,135,000**	**£330,708,000**

Beef and Sheep

There were 66 Beef and Sheep respondents, of which the majority (45) were "small", "very small or hobby". There were eight "Large" Beef and Sheep farms included.

Table 21 Breakdown of distribution of beef and sheep farms surveyed

	Min	Max	Mean	SD
Land area (ha)	13	408	97	73.44
P balance (kg)	-369	12,278	1,346	2,140.34
P balance / ha	-5	170	16	28.48
Land needed (ha) to get below 10kgP/ha	-257	820	38	192.32
or Stock Reduction	0%	94.1%	22.4%	29.88%
Land needed (ha) to get below 8kgP/ha	-322	1,025	47	240.40
or Stock Reduction (%)	0%	95.3%	28.2%	32.53%

Analysis of the Beef & Sheep sector is particularly challenging as there a wide variety of enterprises and published gross margins, and the same animals could go through several different farms.

To avoid double counting, the total kilograms slaughtered have been used. This figure has been multiplied by the average price received over the last 12 months. To convert this to a gross margin, the average gross margin as a percentage of turnover for all published enterprises in the sector has been applied.

To avoid duplication for animals from the dairy sector, the total kilograms of cows slaughtered have been multiplied by 0.41 (the proportion of suckler cows in the total cow population of Northern Ireland at the June 2024 census; 226,000 beef cows versus 325,325 dairy cows).

Beef Enterprises

Table 22 Gross Margin as a Percentage of Output for Lowland NI Beef Enterprises[25]

	Output (£)	Gross Margin (£)	Gross Margin as a percentage of Output
Dairy Beef Stores (per/Ha)	1,456	502	34%
Dairy beef to Finish (per Ha)	1,874	725	39%
Beef Calves Reared & Sold as Stores	1,236	510	41%
Beef Calves Reared to Finish	1,700	796	47%
Finishing Purchased Stores	1,996	502	25%
LL Suckler Cows	592	265	45%
Average			**39%**

[25] Source DAERA Statistics (Note: As area based subsidy schemes are decoupled from production and not linked to any particular enterprise, their associated payments are not included in enterprise output. Therefore, the Gross Margin results presented exclude subsidies)

Table 23 Northern Ireland Beef output[26] (kg Cold weight) (July 2024 - June 2025)

		Total Kg Primestock (Beef)	Total Kg (Cows)
2024	**July**	8,319,721	2,541,642
	August	11,369,015	3,409,731
	September	10,791,394	2,781,973
	October	11,916,558	3,150,337
	November	14,246,001	4,345,472
	December	9,637,728	2,588,397
2025	**January**	8,319,721	2,623,859
	February	11,369,015	2,972,776
	March	10,791,394	3,337,830
	April	11,916,558	2,373,271
	May	14,246,001	2,764,415
	June	9,637,728	2,461,412
	Total	**132,560,834**	**35,351,117**
	Estimated kg beef cows (41.5%)		**14,493,958**

Table 24 Average price of Northern Ireland Beef[27] (p/kg) (July 2024 - June 2025)

		Avg. Price (Primestock Beef)	Avg. Price (Cows)
2024	**July**	468.5	314.5
	August	475.6	311.9
	September	481.6	310.8
	October	487.1	314.0
	November	492.9	316.8
	December	507.9	332.2
2025	**January**	530.4	369.6
	February	586.7	433.3
	March	628.6	471.1
	April	672.7	514.8
	May	665.8	513.2
	June	633.7	493.4
	Average	**552.6**	**391.3**

[26] Source: LMC
[27] Source: LMC

Table 25 NI Primestock Beef Gross Margin

Total kg Primestock Beef[28] (July 24 - June 25)	132,560,834
Average Price per kg	£5.526
Total Output	£732,531,169
Gross Margin as a % of Output	39%
Total NI Gross Margin	**£285,687,156**

Table 26 Impact of P Balance Limits on NI Primestock Beef

	10 kgP/ha	**8kgP/ha**
Stock reduction needed	22%	28%
Reduction in Gross Margin	£63,993,923	£80,563,778
Multiplier	2.5	2.5
Total Economic Impact	**£159,984,807**	**£201,409,445**

Table 27 NI Suckler Cows Gross Margin

Total kg Beef Cows (July 24 - June 25)	14,493,958
Average Price per kg	£3.913
Total Output	£56,714,858
Gross Margin as a % of Output	45%
Total NI Gross Margin	**£25,521,686**

Table 28 Impact of P Balance Limits on NI Suckler Cows

	10 kgP/ha	**8kgP/ha**
Stock reduction needed	22%	28%
Reduction in Gross Margin	£5,716,858	£7,197,115
Multiplier	2.5	2.5
Total Economic Impact	**£14,292,144**	**£17,992,789**

[28] Source LMC

Sheep Enterprises

Table 29 Gross Margin as a Percentage of Output for Lowland NI Sheep Enterprises

	Output (£)	Gross Margin (£)	Gross Margin as a percentage of Output
Breeding Ewes LL	150	72	48%
Breeding Ewes DA	133	59	44%
Average			**46%**

Table 30 Kilograms of hoggets / lambs sheepmeat and numbers of ewes and rams slaughtered in Northern Ireland[29] (July 2024 - June 2025)

		Hoggets / Lambs slaughtered (kg Cold weight)	Ewes & Rams Slaughtered (Head)
2024	July	708,484	2,271
	August	1,038,688	1,893
	September	948,934	2,882
	October	908,354	2,223
	November	1,062,470	2,654
	December	646,128	1,895
2025	January	588,073	1,696
	February	582,604	2,681
	March	755,239	2,624
	April	558,201	1,685
	May	724,248	2,768
	June	643,188	1,936
	Total	**9,164,611**	**27,208**

[29] Source LMC (kilograms) / DAERA (Slaughter numbers)

Table 31 Average price of hoggets and lambs slaughtered in Northern Ireland[30] (July 2024 June 2025)

		Avg Price per kg (Hoggets / Lambs)
2024	**July**	581.6
	August	614.7
	September	587.6
	October	594.5
	November	629.6
	December	667.2
2025	**January**	692.0
	February	691.6
	March	675.8
	April	678.7
	May	656.9
	June	681.4
	Average	**646.0**

Table 32 NI Hoggets / Lambs Gross Margin

Total Hoggets & Lambs (July 24 - June 25)	9,164,611
Average Price per kg	£6.46
Total Output	£59,203,387
Gross Margin as a % of Output	46%
Total NI Gross Margin	**£27,233,558**
Estimated Gross Margin of Hoggets & Lambs Slaughtered in RoI & GB (72.6% of NI kill)	**£19,773,924**
Total Gross Margin of NI Hoggets and Lambs	**£47,007,482**

Table 33 Impact of P Balance Limits on NI Hoggets / Lambs

	10 kgP/ha	8 kgP/ha
Stock reduction needed	22%	28%
Reduction in Gross Margin	£10,529,676	£13,256,110
Multiplier	2.5	2.5
Total Economic Impact	**£26,324,190**	**£33,140,275**

[30] Source LMC

Table 34 NI Ewes & Rams Gross Margin

Total Head (slaughtered) Ewes & Rams (July 24 - June 25)	27,208
Average Price per head	£120
Total Output	£3,264,960
Gross Margin as a % of Output	39%
Total Gross Margin (of Ewes & Rams slaughtered in NI)	**£1,273,334**
Estimated Gross Margin of Ewes & Rams slaughtered in RoI & GB (72.6% of NI kill)	**£924,551**
Total Gross Margin of NI Ewes & Rams	**£2,197,886**

Table 35 Impact of P Balance Limits on NI Ewes & Rams

	10 kgP/ha	**8kgP/ha**
Stock reduction needed	22%	28%
Reduction in Gross Margin	£492,326	£619,804
Multiplier	2.5	2.5
Total Economic Impact	**£1,230,816**	**£1,549,509**

Mixed farms

The 11 mixed enterprise farms were mainly "Large" (eight farms). This data table is for information only. As mixed farms include a number of enterprises, they have not been included in the economic analysis for stock reduction, however stock reductions for each livestock type are expected to be in line with those stated previously. Eight of the mixed farms included a Dairy enterprise, the predicted change in milk production has been included in the dairy analysis as the total milk yield statistics published by DAERA do not distinguish farm type. Although this data could not be classified for inclusion in the economic analysis, it is clear that the mixed farms, on average, would have an increased demand for land and a stock reduction.

Table 36 Breakdown of distribution of mixed farms surveyed

	Min	Max	Mean	SD
Land area (Ha)	27	234	121	58.07
P balance (kg)	-5,562	21,163	2,519	6,636.33
P balance / Ha	-55	91	15	37.60
Land needed to ger below 10kgP/ha	-658	1883	131	629.44
or Stock Reduction	0.0%	89.0%	27.5%	36.16%
Land needed to get below 8kgP/ha	-823	2354	164	786.79
or Stock Reduction	0.0%	91.2%	32.3%	39.07%

Dairy Farms

There were 114 farms which were classified as Dairy, the vast majority of dairy farms included were "Large" (108). In addition to the dairy farms, there were eight "Mixed" and one Poultry farm which also produced milk.

Table 37 Breakdown of distribution of dairy farms surveyed

	Min	Max	Mean	SD
Land area (ha)	50	364	147	45.54
P balance (kg)	-3,325	9,499	2,330	1,300.87
P balance / Ha	-21	55	16	7.30
Land needed (ha) to get below 10kgP/ha	-487	656	86	123.19
or Stock Reduction	0.0%	81.9%	37.2%	16.76%
Land needed (ha) to get below 8kgP/ha	-609	820	107	153.99
or Stock Reduction (%)	0.0%	85.5%	47.8%	17.83%

The average milk yield per cow for all farm types surveyed was 8,970 l, which is slightly higher than the mean for all of Northern Ireland (with a mean of 8,291 litres). The mean national figure was derived from dividing the 2,697.19 million litres of milk produced in 2024[31] by the population of 325,325 dairy cows[32].

When weighted for farm size, the mean milk yield per cow was 9,152 l, when weighted for farm size and restricted to farm type "Dairy", the mean milk yield per cow was 8,232. However, this does not account for very small dairy farms which account for 8% of dairy farms in NI (Table 26).

Table 38 Average Milk Yield (l/cow) x farm business size of Northern Ireland Dairy Farms

	Very Small	Small	Medium	Large	Weighted mean	Mean
Proportion NI	8%	26%	23%	43%	-	-
Proportion surveyed	0.8%	2.4%	3.2%	93.6%	-	-
Dairy only	-	9,619	8,271	8,919	8,232	8,908
All milk producing farms	11,176[33]	9,656	8,271	8,957	9,152	8,970

[31] Northern Ireland Milk Price and Production April 2025.pdf
[32] 08 Agricultural Insights Sub Report
[33] Only one farm included in this "very small" category

Milk yield

Total milk yield on the farm was calculated as

$$\text{Milk yield (l)} = \text{Mean milk yield per cow} * \text{n Dairy cows}$$

Thus, where a farm required a decrease in stock numbers, the total milk yield would decrease but average milk yield per cow was assumed to stay the same.

Table 39 Total litres of milk produced and decrease in production at proposed new P levels on surveyed farms (weighted by farm size)

	Total output ('000l)					
	Part-time	**Small**	**Medium**	**Large**	**Total**	**%Reduction**
Current	2,360.3	18,289.3	25,929.7	113,831.3	160,410.5	0%
10 kg	2,360.3	15,789.4	25,929.7	69,622.9	113,702.2	29%
8 kg	0.0	2,981.0	2,981.0	47,893.2	63,847.9	60%

Table 40 Northern Ireland Dairy Sector Gross Margin

Total Dairy Cows (June 2024 Census)	325,325
Average Gross Margin (£/Cow)	£1,840
Total NI Dairy Gross Margin	**£598,598,000**

Table 41 Impact of P Balance Limits on NI Dairy Sector

	Average stock reduction calculated from Survey		Corrected change in NI Average Milk Yield	
	10 kgP/ha	**8kgP/ha**	**10 kgP/ha**	**8kgP/ha**
Proportion change	38%	49%	29%	60%
Reduction in Gross Margin	227,467,240	293,313,020	173,593,420	359,158,800
Multiplier	2.5	2.5	2.5	2.5
Total Economic Impact	£568,668,100	£733,282,550	£433,983,550	£897,897,000

Note that the proportion change in corrected average milk yield differs from the proportion change in stock reduction because of the variation in herd structure. For example, herds which required a stock reduction of less than 50% had a similar average milk yield to those which required a stock reduction of 50% or more (8,958l and 9,095l respectively) to achieve the 10kg P balance. However, the average herd size for those requiring a stock reduction of more than 50% was 346 compared with 218 for those which required 50% or less. Thus, the percentage reduction in stock for large farms has a greater effect on the total litres of milk produced.

Arable, Potatoes and Vegetables

The members of the Ulster Farmers' Union Seed & Cereals, Potatoes and Vegetable Committees discussed the issue each undertook an assessment of their own farms as to how much land would be lost to the 3 metre buffer strips which would be required alongside water courses. It was estimated that an average of 2% of arable land would be lost to these buffer strips. In the consultation document it is not clear on how the 3m buffer is to be measured nor is there clear definition of arable crops. As such, more land and more crops could be impacted.

This has been applied to the total land area for each crop from the June 2024 DAERA Agricultural Census and the gross margin applied. As the DAERA census does not split between spring and winter wheat and oats the percentages of these were estimated. Estimates were also used for crop silage and other forage field crops.

The gross margin for "mixed corn" and "other crops" was taken as an average for the cereal crops and as DAERA does not publish a gross margin for vegetables the gross margin for potatoes was used. Fruit and ornamentals were not included in the calculation.

Table 42 Impact of 3m Buffer Strips on NI Arable, Potato and Vegetable Sectors

	2024/25 Gross Margin (£/Ha)	2024 Ha	2% Loss to 3m buffer strips (ha)	Reduction in Gross Margin	Multiplier	Total Economic Impact
Spring Barley	£1,354	13,597	272	£368,128	2.5	£920,321
Winter Wheat	£2,170	7,029	141	£305,112	2.5	£762,779
Winter Barley	£1,666	6,841	137	£227,875	2.5	£569,688
Spring Wheat	£1,642	1,000	20	£32,844	2.5	£82,110
Spring Oats	£1,418	727	15	£20,619	2.5	£51,547
Winter Oats	£1,799	1,061	21	£38,168	2.5	£95,419
Mixed Corn	£1,675	87	2	£2,914	2.5	£7,285
Ware Potatoes	£2,954	3,096	62	£182,897	2.5	£457,241
Arable Crop Silage	£1,300	4,021	80	£104,546	2.5	£261,365
Other Field Crops - Forage	£1,300	3,065	61	£79,690	2.5	£199,225
Other Crops	£1,675	3,607	72	£120,817	2.5	£302,042
Vegetables	£2,954	840	17	£49,627	2.5	£124,068
TOTAL		**44,971**	**899**	**£1,533,236**		**£3,833,091**

Other Considerations

Land Impacts

For every enterprise that is affected there are three short term solutions: reduce stocking rates (which would likely render the farm financially unviable), export slurry, or acquire additional land (through rent or purchase).

Under the NAP proposals slurry exporting will become a lot more cumbersome with all exports having to be notified and verified within four days. Many beef and sheep farms are already operating close to the 150kgN/ha limit. Once this is exceeded, then the P balance rules are applied and even assuming there is "bare" ground the amount that can be exported drops from 65M^3/ha/year (14,298 gallons) to 15M^3/ha/year (3,300 gallons) (assuming standard values for 6% cattle slurry). Thus, the scope for slurry exports in the future will be extremely limited.

If implemented, the NAP proposals would lead to enormous disruption in the Northern Ireland land market, which is already overheated. While some farmers may offset livestock reductions by renting additional land, land rental rates are likely to increase and this would result in further funds being transferred from family farm businesses to inactive landowners.

Ultimately the most viable farms will be most able to secure additional land squeezing out less viable farm systems. While the beef and sheep sector and non-livestock farms may seem least affected by the current NAP proposals, as per the analysis presented here, they could lose a considerable amount of conacre land to the more intensive sectors. Vegetables and potatoes rely heavily on clean fresh conacre land for quality so this could create an even bigger issue.

Given the short timeframe in which this impact assessment has been undertaken it has not been possible to look at the wider ramifications. For example, the economy wide loss of gross value added from the agriculture sector would likely result in job losses and increased pressure on the exchequer. However, any subsequent analysis undertaken by DAERA must look at the knock-on consequences for the Northern Ireland land market.

Borrowing Commitments of Northern Ireland Farms

Many of the farmers impacted by the NAP proposals are considered to be those who have developed their businesses and are likely to be borrowers. According to Finance UK figures to the end of Q1 2025, approximately £960 million has been borrowed by NI farmers through loans and overdrafts. Assuming an average farm loan term of 10 years, annual capital repayments alone are estimated to be £96 million.

Asset finance and hire purchase must also be considered. Although those figures are not collated, an estimated total of approximately £300 million has been assumed, typically over a 5-year term. Therefore, annual capital repayments in this category are estimated to be in the region of £60 million. So total repayments across loans, overdrafts, asset finance plus borrowing from elsewhere and including interest then likely annual repayments are upwards of £200m per annum. If those bigger units across dairy, beef finishers, pigs and poultry are to meet the P balance targets and in turn be forced to either destock and/or rent more land than their ability to meet debt never mind continue to invest in their business could become unsustainable. DAERA need to take these issues into account when carrying out their Economic Impact Assessment of the revised proposals.

Conclusions

The findings of this economic impact assessment raise serious concerns about the future viability of farms given the proposed Nutrients Action Programme (NAP) phosphorus (P) balance limits for 2026–2029 and imposition of buffer strips on arable land. The data, drawn from a wide cross-section of Northern Ireland farms, clearly demonstrates that the implementation of these measures—particularly the 8kgP/ha threshold—would result in:

- **Widespread economic disruption** across the agri-food sector and the wider economy, with projected losses exceeding **£1.56 billion per annum**.
- **Limit the resilience and competitiveness** of the Northern Ireland family farm. Improved productivity was one of the four key policy objectives of DAERA**.** This could further exacerbate the economic gap between the farm and non-farm economy - rural and urban communities and act as a further disincentive for young people to enter farming.
- **Severe financial strain** on farm businesses, many of which are already carrying significant debt burdens.
- **Destabilisation of the land market**, with increased competition for land likely to disadvantage smaller and less intensive farms and non-livestock farms.
- **Threats to supply chain resilience**, as reduced livestock numbers could render processing facilities economically unviable.
- **Wider impact on rural communities** dependent on the agricultural sector for economic activity.
- **Further weaken the food security and food sovereignty** of the United Kingdom by reducing domestic production and increasing reliance on imported produce.

These outcomes would not only undermine the economic sustainability of Northern Ireland's rural economy but also risk unintended social and environmental consequences.

Appendix A - Phosphorus (P) balance

The respondent was required to enter the P inputs (Livestock purchased; slurry / manure imports; purchased feed; purchased P fertiliser) and P outputs (Livestock sold, produce sold, slurry and manure exports). This data was used to calculate the P surplus.

$$\text{P surplus (kg)} = \text{Total P inputs (kg)} - \text{Total P outputs (kg)}$$

This was further used to calculate the P balance (kg/Ha) using the formula:

$$\text{P balance (kg /Ha)} = \frac{\text{P surplus (kg)}}{\text{Farm area (Ha)}}$$

Predictions of the Land change required (Ha) to achieve the desired P balances of 10kg/Ha and 8kg/Ha using the formula:

$$\text{Land change (Ha)} = \frac{(\text{P surplus (kg)}) - (\text{Farm Area Ha} * \text{Desired P balance (kg)})}{\text{Desired P balance (kg)}}$$

The change in Livestock on farm was calculated using a proportional reduction model, which calculated the percentage reduction of the total current P surplus required to achieve the desired P balance:

$$\text{Livestock population change}(\%) = \frac{(\text{P surplus} - (\text{Farm Area} * \text{Desired P balance}))}{\text{P surplus}}$$

Appendix B - Farm business type and size

Farm business type and size were determined using the methodology published in the Farm Incomes survey 2022-23[34]. This assigned a farm business type by converting the average annual animal populations to Standard output (SO) units. Where an enterprise accounted for more than 66.6% of SO from the farm, this was assigned as the main enterprise; if a farm had no main enterprise, it was allocated as 'Mixed'. The farm business survey has stratified beef and sheep farms into lowland and less favoured areas, but in this analysis the land type data was not available and as a result Beef and Sheep Lowland and LFA are combined.

Farm business size was determined from the standard labour requirement (SLR) to manage the livestock on farm, calculated as the sum of each livestock type on farm multiplied by the appropriate SLR coefficient. The SLR and SO coefficients used are listed in the Appendix. The DAERA farm census uses a similar method for stratification, but combines "Hobby" and "very small" into one group[35], the farm types reported in the census are compared with the reported farm break down in NI 2024.

Table 43 Breakdown of Northern Ireland farm size by sector

	Farm size							
	Very Small		Small		Medium		Large	
Farm Type	**NI**	**Sample**	**NI**	**Sample**	**NI**	**Sample**	**NI**	**Sample**
Pig	30.6%	0.0%	13.9%	0.0%	13.9%	8.3%	41.7%	91.7%
Poultry	21.5%	0.0%	36.8%	37.5%	21.6%	0.0%	20.1%	62.5%
Beef and sheep	89.6%	34.8%	10.1%	33.3%	2.3%	19.7%	1.5%	12.1%
Dairy	8.1%	0.0%	26.0%	1.8%	22.6%	3.5%	43.3%	94.7%
Mixed	56.9%	9.1%	14.8%	18.2%	8.2%	0.0%	20.1%	72.7%

[34] Farm Incomes in Northern Ireland 2022-23

[35] Census methodology

Appendix C - Use of Gross Margins

For the purpose of the economic impact assessment, gross margins have been used. These have been taken primarily from the published DAERA Farm Business Survey data[36]. However, as the most recent published set of gross margin data is from the 2022/23 financial year, adjustments have been made based on the changes in agricultural income observed over the past two years.[37][38].

Table 44 Northern Ireland Farm Business Survey Gross Margins adjusted by changes in agricultural income

	2022/23	2023/24 Adjustment	2023/24	2024/25 change	2024/25
Gross Margins Expressed per Head					
Dairy Cows	1680	-70%	504	191%	1467
Suckler Cows (non LFA)	282	8%	305	36%	414
Ewes Non LFA	72	8%	78	36%	106
Pigs - Birth to Bacon	40	84%	74	2%	75
Gross Margins Expressed per Hectare					
Dairy Beef Stores (per/Ha)	502	3%	517	49%	770
Dairy beef to Finish (per Ha)	725	3%	747	49%	1113
Beef Calves Reared & Sold as Stores	510	3%	525	49%	783
Beef Calves Reared to Finish	796	3%	820	49%	1222
Finishing Purchased Stores	502	3%	517	49%	770
Crops					
Spring Barley	1220	-81%	232	484%	1354
Winter Wheat	1956	-81%	372	484%	2170
Winter Barley	1501	-81%	285	484%	1666
Spring Wheat	1480	-81%	281	484%	1642
Spring Oats	1278	-81%	243	484%	1418
Winter Oats	1621	-81%	308	484%	1799
Ware Potatoes	2662	-81%	506	484%	2954

[36] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Farm%20Performance%20Indicators%202022-23.PDF
[37] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/STATISTICAL%20PRESS%20RELEASE%20INCOMES%202023%20with%20tables.pdf
[38] https://www.daera-ni.gov.uk/sites/default/files/2025-06/STATISTICAL%20PRESS%20RELEASE%20INCOMES%202024%20with%20tables_0.pdf

On closer examination the adjusted pig gross margins did not reflect the current reality in Northern Ireland, so the AHDB gross margins were used and adjusted for the pig meat price paid in Northern Ireland.

The 2024/25 gross margins for dairy were considered to be low. Advice was provided by private consultants from the dairy sector, indicating that gross margins for the 2024/25 year were, on average, £160 higher than in 2022/23. Consequently, a gross margin of £1,840 per cow for dairy farms (£1,680 + £160) was applied.

DAERA do not publish gross margin figures for layers, so ADAS figures were used and adjusted for local market conditions.

Appendix D - Use of Multipliers

It is widely recognised that the economic impact of farming extends well beyond the farm gate—an effect commonly referred to as the "multiplier effect." For the purposes of this analysis, the Type 2 GVA multiplier published by EY in a 2021 report for the Northern Ireland Food and Drink Association has been used[39].

The published multiplier for "Products of agriculture and related services" is 2.5 and this has been used in this economic analysis. This is the fifth highest multiplier in the Northern Ireland economy. It should also be noted that the "Food Products" multiplier is even higher at 3.1 (the third highest in the Northern Ireland economy). To avoid duplication this multiplier has not been used in this impact assessment.

[39] Food for thought: The Food and Drink industry, an inclusive sector at the heart of Northern Ireland EY (2021)

Appendix E - Standard outputs coefficients

Table 45 Standard outputs coefficients

Item	Calculator reference	Unit	Standard Output
Dairy cows	Dairy Cows	head	2589
Beef cows	Suckler Cows	head	511
Bulls/ steers 2y+	Breeding Bulls	head	569
Other cattle 2y+	Cattle > 2 Years	head	497.5
Other cattle 1-2y	Cattle 1-2 Years	head	530.5
Bulls/steers 1-2y	Bull Beef (0-13 months)	head	584
Calves <1y	Cattle 0-1 years	head	545
Ewes	Ewe >1 yr	head	109
Other sheep	Ram >1 year	head	24
Lambs	Lambs 0-1 years	head	0
Other pigs	Boar	head	241
Other pigs	Maiden Gilt	head	241
Sows	Breeding Sow	head	934
Piglets (<20kg)	Pigs weaned at 3-4 weeks 6 to 8 18 (7.5 Weeks)	head	107
Piglets (<20kg)	Pigs weaned at 3-4 weeks 6 to 8 35 (11 weeks)	head	107
Piglets (<20kg)	Pigs weaned at 3-4 weeks 6 to 8 105 (23 weeks)	head	107
Other pigs	Growing & Finishing Pigs 18 35	head	241
Other pigs	Growing & Finishing Pigs 18 105	head	241
Other pigs	Growing & Finishing Pigs 36 105	head	241
Hens	Pullets	head	22.22
Hens	Layers	head	22.22
Hens	Free range laying hens	head	22.22

(Source DAERA)

Appendix F - Standard labour requirements coefficients mapped to DAERA coefficients

Table 46 Standard labour requirements coefficients mapped to DAERA coefficients

Item	Calculator reference	Unit	Standard Labour Requirement (Hours)	Units per 1900 hours
Dairy cows	Dairy Cows	head	39	49
Beef cows	Suckler Cows	head	12	158
Other cattle	Breeding Bulls	head	9	211
Other cattle	Cattle > 2 Years	head	9	211
Other cattle	Cattle 1-2 Years	head	9	211
Other cattle	Bull Beef (0-13 months)	head	9	211
Other cattle	Cattle 0-1 years	head	9	211
Ewes and rams: Lowland	Ewe >1 yr	head	5.2	365
Ewes and rams: Lowland	Ram >1 year	head	5.2	365
Other sheep: Lowland	Lambs 0-1 years	head	3.3	576
Other	Boar	head	1.3	1462
Sows and gilts	Maiden Gilt	head	16	119
Sows and gilts	Breeding Sow	head	16	119
Piglets	Pigs weaned at 3-4 weeks 6 to 8 18 (7.5 Weeks)	head	1	1900
Piglets	Pigs weaned at 3-4 weeks 6 to 8 35 (11 weeks)	head	1	1900
Piglets	Pigs weaned at 3-4 weeks 6 to 8 105 (23 weeks)	head	1	1900
Piglets	Growing & Finishing Pigs 18 35	head	1	1900
Piglets	Growing & Finishing Pigs 18 105	head	1	1900
Piglets	Growing & Finishing Pigs 36 105	head	1	1900
Pullets	Pullets	head	0.12	15833
Laying hens	Layers	head	0.17	11176
Laying hens	Free range laying hens	head	0.17	11176

(Source DAERA)

AGRISEARCH DETAILED OBSERVATIONS ON PROPOSED CHANGES TO THE NUTRIENTS ACTION PROGRAMME

In the internal review process DAERA has not taken account of practical considerations, economic impact and wider impact on rural communities during their deliberations.

While DAERA have outlined that *'the draft regulations are indicative of proposed revisions, they have not been scrutinised by the Departmental Solicitor's Office (DSO) and may, therefore, be subject to drafting revisions after scrutiny'*. The failure to have the regulations at a final draft stage makes it difficult to comment comprehensively on the measures that are proposed.

AgriSearch views on each of the new proposals are outlined in the following sections. It has been difficult to properly consider these proposals given the lack of information and inconsistencies with the draft regulations and therefore comments are made without prejudice.

Water Protection: intercepting / breaking nutrient pathways

Uncultivated buffer requirement

WP1 - The Department proposes the requirement for a 3 m uncultivated buffer alongside a waterway in arable fields, from 1 January 2026. AgriSearch opposes this proposal.

As there is insufficient detail in the consultation paper including missing definitions and explanatory text it is difficult to assess this proposal appropriately.

The regulations or consultation paper provide no definition of an arable field. The 'Review of the 2019 NAP measures' document on page 238 references 'arable fields where there is bare soil', the SEA also mentions 'where there is bare ground' yet that is not clear from the current proposal. It is also important to note that there will only ever be bare soil for a short period of time therefore how could this be assessed by an inspector.

The definition of arable fields is critical to allow proper consideration of this measure and its potential impact. Farmers will be familiar with the current definition of 'arable land' within the Basic Payment Scheme and preceding schemes as outlined below.

[40]Arable land

Arable land is land used to grow crops other than grass and permanent crops such as orchards, short rotational coppice, miscanthus, ornamentals and nurseries, and multi-annual crops. Forage crops such as maize, fodder beet, fodder rape, stubble turnips or any cereal crop used for forage are also regarded as an arable crop use. Sainfoin, clover, lucerne and forage vetches are regarded in the same way as grass and therefore are not deemed to be an arable use.

If your land will be used to grow an arable crop in this scheme year or has been used to grow an arable crop in any of the previous five years, then it will be classified as arable in this scheme year. Land used to grow grass in this scheme year, but which has been used to grow an arable crop in any of the previous five years, i.e. temporary grassland, will also be classified as arable in this scheme year.

Areas available for crop production but lying fallow, including areas set aside under EU schemes, in any of the previous five years will also be classified as arable land. Fallow land in grass for six consecutive years will be classified as permanent grassland.

This definition would bring in significantly more fields requiring buffer strips to be provided and more information as to what DAERA consider an arable field to be in this context is needed to allow full commentary on this proposal. In most schemes, DAERA use data from submissions from the previous year's Single Application Form and therefore normally pre-populated information is a year out of date in relation to land use. This further complicates this issue as this will be inaccurate and unrepresentative for analysis and use within the current farming year

It should also be noted that this proposal contradicts the Farming with Nature Transition Scheme (FwNTS) which opened on 23 June 2025. The FwNTS will fund 2m buffer riparian buffer strips on farms and fenced off. The 2m distance was selected as it was felt it as an appropriate balance of providing some protection to water bodies, enhancing biodiversity while supporting production and where appropriate allowing Rivers Agency or farmers to maintain the waterways. This highlights the lack of joined up thinking within DAERA where one division is promoting and financially supporting riparian buffer strips and working with the industry to design the specification around these while another part of DAERA is mandating. It is also clear that there has been a lack of internal engagement within DAERA on buffer strips which is concerning. There are obvious questions around how this will operate, it will clearly result in confusion, and can farmers be paid for something that will potentially be a legal requirement.

There are also concerns around the new definition of a waterway using an online 1:5000 map. Feedback suggests that the 1:5000 maps include some dry sheughs and drains

[40] https://www.daera-ni.gov.uk/publications/guide-land-eligibility-2024

creating another layer of confusion. It should also be noted that not all farmers will be able to access online 1:5000 maps and from some initial trials it is not an easy mapping system to use and brings another layer of complexity given the various mapping and Geographical Information Systems (GIS) that are already required to be used by farmers.

If imposed, it is also unclear where the 3m buffer zone is to be measured from, the waterline or the edge of the bank for example. This again makes it difficult to assess impact. There is also no account taken of risk. There will be fields with natural bunding or slope that would prevent runoff from entering a waterway and this needs recognised should this measure be imposed on the industry.

The science supporting this measure needs further investigation. The Strategic Environmental Assessment (SEA)[41] notes in relation to buffers that the 'efficacy is uncertain'. Given the questions around the potential for buffers to remove sediment and the ranges outlined in the SEA, more work needs to be done in this area before any proposals are adopted into legislation. Questions also need to be asked around whether riparian buffer strips are the most effective mechanism and whether more adaptable buffers using the LiDAR risk maps supported through an agri-environment scheme are a more appropriate and efficient method of tackling run off and sediment loss from fields.

There is the potential for this proposed measure to result in a considerable loss of land area and this may have been totally underestimated in the Regulatory Impact Assessment depending on the definitions used by DAERA for arable fields and how the buffer was measured. Farmers have raised concerns that there could be a significant loss of productive land area to unproductive buffer strips and therefore will have an economic impact on some farms that has not been appropriately considered. The economic loss also will depend on the crop grown in the field. Farmers have estimated that around 2% of arable land could be lost due to this measure with no economic compensation on offer. AgriSearch estimates that the direct loss of margins would amount to over £1.5 million per year. When multipliers are applied this represents a total loss to the economy of over £3.8 million per year.

AgriSearch has concerns about the spread of weeds and Noxious Weeds from these uncultivated buffer margins and the inclusion of the word 'unharvested' raises concerns that these areas cannot be topped to keep weeds under control as is required by the Noxious Weeds (Northern Ireland) Order 1977[42]. Pests such as slugs, wireworms and leatherjackets will flourish in these areas. Questions have also been raised about the potential for grazing these areas to control unwanted species. The resulting impact is

[41] https://www.daera-ni.gov.uk/sites/default/files/2025-04/DAERA%20NAP%20-%20Strategic%20Environmental%20Assessment.PDF Page 164-165

[42] https://www.legislation.gov.uk/nisi/1977/52

likely that more plant protection products (PPP) will be needed to be applied in the adjacent field areas to control spread of weeds resulting in additional costs and amount of chemicals applied. There are also questions as to whether in the applicable fields, these buffer strips will be considered the new field boundary and therefore current buffer restrictions for the application of PPPs and/or fertilisers will apply from that point.

We would also highlight that farmers could be deterred from growing crops due to loss of productive land to these buffer strips, an unintended consequence given that arable crops have the potential to 'mine' phosphorus from soils above optimum and an outlet to redistribute livestock manures in some cases.

Field size is also important in that small fields surrounded by waterways could lose a considerable percentage of productive area and could make smaller fields unviable from arable crops. This again could result in farmers requesting hedge removal consent to enlarge existing fields.

If imposed, annual crop rotations will result in these buffer strips being ploughed up on a regular basis when grass leys are reintroduced. This removes any environmental benefits these buffers might have provided in terms of biodiversity and with questions around the efficacy of buffer strips in relation to water quality the UFU question why DAERA are considering this approach. It is also difficult to understand, due to the lack of a clear definition of arable fields, how this proposal if imposed would be enforced.

Alternative: The Environmental Farming Scheme has clearly demonstrated that the fencing off watercourses and creating buffers is an attractive and popular measure for farmers. There has also been similar positive uptake with this option within the Sustainable Catchment Programme. A preferable approach would be to continue to incentivise riparian buffer strips through the new Farming with Nature Scheme and encourage farmers with higher risk fields to participate voluntarily and to also consider adaptable buffers in this scheme.

Storage of Silage Bales

WP2 - *From 1 January 2026, the Department proposes to revise the requirements for the storage of silage bales in field, by increasing the distance from a waterway to 20 m and if stacked, not more than two bales high*.

AgriSearch has major concerns around this very significant change. This also goes beyond what England, Wales and ROI require and making it illegal to stack silage bales no more than two high appears excessive. This will cause significant practical issues for farmers and will also have a disproportionate impact on smaller farmers. There is no definition of silage bales and it is therefore unclear if this also includes haylage.

DAERA have not provided any scientific evidence that the stacking of silage bales is causing issues. The consultation document outlines that *'stacking of silage bales greater than two bales high increase the risk of effluent'* yet they have provided no evidence to back up this statement. It is widely accepted that there is much lower risk of effluent when silage is stored in bales than when stored in silo pits due to a higher percentage dry matter.

Published research (Durr et al, 2004 Grassland Science in Europe 9: 894-896) indicates that 'no leaking effluent was observed for round bale silage with a DM content of more than 250 g/kg.'

There is no justification to limit the stacking of big bale silage, if DM content is greater than 250 g/kg, as there is no risk of effluent pollution.

There are also issues around what 'in field' means as may businesses use areas that may not be defined by DAERA as 'fields' to store silage bales but where there is no risk of effluent pollution.

20m from a waterway is a significant distance and may not be achievable using the current NAP definition of a waterway forcing farmers to construct expensive an unnecessary storage.

Farmers will select a location for big bales based on Health and Safety, convenience to livestock housing, accessibility for machinery. There will often be limited alternative safe locations on farms. If bales cannot be stacked more than 2 high, then those farmers who currently operate more than 2 high could struggle to find accessible and appropriate areas on farms.

The consultation document also refers to not locating bales on 'critical risk pathways to waterways'. It outlines that farmers who participate in the DAERA Soil Nutrient Health Scheme (SNHS) can use their run-off maps to determine where this critical risk pathway exists. It is unclear whether this is good practice guidance or to become a legislative requirement. This clause has not been included in the draft regulations again making it difficult to understand how DAERA intend to implement this aspect. Not all farms will participate in the SNHS so will not have run off risk maps available for their farm therefore this would create inequalities. It should also be noted DAERA have given a written commitment that they will not data and information from the SNHS to regulate farmers therefore these maps could not be used by the regulator (NIEA) to enforce this element if DAERA was to mandate it.

Reduction of maximum value of slurry that can be applied at the shoulders of the season

WP3 - *The Department proposes to reduce the maximum volume of slurry which can be applied during February and between 1st-15th October from the current figure of 30 m ^{3} per hectare per single application to 25 m^3*

There has also been no scientific evidence presented to justify this further restriction. These periods already have reduced slurry spreading limits which recognises the (average) higher risks and lower growth potential of these time periods and no case has been made to justify lowering it further.

Modelling undertaken by AFBI as part of the GrassCheck project[43] has highlighted that there will be increased growth in the shoulders of the season in the future. This will increase the potential for nutrient uptake during the above time periods. Spreading conditions in February can often be better than those later in the season.

As technology develops and allows more precision farming, DAERA must revisit the current closed period. More flexibility is needed and a move towards spreading when soil and weather conditions are appropriate regardless of the date.

Additional Phosphorus Controls

Further restrictions on the use of chemical P fertilisers on grassland

The Department proposes to introduce further restrictions on use of chemical fertiliser containing phosphorus on grassland. Use will be restricted to the following criteria: grass reseeding, establishment of clover, where a farm has deficit of phosphorus that cannot be met by import of organic manures/fertilisers or chemical phosphorus is needed for animal health reasons, Soil analysis and a nutrient management plan demonstrating a crop requirement is also required.

An exemption and supporting evidence to allow use under the above criteria must be registered with NIEA. This measure will come into operation from the commencement of the Regulations. Action 23 of the Lough Neagh Action Plan.

AgriSearch has significant reservations about these proposals and their potential impact on farms.

AgriSearch supports the principle of only using chemical P where and when it is required. This is good farming practice and considerable efforts have gone in by both

43 https://agrisearch.org/pdfjs/web/viewer.html?file=%2Fdownload%2Ffiles%2FGrassCheck%5F25th%5FAnniversary%5FConference%5F%28Slide%5FDeck%29%2Epdf

DAERA and agri-food stakeholders around increasing knowledge and awareness of farmers around good nutrient management. AgriSearch has put in considerable resources to this aim conducting both a review of the Nutrient Planning Tools[44] and participating and investing in a DAERA co-funded Digital Catapult Tenfold Project looking at the use of data visualisation tools[45]. We would encourage DAERA to produce Nutrient Management Planning Tools that can be easily accessed and utilised by farmers on a day-to-day basis.

AgriSearch recognises the potential of organic manures to meet the majority of phosphorus requirements of grassland and arable crops in Northern Ireland. However, the redistribution of organic manures is a major challenge which has not been fully recognised. For example, on some farms it is impractical to import slurry or other organic manures onto some areas of the farm to satisfy P demand due to steep slopes or accessibility issues. AgriSearch are also concerned that this proposal does not take account of farm biosecurity issues. For example, there is considerable concern regarding the potential for disease transfer between farms linked to movement of organic manures, in particular, regarding bovine tuberculosis, Johnes Disease, salmonella and botulism. Johne's disease and other production diseases evidentially increases GHG emissions in milk on a per litre basis and so withdrawing chemical P from grazing land but targeting organic manures could also have wider implications.

This a key part of the Soil Nutrient Health Scheme (SNHS) where farmers are provided with soil analysis results and the training to interpret these results and make appropriate nutrient management decisions. It is unusual that even though the SNHS testing regime is only 75% complete and about 25% of farmers trained, DAERA are proposing to mandate tighter rules on chemical P before that initial SNHS education / knowledge transfer process of is complete.

The consultation paper focuses on the use of chemical P on grassland however the draft regulations do not differentiate between grass and non-grass crops. This again makes it difficult for Stakeholders to constructively comment on the proposals given the lack of clarity.

It is incorrect to suggest that there are enough organic manures in Northern Ireland to supply phosphorus demands without the need for chemical P. There are several issues that need to be considered for various sectors:

---

[44] https://agrisearch.org/pdfjs/web/viewer.html?file=%2Fdownload%2Ffiles%2FNMPTreview%5FNorthernIrelandforagecrops%5Ffinalreport%5Frevised13%5F11%5F2023%2Epdf

[45] https://www.daera-ni.gov.uk/news/daera-and-digital-catapult-event-showcases-how-collaboration-and-innovation-can-help-industry

- Practicality issues (as noted above)

- Biosecurity / animal health issues (as noted above)

- Generally, vegetable and fruit farmers are unable to use organic manures to satisfy their crop demand due to rules associated with those supply chains. Some industry standards will permit organic manures to be used if they meet PAS 110 standards however this is onerous and at present only tends to be adopted by some anaerobic digestion plants. These standards are required for these sectors for human health reasons to remove risks of Ecoli and Salmonella.

- There are also issues with the persistence of the herbicide Forefront-T. It is recommended that organic manures from animals fed from grass treated with Forefront-T should stay on farm and should only be spread onto grassland. If the manure is applied onto arable fields, trace residues can have an impact on sensitive crops such as beans, potatoes and vegetables. Potatoes, sugar beet, fodder beet, vegetables, beans and other legumes (including white and red clover) can only be planted in the second calendar year following Forefront=T treatment.

- The use of digestate is also highlighted as an alternative way to redistribute organic manures however farmers have reported that livestock can be reluctant to graze forage after spreading with some types of digestates with the suggestion that there is a taint left which is unpalatable to some animals and therefore has a negative impact on efficiencies and production. Further research is needed in this area.

Animal Health Issues: DAERA outline that chemical P can be used if it is needed for animal health reasons however again no detail is given on how this could be implemented. How does a farmer know if there is a requirement? Is this based on P balances, an animal showing signs of deficiency, veterinary reports or some other mechanism? Again, without details it is difficult to comment on this proposal, but AgriSearch would have very serious reservations about a policy which favours waiting until deficiencies arise and therefore creating welfare problems on farms. It should also be noted that if there appears to be P deficiency on forage then farmers may opt to supplement this with animal feeds – resulting in a perverse outcome.

AgriSearch are also concerned regarding the potential for P deficiency in livestock on some farms, particularly those who have adopted zero P fertiliser application and

reduced P levels in animal feed. For example, Ferris et al (2010)[46] (Animal 4; 560 – 571) in a survey of 36 farm silages across Northern Ireland observed P concentrations ranging from 1.4 to 3.9 g/kg DM – this contrasts with the author of the paper's recommendation of P levels in the overall diet of dairy cows of 3.5 – 3.9 g/kg DM. On farms feeding low levels of concentrates, there is potential for P deficiency to occur. Whilst DAERA have proposed that chemical P fertiliser can be used for animal health reasons, no guidance is provided on how this will be determined. AgriSearch recommends that the proposal on use of chemical P should be based on forage P analysis, with provision for its use when forage P deficiency has been identified.

Establishment of Clover: AgriSearch has undertaken a considerable amount of research, innovation and demonstration on the use of clovers in grassland swards. Clovers have a particularly high requirement for phosphorus which needs to be recognised. It is very important to avoid compacting a seed bed, particularly when establishing red clover. It would therefore be impractical on most occasions to use slurry or organic manures as a seed bed fertiliser. It should also be noted that such manures may contain relatively high levels of Nitrogen which is not desirable in these circumstances as it will enable the grass to outcompete the clover during the critical establishment phase.

Non-grass crops: These have a greater demand for chemical P and therefore effectively banning this as the draft regulations suggest would make it extremely difficult and bureaucratic for those farmers. Apples require high soil P indices in order to ensure that the fruit can be stored long-term. Foliar applications of phosphate are also typical. Other crops such as potatoes have a significant demand for phosphorus and chemical P will be needed to achieve optimum yields There needs to be a clear differentiation between the requirements for grassland and non-grass crops. Currently non-grass crops are operating to crop requirement using the NAP 2019 fertiliser P limits which are based on RB209, fertiliser is purchased on this basis and therefore no additional restrictions require to be imposed. Requiring non-grass crops to register / seek exemptions for P fertiliser would mean that all arable and horticultural operators would require this for every crop which would be a significant burden on both NIEA and farmers. Non-grass crops should be automatically exempt from requiring permission to use chemical P.

46 https://www.researchgate.net/publication/221972838_Effect_of_offering_dairy_cows_diets_differing_in_phosphorus_concentration_over_four_successive_lactations_1_Food_intake_milk_production_tissue_changes_and_blood_metabolites

SNHS Results: Some farmers have expressed concerns around the accuracy of some SNHS results and are worried that these do not reflect current levels of soil P in many areas. While AFBI do offer a re-test service on request, it is important that farmers have confidence in these results going forward.

Alternative: DAERA should continue to permit the use of chemical P on non-grass crops without the need for stricter criteria as in the current NAP 2019-2022.

DAERA could consider only banning chemical P blends/compounds on grassland but permitting the use of straight phosphorus to top up crop requirement without needing an exemption. This product is more specialised and expensive and is unlikely to be used on any farm where it is not required. This would permit the use of chemical P where it is needed on grassland and remove the habitual grassland users of chemical P fertiliser without the added bureaucracy outlined above.

Introduction of a Farm Phosphorus Balance limit for more intensively stocked farms

APC 2 - *The Department proposes to introduce a Farm Phosphorus Balance limit for more intensively stocked farms. Defined as those with annual livestock manure nitrogen production at and above 150kg N/ha per year. There are approximately 3100 farms in this category, in addition to derogated farms where a limit of 10 kg/P/ha/year already applies. The purpose of this limit is to reduce surplus phosphorus and limit the buildup of excess soil phosphorus levels. The limit would be phased in as follows:*

i. 2027 – limit of 10 kg/P/ha/year
ii. 2029 – limit of 8 kg/P/ha/year

These limits will also apply to any farms that are producing less than 150 kg/N/yr but subsequently import manure leading to a total N loading (N produced plus N imported) of 150 kg/N/yr and above.

The limit of 10 kg/P/ha/year which already applies on derogated farms will reduce to 8 kg/P/ha/year in 2029 in line with ii above.

Farms will be required to submit annual records to NIEA to demonstrate compliance with the P Balance limit.

These limits will be reviewed in 2029 and as part of the next NAP review. If necessary, lower limits will be set for the subsequent NAP (2030-2033) to achieve the 2033 objective of an overall phosphorus surplus for the Northern Ireland agricultural sector

of no more than 7 kg/P/ha/year. Factors to consider in determining the need for lower limits in NAP 2030-2033 include:

- *Reductions achieved in the overall phosphorus surplus for the Northern Ireland agricultural sector.*
- *Water quality status, particularly SRP levels*
- *Capacity developed for slurry processing facilities and phosphorus export*
- *Any reductions achieved in phosphorus inputs from WWT or other inputs.*

This significant addition to the NAP would appear to have discrepancies between what is proposed in the consultation paper and included in the draft regulations. Table 45 Comparison of consultation P balance requirements and draft regulations highlights those differences and depending on what figures are to be used will have a significant difference on how farms are impacted by this onerous measure.

Table 47 Comparison of consultation P balance requirements and draft regulations

Phased in by:	Consultation	Draft Regulations
2027	10kg P /ha / year	12kgP/ha/year
2029	8 kg P /ha /year	10kgP/ha/year

There is also a discrepancy between the consultation proposals and draft regulations in terms of how this is to be enforced. The consultation paper suggests on page 15 that farms will be required to submit annual records to NIEA to demonstrate compliance. No date or methodology for doing so is outlined resulting in difficulties assessing the impact of the administrative burden. To complicate this further, the regulations state that P balance records should be retained on the holding.

Challenge to Assumptions on Agriculture's Contribution to P Inputs to Waterways

DAERA indicate on Page 16 of the consultation document that the rationale for introducing this measure is to reduce P losses from agriculture and state that 'It is estimated that 62% of the phosphorus inputs to waterways are from Agriculture.'

AgriSearch challenge this statement, which specifically targets the agri-food sector. The data which are used to support this statement appear to be based on a paper by Rothwell et al (2020) (Resources, Conservation and Recycling 163:105065), which uses P data from 2017. This work is now outdated as a) it uses historically high animal feed P levels which have now been corrected in the DAERA database (P balance of 13.1 kg/ha used in the Rothwell paper versus the updated value of 11.1 for 2017) and b) the latest P balance data from DAERA indicate that the P balance for NI agriculture in 2023 was 8.2 kg/ha. The net effect of these two factors is that the P surplus from NI agriculture in the paper by Rothwell *et al* (2020) has been overestimated by approximately 4.9 kg/ha or 4170 t P/year. Using the current P surplus from NI agriculture of 7100 t P and assuming P

losses from non-agriculture sources remain unchanged (in reality they have increased due to additional housing and industrial activity etc), then NI agriculture currently accounts for 50.9 % of P inputs to waterways, not the 62% stated by DAERA. (Full details of calculations presented in Appendix 1.)

On the basis that the original paper by Rothwell et al (2020) is now outdated, AgriSearch request that a new analysis should be undertaken to determine the true contribution of NI agriculture to P inputs to Northern Ireland waterways.

DAERA state on page 17 that 'The water quality improvements achieved from introduction of the Nitrates Action Programme in 2007 up to 2012 have in general been offset by intensification of the agricultural sector over the last 10 years. The increased imports of concentrate feedstuff and consequent rise in the Northern Ireland agricultural phosphorus surplus have resulted in higher losses of phosphorus to waterways.'

The data provided by DAERA does not appear to support this conclusion. P balance data presented during the consultation briefings indicate that the NI agricultural P balance declined by 28.6% from 11.5 kg/ha in 2013 to 8.2 kg/ha in 2023 – a decline of 3.3 kg/ha, which equates to approximately 2845 t less phosphorus per year from agricultural sources. This reflects a decline in overall P balance from 2013 (11.5 kg/ha) to 2016 (9.0 kg/ha), an increase to 2018 (11.6 kg/ha) and a further decrease to 2023 (8.2kg/ha).

Similarly, data from DAERA on nitrogen levels (NAP Implementation Report for 2020-2023) indicates that the overall N balance of NI agriculture has remained relatively stable (115,239 t in 2004-2007 vs 117,059 t in 2020-2022), whilst overall N efficiency has improved from 20.7% in 2004-2007 to 24.7% in 2020-2022. Furthermore, DAERA data on total manure N production from all livestock in Northern Ireland demonstrate that total manure N output was similar in the period 2020/23 at 114.3 kg N/ha/year to that produced over the period 2008/11 at 114.2 kg N/ha/year,

AgriSearch recommends that DAERA reconsider the inclusion of the phrase "intensification of the agricultural sector over the last 10 years" in the consultation documents. This characterization may not accurately reflect recent developments within the sector, particularly the significant efforts made by industry stakeholders to enhance the efficiency of nitrogen and phosphorus use in livestock nutrition.

Additionally, AgriSearch notes that the term "intensification" may carry unintended political connotations and could be interpreted as attributing disproportionate responsibility to agriculture for phosphorus surpluses in Northern Ireland's waterways. A more balanced framing would support constructive dialogue and reflect the shared responsibility across sectors in addressing nutrient management challenges.

DAERA also state on Page 17 of the Consultation document that '*From 2012 to 2022 average Soluble Reactive Phosphorus (SRP) levels in our rivers increased by 55%.*' This result occurs because of the choice of the base year. For example, the data presented by DAERA demonstrate that over the most recent ten-year time period, 2014 to 2024, SRP levels in rivers stabilised (0.064 in 2014 to 0.065 mg/l in 2024) and decreased over the last 3 years from 0.073 in 2022 to 0.065 in 2024.

Of greater concern is the fact that the overall NI Agriculture P balance declined from 11.5 kg/ha in 2013 to 8.2 kg/ha in 2023 (based on revised P feed content), equivalent to approximately 2845 t less phosphorus per year from agriculture, but this is not reflected in a reduction in river SRP concentrations (0.064 mg/l in 2013 to 0.065 mg/l in 2023, this suggests that non-agricultural sources of P have increased over this period, thereby negating the reduction in P from NI agriculture.

The evidence available does not demonstrate a clear correlation between the overall NI agriculture P balance and SRP levels in rivers over the last ten years (2013 – 2023). As a consequence, there is no evidence that the proposed reduction in individual farm phosphorus limits will have any impact on future river SRP levels in the absence of an overall Northern Ireland phosphorus strategy. It is particularly concerning that the agricultural P surplus has decreased by 29.3% in the most recent five-year period (2018 – 2023) with no effect on the P content of rivers. This makes it very difficult to understand DAERA's proposal to impose P balance restrictions on farms across Northern Ireland. Teagasc catchment research findings have shown there is a substantial lag in land application of P and SRP levels.

AgriSearch also note that the research report used by DAERA on Page 18 of the consultation to suggest a link between farm phosphorus balance and soluble reactive P levels in rivers and lakes (Jordan et al, 2024 – Journal of Environmental Management 372:12347) used outdated historical NI farm P balance data which do not reflect the latest DAERA estimates of P balance over the period 2009 to 2023, which take account of reduced P levels in animal feedstuffs. This research needs to be updated to take account of the latest P balance data.

The current proposals in the consultation paper for farm level P balances with surplus of 10kg P/ha/year by 2027 reducing to 8 kg P/ha/year by 2029 pose a major threat to the agri-food sector in Northern Ireland and are totally unworkable. The Economic Impact Assessment undertaken by AgriSearch in partnership with other agri-food sector bodies indicates the potential of an annual impact of £1.56 billion from the imposition of an 8kg P/ha limit These targets are impossible for the majority of farms to meet within the timescales imposed. The targets within the draft regulations of 12kgP/ha/year and

10kgP/ha/year are only marginally better and the majority of intensive farms will also fail to meet these.

Given that the current NI surplus is 8.2kg P /ha with farms having a very wide range of P surpluses, what justification is there for all farms above 150 kg N/ ha to have a P surplus of 8kg in 2029 if the target for the NI surplus is to be 7kg P /ha by 2033.

Since the publication of NAP 2026-2029 consultation, many farmers have been looking at P balances for their individual farms and have expressed concern at the complexity of this calculation; the majority are unable to do this calculation despite the DAERA calculator being available without assistance.

P balances are neither defined or explained in the consultation document or draft regulations. While P balances are a requirement on derogated farms (approximate 430), the remaining ~25,000 farmers will not have any experience or understanding of this calculation. AgriSearch has found it difficult to explain how a P balance operates to farmers and industry partners as it is very different from the N loading calculations that farmers have been used to. A vast amount of information about the farm is required to do the P balance calculation and most farmers need assistance. There are also considerable variations between farms. As the consultation fails to explain the basic requirements of a P balance AgriSearch can only assume that this follows the same requirements as that currently required on derogated farms. The lack of detail may also mean that farmers fail to grasp the significance of this proposal when looking at the consultation document and with no attempt to do a proper impact analysis on this measure, from its engagement with farmer on the NAP calculator took AgriSearch is concerned that many farmers simply do not realise that this could impact, and is some cases severely impact, their farming business.

In 2005, when DARD and DOE first proposed introducing P balances, the consultation paper published at that time estimated that the economic cost of acquiring additional spread lands for the pig and poultry sectors to meet a P balance of 10kgP/ha/ear to be £25 million per annum. This was a totally unrealistic proposal twenty years ago and continues to be totally unrealistic.

Worryingly, DAERA were warned within their own internal review documents. The 'Review of the 2019 Nutrients Action Programme Regulations' document on page 220 states *'Setting limits that are seen as unachievable is highly likely to result in rejection and disengagement by farmers and the agricultural sector. Without a roadmap to achieve limits, the capacity in place for slurry processing and P export, and routes to compliance, limits could lead to non-compliance.'* DAERA are clearly aware about the difficulties that P balances present yet progressed with these regardless.

The consultation paper on page 16 suggests that reducing feed and chemical fertiliser 'is a relatively straightforward way to reduce the NI agricultural P surplus' however the

same principle cannot apply at farm level. Each farm is unique and it is too simplistic to suggest this as a solution as every farm which triggers the threshold will need to calculate their P balance and see where, if any P efficiencies can be made.

AgriSearch have presented an initial impact analysis[47] of the NAP Consultation proposals using data from AgriSearch's Beacon Farm Network. These farms are among the most efficient in Northern Ireland and make excellent use of grazed grass and silage so these figures should be seen as the upper end of what is achievable.

No purchased P fertiliser was included in any of the P Balance calculations. In addition, the new lower P% content of concentrates was also used in these calculations (4.7g/kg dairy concentrate, 4.3g/kg other concentrates). The analysis showed that it is almost impossible for any herd with a milk yield of above 8,000 litres per cow to achieve a P balance of 8kg/ha. Furthermore, this analysis is based on 2023 which was a relatively benign year. The poor weather of 2024 saw most farmers feed an extra ½ t of concentrate per cow to compensate for poor forage quality. This would add an extra 4-5 kg P/ha. None of the herds considered were severely impacted by TB which would increase the number of replacements needed to be kept as well as the dairy-beef calves and the herds were all calving heifers at 24 months old. The recently completed AgriSearch dairy farmer survey indicates that 55% of the cows in Northern Ireland are in herds with a yield of greater than 8,500 litres per cow. Adverse weather, TB breakdowns and other disease incidence can add considerably to a farmers P balance.

Recent analysis from the beef sector suggests they also will struggle to meet P balances of 10 and 8 kgP/ha/year. There have also been concerns raised that the imposition of these P balances could result in some beef farmers reducing the amount of concentrate feed to meet those limits which will result in longer finishing times, higher methane production and reduce eligibility for the Beef Carbon Reduction Scheme which is a key strand of the agriculture Climate Action Plan.

The alternative for some farms to meet P balances could be to source additional land for slurry spreading. For pigs and poultry this is unachievable due to the amount of land required to meet the P balances proposed and therefore not a viable option. For some dairy farmers this may be feasible but there are concerns around this as this puts pressure on the land/conacre market and could squeeze out smaller farms or those in the arable/horticulture/beef and sheep sectors who may struggle to compete with larger dairy farmers. Policy-driven land grabs are not acceptable and will result in negative environmental consequences. This potential race for land will also prevent farmers from considering farm woodland options or any other schemes that DAERA is promoting for biodiversity, Farming with Nature, or just land that is less intensive. and therefore, may hinder progress towards climate action plan and biodiversity targets.

[47] https://agrisearch.org/news/industry-news/agrisearch-gives-initial-reaction-to-nutrients-action-programme-2026-2029-consultation

AgriSearch questions the relationship between an individual farm P balance and improving water quality and would like DAERA to provide concrete evidence as to what additional improvements that this specific measure will provide to water quality over and above the current NAP requirements. DAERA should provide examples of where this policy implementation has been successful. AgriSearch believes that P balance compliance is too much of a paper exercise which is complicated and bureaucratic and will be of little benefit to water quality but has the potential to destroy the sector. AgriSearch is concerned that DAERA is threatening the industry with this specific proposal that has not been implemented elsewhere that has the potential to close parts of the industry without delivering any additional improvements to water quality.

DAERA suggest the purpose of the P balance limit is to reduce surplus P and limit the buildup of excess soil phosphorus levels. However, AgriSearch are repeatedly hearing from dairy farmers that despite calculating a high P balance they are not showing a build-up of soil P in their soil analysis results. There is a clear need for more research into this aspect which AgriSearch would be keen to progress.

In the 'Review of the 2019 Nutrients Action Programme Regulations' page 222 DAERA refers to 'there is accurate information available to calculate the farm phosphorus balance and this can be used as a guide to water quality'. This contradicts what is stated on page 118 which outlines that 'P excretion levels from different classes of livestock are not well defined, with the values for dairy cattle are based on data which is several decades old.' DAERA have provided a recommendation for a programme of sampling and analysis of slurry from commercial dairy farms to improve accuracy in the data that is used.

A research report used by DAERA on Page 18 of the consultation to suggest a link between farm phosphorus balance and soluble reactive P levels in rivers and lakes (Jordan et al, 2024 – Journal of Environmental Management 372:12347) used outdated historical NI farm P balance data which do not reflect the latest DAERA estimates of P balance over the period 2009 - 2023, which take account of reduced P levels in animal feedstuffs. This research needs to be updated to take account of the latest P balance data.

Optimal Soil P Levels for Grassland.

RB209 guidelines recommend a target index of 2, with maintenance applications of 90 kg phosphate per ha for silage and 20 kg/ha for grazing.

At Index 3, RB209 recommends 20 kg phosphate/ha for silage with no P required for grazing.

DAERA recommend Index 2+ for grassland and use the RB209 recommendations above.

It is worth noting that Ferris et al (2010) (Animal 4; 560 – 571) in a survey of 36 farm silages across Northern Ireland observed P concentrations ranging from 1.4 to 3.9 g/kg DM

RB209 Page 8 states that P deficiency is indicated when the P concentration of herbage is less than 0.35% (3.5 g/kg DM). This suggests that a considerable proportion of forage is P deficient.

On this basis, AgriSearch recommends that the proposal on use of chemical P should be based on forage P analysis, with provision for its use when forage P deficiency has been identified.

Use of N Production Threshold

While AgriSearch recognises that DAERA have tried to target intensive farms, using a N production threshold of 150kgN/ha/year which includes imports. N production is not defined in the regulations which is another key omission. This 150kgN/ha level is too low and puts smaller farmers off importing organic manures in case they trigger this threshold and are required to carry out a P balance. As outlined above AgriSearch questions if the 150kgN/ha/year N production limit is an appropriate level to trigger a requirement to meet a P balance. As mentioned previously some very small farms with small slurry volumes could trigger the 150kgN/ha if they are 'intensive' on a small area while some very large farms could fall below the 150kgN/ha. This also requires another calculation to be carried by farmers and is more likely to vary annually depending on the type of stock and age on farm than using the previous method of livestock units. AgriSearch believes that the 3100 + "intensive" farms estimate is inaccurate, and many more farms could be caught by this proposal.

In addition, the effect that TB has on cattle farms will leave farms completely unable to manage. TB breakdown on farms can come from a number of sources, including wildlife. In the event of TB breakdown on dairy or beef farms stock levels will inevitably rise due to movement restriction placed on herds. This again leaves farmers with nowhere to turn to manage the nutrient balances on their farms.

If this measure was imposed, there is not the capacity within DAERA/ CAFRE to provide adequate support and assistance to farmers carrying out P balances as this would represent around a tenfold increase in the number of farms required to produce a P balance each year. AgriSearch has held discussions with the Agricultural Consultants Association who have expressed genuine concerns about the capacity on consultants to produce the required P balances in a timely and effective manner.

There is also anecdotal evidence from farms which have a P balance above the proposed limits but are not indicating a build-up of phosphorus in their soils. There

needs to be more research on offtake, phosphorus exported in milk, multi-cut high yield silage systems to better understand how phosphorus is cycling within farms.

There are off-land solutions potentially available to reduce P surpluses on farms, and the pig and layer industries have indicated their willingness to continue to progress such solutions however time is needed. There are also considerable barriers linked to planning with ammonia (operational protocol) interpretations and the impact on designated sites of concern. DAERA must consider that if they want to support a viable agri-food sector and assist them in becoming more sustainable then they must remove the barriers put up by Government which are preventing environmental improvements. If DAERA are genuine about improving water quality, reducing phosphorus on farms and supporting off-land solutions for organic manures then there must be a complete overhaul of the planning regime, including the ammonia operational protocol. and a positive attitude to alternative solutions rather than the risk averse positions that are currently taken.

AgriSearch are supportive of both the Soil Nutrient Health Scheme (SNHS) and the Sustainable Use of Livestock Slurry (SULS) initiative which both aim to reduce P surpluses on farms and ultimately improve water quality.

The SNHS aims to provide soil analysis to all NI farmers, support and nutrient management training to allow more farmers to improve their nutrient use and efficiencies on farms and therefore providing an environmental benefit. The pilot scheme which ran before SNHS had clear evidence of farmers making positive changes to nutrient management following the provision of soil test results and advice. It is therefore expected that the same will happen with SNHS. As outlined above, the scheme is still progressing with the last zone, zone 4, only recently open for applications for soil testing. The majority of farmers have still to go through training. It is surprising that DAERA have decided to ignore the progress of the SNHS and impose radical and extreme P balances despite the ongoing knowledge transfer approach through the SNHS.

The SULS initiative has only started with the third contract still to be awarded. This pilot project is trialling the separation of slurry and removal of some phosphorus off-farm. This also has potential to improve the P situation on some farms, but it is still at the early stages and needs to be given the opportunity to finish and report and see if these projects are viable, practical and scalable. These projects face considerable barriers in both policies on renewable energy subsidies and the ammonia operational protocol. If these projects are to be successful, government will need to deal with the barriers they face in a manner that allows widespread adoption of the methodologies that are successful. We are aware, as a result of research conducted by a Masters student at Queens this summer, that the likely maximum tonnage of manures and dung that could be used in NI AD plants would be less than a few 100,000 tonnes. This would not be

enough for any of the agricultural industries on the numbers proposed without widespread change in the scale of this potential partial solution.

The UK Dairy Demonstrator project also is investigating diets in dairy cows and phosphorus is a key research component.

It makes no sense that DAERA & Defra are funding all of these programmes yet decide to impose the P balance measures knowing the impact and that alternatives to land take or reducing numbers are not viable yet on most farms.

Arable land will also be part of the solution and more needs to be done to incentivise and make things easier for arable farmers to take organic manures from other sectors. Arable farmers have been excluded from grants for slurry storage in the past and from applying for equipment such as LESSE yet supporting these sectors to allow for better infrastructure and equipment could result in them taking more organic manures if the bureaucracy surrounding organic manure imports was minimised.

While P balances rolled out to more farms are currently unworkable and will not be accepted by the agri-food sector, the other option suggested to limit the spreading of organic manures will also not allow the industry to operate. DAERA refer to the need to work with industry stakeholders to 'develop and publish a 'Roadmap for Phosphorus efficiency on farms. This is a sensible approach and should have been established some time ago and it would have been made very clear that the current measures on the table are just not feasible and will not be accepted.

Challenge to the link between farm P balance and P levels in rivers

In the presentation at the Greenmount Information event on 29 May, 2025, uploaded to the DAERA website on 27 June, 2025, Slide 17 of the presentation 'Proposed Nutrients Action Programme 2026-2029' states that there has been a '38% increase in phosphorus in NI rivers since 2012' and that 'the agricultural phosphorus surplus needs to be reduced significantly to improve water quality.' However, DAERA'S own data, presented in Slide 15 of the same presentation, demonstrate that over the 5-year period 2018 to 2023, the overall agricultural P surplus declined by 29.3% from 11.6 to 8.2 kg/ha, yet SRP levels in rivers increased from 0.063 mg/l in 2018 to 0.073 mg/l in 2021, before decreasing to 0.065 mg/l in 2023.

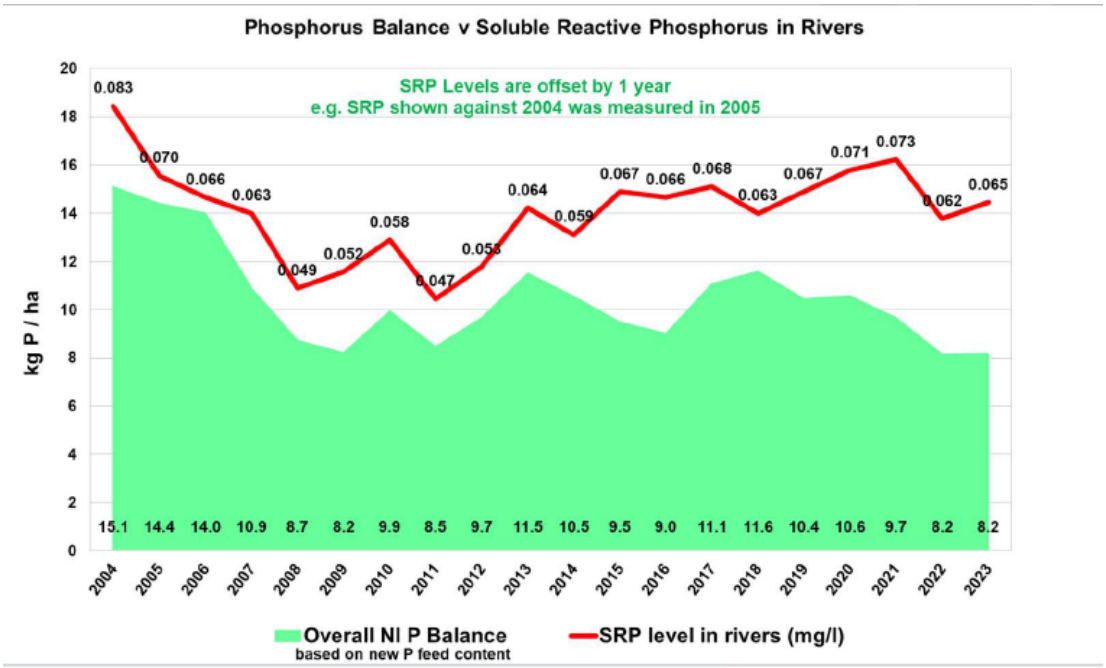

Figure 4 Phosphorus Balance v soluble reactive Phosphorus in Rivers

The evidence presented above demonstrates that, from 2014 onwards, there is no clear link between the agricultural P surplus and the soluble reactive phosphorus content of rivers in Northern Ireland. The fact that the agricultural P surplus has declined by 29.3% in the most recent five-year period (2018 – 2023) with no effect on P content of rivers, suggests that non-agricultural P sources are increasing and offsetting the progress made by the agricultural sector.

Review of Standard Values for calculation of Nitrogen and Phosphorus

Dairy Cow N excretion rates

SVNP 1 – *From 1st January 2026 the Department proposes to update the dairy cow nitrogen (N) excretion rates based on most recent AFBI data to ensure consistency with data used for the ammonia inventory. Proposal that rates are banded based on annual milk yield. This would ensure more accurate accounting of nutrients produced by various dairy production systems, particularly high input herds.*

The revised dairy cow nitrogen excretion figures will result in additional costs to many dairy farmers as they struggle to meet the 170 kg N/ha/year limit. These farmers will be forced to reduce stock numbers, find additional land, export more slurry or apply for a derogation (if they can meet the conditions). All these options, apart from the derogation, will result in additional costs to the farm at a time when there is uncertainty in the industry. It does highlight the importance of the derogation for Northern Ireland

as more farms in NI will need this option if these revised N excretion rates are introduced.

Adopting a banded system will result in more paperwork for farmers. This adds to the bureaucratic burden of these regulations, introduces another level of complexity and therefore increases the potential for non-compliance and penalties. DAERA and NIEA are unable to request milk yield data as this is commercially sensitive information.

This new multi band approach to dairy cow nitrogen excretion figures will put NI farmers at a commercial disadvantage to our close EU neighbours in ROI where currently there are only 3 bands 80, 92,106 kg N/ha.

AgriSearch would also query how this measure would work in practice. There is mention of a three-year rolling average but no explanation on how this would work, the information that would be required, how it is inspected or checked and no information in the draft regulations.

Farms with lower milk output have always had the option of using a lower figure as this is permitted within the existing NAP regulations (regulation 9 (5)). NIEA has been asked in the past to outline the information they need to allow farmers to take up this option but have never produced the required guidance which is generally why farmers did not deviate from the standard figure.

AgriSearch would also highlight ongoing research funded by DAERA and industry outlined in the 'Review of the 2019 Nutrient Action Programme Regulations' booklet which is considering 'Reducing nitrogen excretion from dairy cows from dietary manipulation.' This research is focusing on the effect of reducing crude protein in diets which is also a key focus within the draft DAERA Ammonia Strategy. It seems premature to move forward with revised dairy nitrogen excretion figures before this latest work on diets comes to a conclusion and may further impact N excretion.

Dairy Cow P excretion rates

SVNP 2 – *From 1st January 2026 the Department proposes to update the dairy cow phosphorus (P) excretion rates, banded based on annual milk yield*.

The concerns outlined above in terms of bureaucracy, complexity, practicalities around data protection with regards to milk yields also apply to this proposal. AgriSearch questions the purpose of introducing P excretion bands for dairy cows as they don't appear to be used to calculate farm P balances? The P excretion levels given in the NAP proposal appear to be excessive at the higher production levels.

The 'Review of the 2019 Nutrients Action Programme Regulations' booklet page 118 outlines that 'P excretion levels from different classes of livestock are not well defined,

with the values for dairy cattle based on data which is several decades old.' There is a recommendation for a programme of sampling and analysis of slurry from commercial dairy farms and the UFU would urge DAERA and AFBI to progress this to improve accuracy in the data that is used and to give confidence to the industry around the figures.

Updated standard values for separated manures and slurries

SVNP 4 – *From 1st January 2026 the Department proposes to update the standard values for separated manures and slurries*

AgriSearch support the updating of the standard values as new research comes to light and new technologies are adopted. These need to be reviewed at regular intervals. Farmers should always have the option of using actual values obtained through an accredited laboratory.

Nitrogen Fertiliser

Prohibiting the use of granular urea fertilisers unless they contain urease inhibitors

NF1 - *From 1 January 2026 to prohibit the use of granular urea fertilisers unless they contain urease inhibitors*.

AgriSearch has serious reservations about a blanket ban on urea fertiliser that does not contain urease fertilisers.

This proposal has arisen from the draft Ammonia Strategy and is included in NAP on that basis however this is not explained in the NAP consultation document. Urea use in Northern Ireland is low therefore the imposition of this proposal will have very limited benefits in terms of ammonia reduction.

Industry representatives in GB have questioned the impact of inhibited urea on soil health and quality. In response DEFRA has concluded 'The impact of increased use of UIs on soil quality is uncertain due to a lack of evidence. There is some evidence that UI-treated urea, as it retains integrity longer in the soil for plant uptake, can lead to increased concentrations of ureic nitrogen in connected watercourses.' DEFRA also indicates that they will investigate this in more detail before adopting a regulatory approach. DAERA must consider this point before imposing a policy that could result in further unintended consequences.

The ammonia losses from urea are dependent on spreading conditions. The assumptions behind the emission factor for urea fertiliser does not consider the

mitigation efforts put in place by farmers to protect urea such as spreading conditions, timing of spreading etc. The majority of urea is spread in the early part of the year when conditions are most suitable and losses will be minimal. Farmers management is key and as fertiliser is expensive, farmers will ensure that they spread in conditions that minimize N losses from urea applications.

There are concerns about the research used to verify ammonia reductions from inhibited urea. The consultation reports that Urea + NBPT resulted a reduction in ammonia losses of 78.5% compared with straight urea however this may be a considerable overestimate due to the measurement system used in the research (wind tunnels) which limits vital rainfall and encourages N-loss from Urea. Forrestal et al (2016)5 have highlighted that "farmers can maximise suppression of NH3 loss from urea by applying shortly before the onset of appreciable and sustained precipitation". The majority of farmers who use urea will follow this advice to minimise losses therefore the Ammonia Strategy will be overestimating the contribution of emissions from urea.

Forrestal et al (2016) also clearly highlight gaps in the knowledge that need to be addressed outlining that "This study has provided information on the abatement potential of a suite of N fertiliser options, however there is an important knowledge gap regarding absolute levels of NH3-N loss from urea in Irish grassland which could be addressed by a campaign of micrometeorological measurements. Such knowledge is of critical importance in the context of national commitments to reduce NH3-N loss whilst growing the agri-food sector."[48]

Urea inhibitors have a reported shelf life of 6-12 months with many suppliers advising use within 3-4 months. 'Use by' dates should be required on fertiliser with urea inhibitors. This area has not been recognised within the consultation.

Urea is also used in orchards and it is important to ensure that there is a suitable cost-effective alternative for the horticulture sector if this ban is to be imposed.

If this measure is to be imposed, DAERA should note that some fertiliser companies have already highlighted that they will be unable to supply this product within the stipulated timelines of 1 January 2026 due to the lack of appropriate infrastructure being in place in Northern Ireland. Had DAERA engaged appropriately with Stakeholders in advance of the consultation launch this aspect could have been clarified.

Despite proposals to ban urea, England have not adopted a blanket ban due to various concerns raised by stakeholders. All the above points suggest that it would be unwise

[48] Forrestal, P. et al, (2016), Ammonia emissions from urea, stabilized urea and calcium ammonium nitrate: insights into loss abatement in temperate grassland. Soil Use Manage, 32: 92–100

to consider banning the use of urea fertiliser in NI when there are still so many uncertainties around the costs and benefits of this policy proposal.

Many crop farmers have adopted the process of melting urea and applying it as a foliar feed in a little and often approach. This reduces the impact on soil biology and the possibility of leaching from soils. While DAERA have outlined that there is no intention to require liquid fertiliser to be inhibited, they have not confirmed if they will permit the use of straight urea for melting on farms to be used as a liquid fertiliser. This practice would not be possible with inhibited urea and therefore another example of how DAERA policy can have a negative impact on both the environment and farmers.

Given the comments above AgriSearch would call for more research on the long-term effect of the use of protected urea to be conducted within Northern Ireland.

Review of Chemical Nitrogen Fertiliser Limits

NF2 - *The Department has reviewed the current Chemical Nitrogen fertiliser limits for grassland and proposes to include the updated figures in the Schedule within the Regulations*.

AgriSearch consider that this proposal if implemented will undermine one of the key competitive advantages of ruminant livestock production in Northern Ireland – the ability to produce high yields of quality grass. In any case, we consider that the scientific justification that is provided is flawed. Data presented by DAERA in the consultation document highlights that animal feed P is the main source of surplus P in Northern Ireland. It therefore seems perverse that DAERA propose to restrict grass growth, by restricting chemical N fertiliser application, thereby increasing the requirement for imported animal feed, further increasing the P surplus for NI.

Data from the NI Environmental Statistics Report (2025) indicate the very low levels of nitrate in rivers and groundwater in Northern Ireland based on sample sites in 2024, with 90.6% of rivers with nitrate levels below 10 mg/l and 94% groundwater sites with nitrate levels below 25 mg/l. In addition, the Sustainable Agricultural Land Management Strategy recommended increasing silage yields and silage quality as a method for ‘mining’ P from soils and displacing P from concentrate feeds. Increasing the yield of grass grown removes more phosphorus from the soil (Khomenko et al 2023 Soil Science 13:100110) thereby reducing potential for P loss to waterways. Increasing silage yields and quality was also shown to lower P balances on farms. However, to achieve these higher silage yields, appropriate levels of chemical N are needed which is contrary to what is being proposed in the NAP 2026-2029 consultation.

AgriSearch considers that the evidence supporting DAERA's proposal to reduce chemical fertilizer N limits presented by DAERA on the NAP Consultation website on 20 June 2025 entitled 'AFBI Scientific Evidence Contributing to N Fertiliser Limits' is seriously flawed

In brief the appraisal notes that none of the trials referred to in the AFBI paper were designed to investigate grass yield responses to chemical N fertiliser under non limiting conditions. Several of the studies are confounded by constraints on herbage production, including low pH soils, incomplete assessment of growth over the full growing season, delayed application of fertiliser in spring and early cessation of fertiliser application in mid-summer. Of particular concern is the inclusion of unpublished data from several studies, including a recent trial, which appears to be the main basis for the proposed reduction in chemical N levels.

Furthermore, the AFBI paper omits to include the seminal papers on grassland response to N (the Grassland Manure or GM studies) published in the early 1980's which provide a robust scientific evidence base for current chemical N fertiliser recommendations. AFBI have also chosen not to include data from a more recent published study undertaken at Hillsborough (Forrestal et al, 2017), which demonstrates a much higher response to N fertiliser than the unpublished studies included in the report.

In their calculations of the fertiliser limits for slurry AFBI have assumed that 40% of N in slurry is always available to the plant whereas in reality this level of N availability is usually only seen during spring applications and would generally not be applicable from second cut onwards.

There has been a lot of public debate around the proposal to impose new limits for chemical nitrogen. When the first NAP was proposed in 2004/5 there was considerable time spent discussing revised chemical nitrogen limits for Northern Ireland with a specific stakeholder scientific group established to work on this issue. Months of discussion resulted in an agreed set of figures that the industry could be confident in and that could be accepted by the European Commission as part of the NAP process.

It was agreed at that time to work with two limits for chemical N fertiliser on grassland for dairy cattle and other livestock. This results in a simple system which all farmers could understand and was practical to implement and enforce with minimal burden in terms of record keeping.

In the 'Review of the 2019 Nutrient Action Programme Regulations' document, Table 31 shows the chemical fertiliser N usage which demonstrates a significant reduction of 24% between 2004-2006 period to 2021-2023. From 102.1 kg N/ha/year to 77.9kgN/ha/year. The same report also notes that 'compliance with nitrogen fertiliser

crop requirements was also very high'. Farmers have reduced chemical N usage and improve N efficiency in this time.

Upon publication of the 2026–2029 Nitrates Action Programme (NAP) consultation, AgriSearch noted with concern the inclusion of revised figures for chemical nitrogen (N) application, particularly as there had been no prior engagement or indication that such changes were under consideration. Across three stakeholder meetings held in May 2024, November 2024, and May 2025, no reference was made by AFBI to new scientific evidence that would support revisions to chemical N limits.

Tables 7 and 8 of the consultation document introduce revised nitrogen fertiliser limits for grass silage and grazing. However, these figures are not reflected in the accompanying draft regulations, creating a lack of consistency within the consultation materials.

AgriSearch representatives attended a DAERA-themed workshop on nitrogen on 2 June 2025, where additional scientific data was presented to support the proposed changes. It is the view of AgriSearch that this information should have been included in the consultation document itself to ensure transparency and allow all stakeholders the opportunity to fully assess and respond to the proposals.

Furthermore, it is noted that the scientific evidence underpinning Table 7 is derived from a study that had only recently concluded. According to AFBI, the data from this study is still being processed and has not yet undergone peer review or been published. This study is also not referenced in the consultation document. A supporting document titled *AFBI Scientific Evidence Contributing to N Fertiliser Limits NAP 2026–2029* was subsequently published by DAERA on 20 June 2025—midway through the consultation period. AgriSearch considers it inappropriate for key supporting evidence to be made available only partway through the consultation process.

As previously stated in this response, AgriSearch continues to question both the scientific basis and the policy proposals outlined in Table 7.

Many of the farms with which AgriSearch works have outlined that the levels of chemical N proposed would not be sufficient on many grass-based dairy farms to grow sufficient yields of grass to support their farm. AgriSearch have repeatedly heard from farmers who have outlined that this restriction would require them to increase concentrate feed on their farm which would result in them increasing P and for some who were able to meet P balances will then exceed the proposed P balance figures. There is also potential for considerable additional costs if DAERA force farmers in this direction.

It has also become apparent that there is not enough research work being carried out on silage quality and yields in recent years. There is a trend on farms moving towards a 4 or

5+ cut silage systems and more research work is needed to understand the crop requirements of these systems. In addition, there needs to be more understanding about the ability to 'mine' phosphorus from soils.

Northern Ireland does not have a nitrogen problem therefore it remains unclear as to why DAERA are proposing to significantly reduce chemical N requirements which would force an increase in P inputs which is outlined as the major environmental issue in terms of water quality.

The Sustainable Agricultural Land Management Strategy recommendation increasing silage yields and silage quality as a method for 'mining' P from soils and displacing P from concentrate feeds. This was also shown to lower P balances on farms but to achieve these higher silage yields, appropriate levels of chemical N are needed which is contrary to what is being proposed in the NAP 2026-2029 consultation.

The reductions proposed in chemical N fertiliser will significantly reduce herbage production for silage on ruminant livestock farms in Northern Ireland. For example, currently 'other livestock' farms can apply up to 222 kg chemical N/ha under the 2019 NAP, with dairy farms applying up to 272 kg N/ha. Under the new proposals the maximum chemical N fertiliser limits for dairy and intensive beef farms is 150 kg N/ha for derogated farms and 182 kg N/ha for non-derogated farms, with limits of 210 and 242 kg N/ha for derogated and non-derogated 'intensive high yielding' farms respectively.

It is interesting to note that the estimated reduction in grass yield calculated above is in line with a DAERA Advisory note issued on the DAERA website on 1 April 2022 entitled 'Fertiliser for first cut silage'.

'For example, in a recent scenario generated for a 100 dairy herd plus followers at a stocking rate of 2.0 CE/ ha, it was estimated that reducing applications of CAN by 20 kg N/ ha per cut over a 3 cut silage system, could reduce the amount of fertiliser applied by 7.4 t leading to a saving of around £6,500. However, the reduction in yield may result in a reduction of around 200 t silage (60 t DM) to the resulting fodder stocks on the farm than in previous years. Replacing this with purchased silage at £40/ t could result in a cost of £8,000. Alternatively replacing the deficit with concentrate at £400/ t could cost around £27,000.'

The potential implications of the proposed reductions in chemical N fertiliser are presented in Appendix 3 of the scientific critique. In summary, the proposed lower limits will result in a reduction in silage production of 83,700 t DM, and assuming that half of those affected decide to feed more concentrates to replace this, will require 47,550 t additional concentrate (as fed basis). Based on an average P content of 4.7 g/kg fresh weight, this will increase the overall NI agricultural P surplus by 221.6 t

The net impact of this proposal will be either a) a reduction in livestock numbers or b) an increased use of supplementary feeds containing additional P. A further perverse outcome of the new proposals is that derogated farms, operating at significantly higher stocking rates, with an increased grass requirement, will be required to use lower chemical N fertiliser rates than non-derogated farms operating at lower stocking rates.

Drought conditions: Page 31 of the consultation paper states 'During drought conditions, there should be no application of nitrogen fertiliser'. While there is some background text on drought conditions and potential risk of losses explained, it is unclear as to whether or not DAERA is including this as a new measure within NAP. It is not presented in the draft regulations. AgriSearch would have considerable concerns around this, particularly as 'drought conditions' have not been defined. It is good farming practice not to apply fertiliser in drought conditions and the majority of farmers will know this. Further education and guidance should be pursued as the route to increase awareness on this rather than regulation and enforcement.

N Fertiliser Limits for Grazed Fields.

The consultation paper outlined that table 8 is based on RB209 for grazed fields however data is missing from the table 8 presented compared to that found in RB209. There is no explanatory text around Table 8 describing how this is to be used, and it is not included in the draft regulations therefore it is impossible to comment on this aspect. It is unclear as to whether this table is setting out new limits or revised figures or how it works in conjunction with Table 7. AFBI have also clarified that they are unable to provide any justification for the figures provided in Table 8 and there has been no work carried out in Northern Ireland on this area.

AgriSearch cannot provide comment on Table 8 due to no explanation being provided on why it is included in the consultation paper. The addendum paper published in late June appears to reference this issue, but its late publication did not allow time for this to be properly considered; a major flaw in the consultation process.

If different limits are to be imposed for grazing land and silage ground, then it is unclear how this could be inspected and enforced. Currently NIEA use information from the DAERA Single Application Form to determine grassland areas however, this form does not differentiate between silage and grazing areas. Should DAERA impose different limits on grazing and silage fields then even more paperwork and inspection would be required which is unacceptable.

Introduction of an allowance / limit for fertilisers derived from processed livestock manures

NF3 - The Department proposes to introduce an allowance/limit for fertilisers derived from processed livestock manures.

In principle, AgriSearch supports the proposal to introduce an allowance for processed livestock manures as this will facilitate processing of manure/slurry in Northern Ireland. However, insufficient detail is provided in the consultation document or within the draft regulations in terms of the definition of 'processed organic fertilisers' or 'processed livestock manures' or the justification for a proposed limit of 100kgN/ha from processed organic fertilisers. Thus, making it difficult for this to be fully considered. On further discussion at the DAERA Themed Workshop on Nitrogen Fertilisers held on 2 June 2025, there was a suggestion that this was a product that went beyond separated digestate from an anaerobic digestion plant.

AgriSearch would support the need to mitigate the risk of contaminants or heavy metals, but clearer definitions and explanation should have been provided within the consultation document to all full consideration.

DAERA are suggesting that there would be a limit of 100kgN/ha from processed organic fertilisers. Without proper definitions it is difficult to understand the impact of that threshold. AgriSearch would also question why the 100kgN/ha/year limit has been selected as appropriate and is this the most appropriate level for NI. More investigation is needed but it is possible that all chemical N requirement should be encouraged from processed manures potentially allowing reduce costs to farms and lower greenhouse gas emissions from substituting chemical fertiliser usage.

Further information is required to allow proper scrutiny of this proposal, but AgriSearch in principle would support the inclusion of this measure. However, again the possibility of this being realised at scale will be hampered significantly due to the ammonia operational protocol preventing development or replacement buildings on farms - again this is demonstrating inconsistencies between policies on nitrogen and phosphorus.

Introduction of a mandatory liming programme

NF4 - *The Department proposes to introduce mandatory liming programmes for grassland farms with manure nitrogen production of 150 kg N per hectare per year or more*.

AgriSearch considers that application of lime on a regular basis is good agricultural practice, and it is right that this is encouraged as the financial gains on farm can be considerable in addition to the benefits to soil health etc from an appropriate liming

programme. However, there is a lack of detail within the consultation, and no discussion has taken place with stakeholders re the practicalities of introducing such a scheme. Furthermore, we have concerns regarding the need for a mandatory approach to liming and would prefer to see an increased emphasis from DAERA and NIEA on education and promotion of the benefits of liming as a key opportunity to increase grassland productivity at low cost. DAERA and NIEA would produce more effective results if this was incentivised and promoted rather than enforced. Farmers are receiving lime recommendations through the SNHS and training for that scheme highlights the benefits of liming and this should be the key focus from the Department.

AgriSearch also wishes to highlight the need for additional research to define optimal soil pH for different sward types, for example perennial ryegrass (prg) swards, prg/white clover swards, red clover swards and mixed species swards.

Liming is necessary but is complex, education is needed for many farmers around the type of lime etc that should be used on farms.

As this proposal only applies to 'intensive farms' over 150kgN/ha/year there will be farm businesses some years that trigger that threshold and be required to lime and in other years not be required. Questions remain as to how this then works in practice with the 25% lime requirement in year one and the remaining land over the next 3 years when those parcels of land are potentially changing and meeting the 150kgN/ha requirement is also uncertain for some farms.

The draft regulations also are inconsistent with the consultation proposals in that regulations 30 (2) requires calculations to be carried out and a lime application programme for the holding but does not mandate the actual sowing of lime to farmland, resulting in additional bureaucracy for the farmer. The consultation suggests a valid soil analysis is necessary for the area being farmed but this is not specified in the draft regulations again another inconsistency resulting in uncertainty around the consultation proposals.

DAERA also need to clarify an addition to the draft regulations around liming at 13 1(f) which states in relation to the use of chemical P 'where the soil pH is 6 or more or a verified liming plan is in place' however this is not referred to or explained anywhere in the consultation documents.

There is also ongoing debate around the most appropriate pH for soils in Northern Ireland.

As outlined previously, DAERA have made a commitment not to use SNHS for the purposes of regulation therefore these results cannot be used to enforce this aspect around liming.

It also should be noted that this proposal will be complex for conacre land. Many farmers are reluctant to invest in liming conacre land which they have no certainty of farming in the following year. The Sustainable Agricultural Land Management Strategy for NI[49] clearly identified the limitations on conacre land which makes up around 30% of land in NI. It highlights that 'tenants will generally be reluctant to invest in soil fertility or environmental performance because they have no guarantee of a return on their investment'. The UFU would highlight that mandating liming on four-year cycles will extremely complex to operate and enforce on conacre land.

There are also concerns around limitations in terms of liming if ground conditions and weather or farm economics do not support liming in a particular year and how this would be treated by inspectors.

DAERA refer to the no lime applications on peat soils, but this specification is not included in the draft regulations. There is also no definition of 'peat soils' within the draft regulations or any method outlined in how a farmer or inspector would determine peat soils on farms. AFBI Peatlands programme estimated 31,000 ha of improved grassland over peat and therefore would suggest this land is not suitable for mandatory liming for environmental reasons, yet DAERA have provided no policy direction around this within the NAP.

DEROGATION

AgriSearch welcomes the commitment to renew the derogation. As recognised by DAERA this is important to some cattle farmers in NI with higher stocking rates.

The 'Review of the 2019 Nutrient Action Programme Regulation' (page 87) discussed the requirement for derogated farms to have greater than 80% grass. This was a requirement imposed by the EC and therefore there is now more flexibility around this. The paper discussed the potential for permitting more crop to be grown on arable land that could lower the requirement for concentrate feed and what it also didn't mention was the potential to 'mine P' from soils through crop offtake. There is a considerable amount of whole crop silage and maize grown on dairy farms in Northern Ireland and many of these farms could be currently excluded from the derogation due to the 80% requirement. AgriSearch is disappointed that despite some recognition that there could be more flexibility on this that could help attract more farmers into the derogation (something which DAERA have consistently expressed the desire to do) the Department have not explored this within the consultation document.

[49] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/16.17.079%20Sustainable%20Land%20Management%20Strategy%20final%20amended.PDF page 22

Derogated farms are largely not permitted to grow nitrogen fixing plants for example clovers, peas, beans and lucerne. This appears to be contradictory to DAERA policy and should be revisited and removed from derogation conditions in the 2026-2029 NAP. In other parts of DAERA, incentives are in place to encourage home grown protein crops to displace some imported feed. Leguminous crops (which fixate N) result in a reduced requirement for chemical nitrogen fertiliser, reducing inputs and potentially reducing ammonia and greenhouse gas emissions on farms. AFBI (with AgriSearch co-funding) have carried out a research project 'the role of higher protein forages and home-grown protein sources within NI dairy systems' which highlights these could lower the NI phosphorus balance and if grown on the farm in which they could be used could lower the P surplus on farm. It is therefore unhelpful that those farmers who are derogated and are willing to grow more protein crops are prevented from doing so and are unable to avail of the DAERA Protein Crop Scheme.

Technical Amendments

TA 1 - *Definition – "Dirty Water" 'mater' change to 'matter'*

TA2 - *Regulation 21(4)(e) – 'katsitified' change to 'karsified'*

TA 3 - *Regulation 27(1)(n) – 'time' change to 'type'*

TA 4 - *Regulation 32(10) – 'period' change to 'person'*

TA 5 - *Schedule 2, table 2 – title insert regulation 14*

TA 6 - *Schedule 3, table 3 – Goat manure – dry content change '25' to '40'; Horse Manure – dry content change '30' to '25'*

TA 7 - *Schedule , paragraph 12, after 'Any slurry storage tank' insert 'except lagoons'*

TA 8 - *Definition – "Appropriate Person" (c) Amend 'Livestock Manure' to 'Organic Manure'*

TA 9 - *Definition – farmyard manure to include stackable organic manures*

TA 10 - *Schedule 5, paragraph 4 – 'sampling every 4th year shall be satisfactory…' amend to 'sampling every 4th year must…'*

TA 11 - *Regulation 27(1)(f) – Authorisation changed to notification*

The Department will be amending the following terms within the 2025 Regulations to align with terminology used across the Department and industry:

'Fertilisation Account' will be amended to 'Nutrient Management Account' and 'Fertilisation Plan' will be amended to 'Nutrient Management Plan'.

While AgriSearch accept the need for the proposed technical amendments outlined in the consultation, it should be noted that many of the references to the regulation numbers etc are incorrect.

AgriSearch welcome the inclusion to update the regulations to clarify that the covering of new lagoons is not required as was agreed during the NAP 2019-2022 consultation and is outlined in the Guidance Booklets.

Page 43 under point 8. of the consultation document refers to 'It is also proposed that as part of the controls on NAP that there is a requirement to notify the Department of movement all organic manures on and off a farm. This amendment will extend the definition of an appropriate person to beyond those who have custody or control of livestock manures. AgriSearch would like further clarification as to what this means and the implications that it would have as it is vague and difficult to comment on.

Information system for slurry spreading conditions

IS 1 - *The Department proposes to introduce a simple information system to provide a warning when widespread heavy rainfall is forecast, and conditions are unsuitable for slurry spreading. (Action 9 of the Lough Neagh Action Plan.) It is proposed that from February 2026, that failure to comply with early warning notifications will be a breach under the NAP Regulations.*

The current regulations prevent farmers from spreading slurry in inappropriate conditions and when heavy rain is forecast therefore it is unclear what additional benefit this measure would bring to farmers or the environment.

The vast majority of farmers operate within the current rules and spread when regulations permit. If there are those who fail to comply then they should be dealt through the appropriate mechanism and focus NIEA resources on persistent offenders rather than on a system which tells farmers what they already know.

It should also be noted that despite every effort to comply with regulations, the inaccuracies that surround weather forecasting will always catch some farmers out particularly in showery weather conditions.

Farming activities are driven by the weather therefore farmers are constantly observing weather and ground conditions in their area and will have various methods for doing so. It is unnecessary to bring in a 'weather warning system' to tell farmers what they already know.

Notifying farmers by text, email and website ignores the concerns around accessibility, broadband, phone network and IT skills. There will also be a cost to establishing this system, but these have not yet been quantified therefore stakeholders are unable to assess the cost / benefit of this measure. Resource for this would be better directed towards education and knowledge transfer and to target the persistent offenders.

It should also be noted that the continued imposition of rules on farmers forcing the use of contractors such as around LESSE removes the flexibility that farmers have to spread slurry at the most appropriate times.

The 'Review of the 2019 Nutrient Action Programme Regulations' document page 210, *outlines 'it appears therefore that there is limited potential to use the issues of a yellow warning to provide additional buffering in terms of warning time in advance of heavy rainfall.'* This is because the majority of weather warnings are issued less than 48 hours before they are put in place. The current regulations require slurry spreading to not take place within 48 hours when heavy rain is forecast. Weather warnings can also be cancelled at shorter notice, would this result in DAERA removing their advice?

The analysis carried out and referred to Review of the 2019 Nutrient Action Programme Regulations' states *that 'it is strongly recommended that consultation with Met Office and Met Eireann is undertaken'* due to limitations with the assessment of this proposal and outlines that this has not happened within the timeframes. It is therefore unacceptable that DAERA have proposed to include this measure without following their own internal advice to explore this further.

Weather across Northern Ireland will vary significantly in any day therefore it is unrealistic to assume that this measure will be of any benefit to farmers or the environment. Limiting slurry spreading when conditions are favourable may result in less frequent but heavier application of slurries at other times therefore increasing run off potential.

This measure will also result in confusion. If DAERA chose to only notify farmers when a weather warning is issued across NI, farmers in areas where a regional weather warning is in place may believe because no communication from DAERA has been received that it is permitted to spread in that region on that day when that would actually be a breach of the current rules.

The draft regulations do not align with the commentary in the consultation paper. Firstly, they apply to all fertiliser whereas the consultation paper just specifies a slurry spreading warning system. Secondly the regulations also do not specify yellow weather warning or above as has been outlined elsewhere which AgriSearch believes that the measure could be used to significantly reduce the time for slurry spreading for a multitude of reasons due to the lack of definition at regulation 8 (2) (e)

The NI Beef and Lamb Farm Quality Assurance Scheme (FQAS) requires farmers to make a declaration indicating that they only spread slurry in appropriate conditions and comply with the NAP regulations on this. This is another aspect of awareness raising.

AgriSearch believes this measure is an unhelpful and unnecessary addition to the NAP.

Anaerobic Digestate Measures

AD 1 - *From 2027 all digestate should be separated to reduce phosphorus content before it can be land spread. Where liquid digestate has a P:N ratio of 1:10 or lower, it can be land spread, in line with regulations covering cattle slurry.*

While in principle it is positive to promote nutrient recovery technology and this is to be encouraged, the ammonia planning operational protocol is currently so restrictive that it will not permit new or replacement separation equipment to be installed in the majority of plants across NI. This is an example of a lack of joined up policy development within DAERA and NIEA. For this reason, the AgriSearch cannot support the requirement to separate as the majority of AD plants/farms will be unable to meet this. The implementation of the ammonia operational protocol by NIEA is stifling the industry's ability to meet water quality, air and biodiversity targets.

AD 2 - *Where digestate is not separated, or it has a P:N ratio of greater than 1:10, it must be applied to crop requirement for phosphorus and nitrogen according to a Nutrient Management Plan.*

AD 3 - *If digestate is produced using feedstocks from outside Northern Ireland, it must be applied to crop requirement for phosphorus and nitrogen according to a Nutrient Management Plan, regardless of digestate separation or processing technology.*

AgriSearch can support both these proposals provided that the digestate should be produced from feedstocks that are at least 60% (by weight) classed as waste under Waste Framework Directive and provided those feedstocks are solely sourced from Northern Ireland

AD 4 - AD *plants will be required to record movements of separated slurry solids and slurry from farms and nutrients moved to farms in processed digestate from AD plants.*

AD 5 - *These movements to be recorded and notified on an update online system that the Department will implement during NAP 2026-2029. This will be a comprehensive nutrient tracking system for recording movement of organic nutrients including both farm-to-farm movements and movements to and from AD plants and other manure processing facilities.*

The manner in which the import of manures and slurries to AD plants should be handled is the Waste Management Licensing return system. This is already a requirement under Waste Management Licensing and therefore there should not be a requirement for duplication of records. We would strongly advocate that all existing AD plants in Northern Ireland should be granted Waste Licences that allow them to process manure and slurry from other farms, not just their own.

We would recommend that when an AD sends digestate to third party farms that this counts as importing of organic manure in the farm system, and digestate is then exported from the Waste Management System. Similarly, if digestate in a form consistent with either processed organic manures or consistent with a P:N ratio of 1:10 then this would be exported from the Waste Management System and imported into the farm nutrient system.

Focused approach for high-risk areas and sensitive sites

FA 1 - *The Department proposes to develop and implement a focused approach for NAP, with focused measures applied in high-risk areas*.

AgriSearch supports the principle of a catchment-based approach with voluntary measures to address water quality issues in high-risk areas. There is substantial evidence demonstrating that collaborative, locally tailored, and non-regulatory advisory approaches—such as those implemented through the Sustainable Catchment Programme, EFS Group Projects, CatchmentCARE, the Water Catchment Partnership, and Source to Tap—can deliver meaningful improvements in water quality. These initiatives have shown that when farmers are engaged voluntarily and supported appropriately, they are willing to adopt additional measures that contribute to environmental outcomes.

Given this context, AgriSearch is concerned by the proposal to introduce a more prescriptive model that could lead to mandatory regulatory measures, including the potential curtailment of farming activity, should environmental improvements not be observed. The criteria for such assessments are not clearly defined in the consultation document, and the potential implications for farm businesses in designated areas are significant. This uncertainty may discourage participation in current and future voluntary schemes, undermining the progress already made.

The Strategic Environmental Assessment (SEA), which underpins this proposal, appears to have been developed without sufficient understanding of the operational realities of the agri-food sector. Furthermore, during the DAERA Themed Workshop on Focused Areas (27 May 2025), it was indicated that participation in additional controls would be voluntary. However, the possibility of future mandatory measures introduces a level of uncertainty that may deter engagement.

AgriSearch also notes the lack of clarity regarding the scale, selection criteria, and resourcing of the proposed focused areas. This limits stakeholders' ability to provide informed feedback and raises concerns about the robustness of the consultation process.

The proposed transition from voluntary to mandatory measures, as outlined in the flowchart on page 53 of the consultation document, lacks detail on how effectiveness will be assessed. Improvements in water quality are influenced by multiple factors, including climatic and environmental conditions, and may take time to materialize. Without clear timelines and monitoring frameworks, it is difficult to evaluate the feasibility of this approach as a pilot.

There are also concerns about the potential economic and equity impacts on farms located within focused areas. If additional regulatory burdens are imposed, this could affect land values and create disparities between regions.

AgriSearch recommends that DAERA build on the success of existing voluntary, catchment-based programmes by expanding their reach and resourcing, rather than introducing a regulatory model that may face resistance and reduce farmer engagement. A well-supported advisory approach is more likely to achieve long-term improvements in water quality while maintaining trust and collaboration with the farming community.

Alternative Approaches

There are a number of alternative approaches that could be used to improve water quality without causing the severe economic impact of the proposals contained in this consultation.

AgriSearch welcomes DAERA's investment in the SULS projects and are puzzled as to why DAERA is not allowing them the time to come to fruition and supporting the development of this technology from a proof of concept to market reality.

As part of the Soil Nutrient Health Scheme DAERA has spent a large amount of money in getting LIDAR data for every farm in Northern Ireland including the production of run off risk maps. Research on the CENIT site at AFBI Hillsborough has shown that relatively small areas of planting of short rotation coppice willow at critical points along water courses can reduce P losses by 35%.

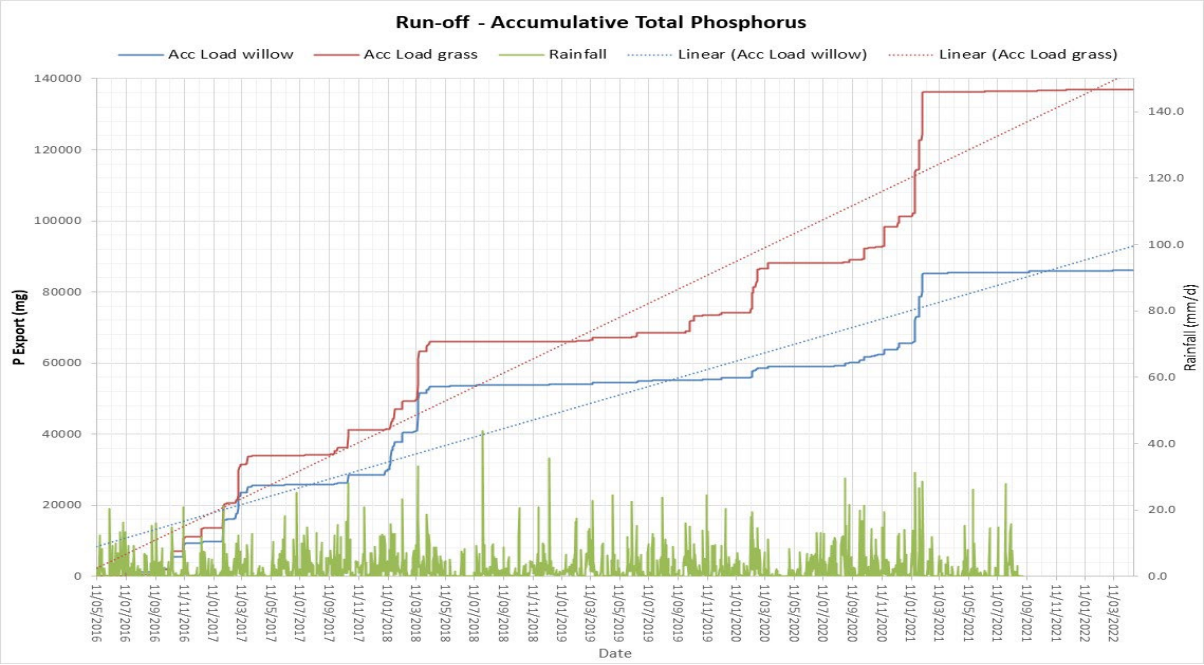

Figure 5 Results of Interreg funded CatchmentCare research at AFBI Hillsborough comparing grass only and grass and willow plots

Figure 6 Aerial Photograph of the CENIT site at AFBI Hillsborough

IMPACT ASSESSMENTS

Strategic Environmental Assessment

AgriSearch wishes to highlight several concerns regarding the Strategic Environmental Assessment (SEA) accompanying the NAP 2026–2029 consultation. Notably, there appear to be inconsistencies between the SEA and the main consultation document, which may affect the clarity and coherence of the proposals.

In particular, the SEA does not appear to fully consider the potential for unintended environmental consequences that could arise from the implementation of certain proposed measures. A more comprehensive assessment of these risks would be beneficial to ensure that the policy outcomes are both environmentally and economically sustainable.

Environmental Risks

Currently we have significant concerns that some key environmental risks are not roundly considered, in both timing and deliverability, and on occasion environmental risks are not considered in individual measures (either in the body of the text or the SEA). We have set out these risks below (1-4).

We also have concerns about the ability of farmers to adapt to the level of change in the timeframes provided. Whilst we agree that change is needed, the timing and methods of delivering those changes is extremely important – there is a significant risk that farmers who see no way to comply with regulations multiple risks to the environment are not considered in the SEA. This is reflected in many of our risks.

Risk 1 – How to balance nutrients? - The race to 150kg of manure N per ha and the resulting consequences.

Many of the measures require significant change, but none more so than the requirement to meet very different P balances when manure N >150kg/ha. Farms will do this in three ways:

a) produce less, which is economically challenging
b) remove manure once it is produced, but the ability of farmers to deploy technology to do this is virtually impossible for many areas of Northern Ireland due to the operational protocol
c) get more land for spreading manure.

Option a. is unlikely to be the preferred option at farm level, and it is highly unlikely that farm incomes can support this change (we make reference to the NIRVA Impact Assessment on IHT changes which articulates the stretch of farm incomes to meet reduction in output or additional costs as well as our own Economic Impact Assessment).

Option b. would be popular but the manner in which the operational protocol operates will restrict technology being able to be deployed despite that technology providing better results for ammonia, phosphate and GHG.

Therefore, farmers and their advisors will target option c. Others have examined this for a number of businesses through nutrient management planning, and it is very likely to be the most widespread and achievable option.

The result of this being the case, is that manure will be redirected to undesirable locations, including:

- land with only grazing livestock,
- land that is improved grassland over peat,
- land that is outside of environmental schemes but effectively hay meadow,
- land that would otherwise be planted in trees
- land that is considered to be dedicated to nature or low intensity livestock production …

This is not positive for the environment.

This is a very poorly thought-out approach and is one that requires both significant change in timing, change in approach to allow technology to be deployed that works on farms, and appreciation of the economics of what is being asked and adjustments in the operational protocol.

Risk 2: Spreading of disease and resulting increase in GHG – farm nutrient swaps may well increase disease burden on farms, driving GHG emissions the wrong way.

Farm nutrient swaps, whereby organic manures or slurries are transported between holdings to balance nutrients, may inadvertently increase the risk of spreading infectious diseases such as bovine tuberculosis (TB), Johne's disease, and swine dysentery. These diseases can be transmitted through faecal-oral pathways, contaminated equipment, or slurry, making the movement of untreated livestock manures between farms a biosecurity concern (Gates et al., 2014[50]; Skuce et al., 2012[51]). For example, Mycobacterium avium subspecies paratuberculosis (MAP), the causative agent of Johne's disease, can persist in slurry for extended periods,

[50] Gates, M.C., Vries, F. de, Green, L.E., & Gunn, G.J. (2014). Investigating the potential for biosecurity assessments to reduce the risk of Johne's disease on Scottish dairy farms. *Preventive Veterinary Medicine*, 117(1), 242–248.

[51] Skuce, R.A., Allen, A.R., & McDowell, S.W. (2012). Herd-level risk factors for bovine tuberculosis: A literature review. *Veterinary Medicine International*, 2012, 1–10.

particularly under cool and moist conditions (Larsen et al., 2007)[52]. Once introduced, chronic diseases such as Johne's can substantially reduce feed efficiency, milk yield, and fertility in dairy cattle (Gunn et al., 2004[53]), leading to increased greenhouse gas (GHG) emissions per unit of product due to reduced productivity, and directly contravening. In the case of Johne's disease, infected herds may experience up to a 14% increase in GHG emissions per litre of milk produced (Lovell et al., 2022[54]). Therefore, policies that promote inter-farm slurry movement without robust disease mitigation protocols may undermine climate goals by contributing to a rise in livestock disease prevalence and associated emissions intensities.

We respect the level of integrated change to address this is significant, and we advise much caution on the level and timing of change without dealing with critical barriers as we have outlined above. It would be a significant unintended consequence to try to reduce nutrient pollution and concurrently reduce farm efficiency. Producing PAS110 standards will of course be easier with a viable AD industry and proper management of digestate, but again this would not be possible with the operational protocol in the widespread manner that is needed.

Risk 3: Reducing production of milk will increase imports of food to the UK and Ireland which may increasing carbon leakage and overall GHG emissions, and remaining food production will exhibit higher environmental (GHG) footprints.

AFBI carbon footprinting study says:

> *….. has shown that while the agriculture sector has made relatively modest progress in reducing total Greenhouse Gas emissions (i.e. a reduction of 5.2% since 1990), dairy farming (the only sector for which carbon intensity has been estimated) has made substantial progress in reducing its emissions on a per unit of production basis (i.e. a 30.7% reduction since 1990). The reason for this improvement is that Northern Ireland has experienced continued growth in total milk production (i.e. a 67% increase since 1990) which was driven primarily through increases in milk yield per cow. (pg. 13)*

[52] Larsen, A.B., Merkal, R.S., & Vantiem, R.J. (2007). Effect of environment on survival of Mycobacterium paratuberculosis. *American Journal of Veterinary Research*, 30(2), 255–257.

[53] Gunn, G.J., Stott, A.W., & Humphry, R.W. (2004). Modelling and costing the impact of Johne's disease on milk production in dairy herds. *Veterinary Journal*, 168(2), 143–149.

[54] Lovell, R., van Winden, S., Brouwer-Middelesch, H., & Coyne, L. (2022). The impact of endemic disease on the carbon footprint of livestock production systems: A systematic review. 111964.

In reforming the Nutrients Action Programme (NAP), it is essential that DAERA ensures nutrient reduction measures do not unintentionally lead to a decline in agricultural output—particularly in Northern Ireland's dairy sector, which is among the most greenhouse gas (GHG) efficient globally on a per-litre-of-milk basis. Reductions in local production risk triggering carbon leakage, whereby food demand is met through imports from less efficient regions, undermining both environmental protection and climate mitigation objectives. A metaphorical comparison is perhaps valuable equivalent policy in other areas would see us turn off local natural gas boilers in favour of coal.

The Office for Environmental Protection (OEP), in its June 2025 advice on the NAP consultation[55], emphasised that the revised regulations must be resilient to climate change and account for the interaction of multiple environmental pressures. It specifically cited the ecological decline of Lough Neagh as a consequence of nutrient inputs, invasive species, and rising water temperatures. In this context, the NAP must be designed not only to reduce nutrient pollution but also to maintain the resilience of NI's climate-efficient agri-food sector in a changing global environment.

Northern Ireland dairy production benefits from several characteristics that contribute to its low emissions intensity:

- Grass-based production systems, enabled by the region's climate and soils, result in long grazing seasons and reduced reliance on high-emission imported concentrates.
- Efficient genetics and herd management deliver high yields per animal, reducing emissions per unit of output.
- Emissions per litre of milk in Northern Ireland average around 1.1 kg CO_2e, placing NI among the lowest in Europe, ahead of most EU countries including Germany, France, and the Netherlands.
- Improvements in nutrient use efficiency—through protected urea, low-emission spreading, and precision management—have helped maintain productivity while reducing environmental loss pathways.

However, these gains depend critically on the ability to grow grass effectively. AgriSearch has raised concerns that further restrictions on nitrogen fertiliser use, if not carefully designed, could impair the ability of farmers to maintain high grass yields, which underpin both livestock productivity and GHG efficiency. A fall in grass growth potential would likely lead to increased concentrate feeding and greater reliance on imported feedstocks, thereby increasing overall GHG intensity, nutrient surpluses and environmental externalities.

[55] https://www.theoep.org.uk/sites/default/files/reports-files/Nutrients%20Action%20Programme%20Consultation%20-%20Advice%20Letter.pdf

To reconcile environmental improvement with continued climate-efficient food production, the NAP must prioritise efficiency-based solutions—not blunt output reduction, and again we make reference to the blockade that the operational protocol puts on the deployment of technology to support reduction in nutrient loss. Measures such as mechanical slurry separation, feed reformulation, nutrient planning, and soil testing can target losses at source while sustaining yield potential. By embedding these principles, the revised NAP can deliver meaningful reductions in nutrient pollution while safeguarding Northern Ireland's ability to contribute to low-emission, resilient, and locally sourced food systems—in line with both the OEP's advice and the UK's Net Zero and biodiversity objectives.

Risk 4: Farmers with no ability to comply may be forced into positions of financial hardships that will decrease compliance and therein increase the possibility of pollution incidents and wider environmental disengagement. This is supported by a large amount of scientific research.

There is strong evidence that when environmental regulations are perceived as unaffordable or unachievable, particularly by farmers under financial pressure, this reduces compliance and may even trigger counterproductive behaviours. One of many, useful examples is that The Organisation for Economic Co-operation and Development (OECD, 2021[56]) has noted that when regulation is misaligned with the economic realities of land managers, environmental outcomes deteriorate rather than improve. This is particularly the case with policy incoherence, which we would reflect on with regards specifically with the lack of alignment between phosphorous and nitrogen.

'The absence of policy coherence – can vary in scope and degree. The most serious types of incoherence can occur when general policy goals are misaligned. For example, a government setting ambitious but divergent goals for agricultural production and environmental performance will potentially create more complex problems of policy incoherence compared to a case where goals are aligned but the implementation details of a specific programme inadvertently end up encouraging certain environmentally harmful types of agricultural practices. In the latter case, a change to implementation rules may be sufficient to restore policy coherence; in the former case, a more serious realignment of policy goals and resulting instruments may be needed.
https://www.oecd.org/en/publications/making-better-policies-for-food-systems_ddfba4de-en.html (pg. 58)

[56] OECD (2018). Environmental Compliance Assurance: A Governance Approach. Organisation for Economic Co-operation and Development. (2025) *Advice: Public Consultation on the Nutrients Action Programme 2026–2029,* p.6.

We currently are aware that despite DAERA wishing to reduce ammonia, phosphate and methane pollution, that the operational framework will prevent a small farm near Lough Neagh from processing slurry in an economically viable way to reduce ammonia, reduce methane and reduce phosphate (and reduce mineral fertiliser use).

We are also aware that a small farm managing stock levels who experience TB breakdown (which may be no fault of their own if due to back-spill from wildlife) will no longer be able to manage stock levels. In both of these examples we see the key actors for delivering these changes proposed facing significant financial hardship, and this will result in levels of disinterest and stakeholder frustration increasing. This is arguably a result of both policy incoherence but also top-down approach to complex changes.

Need for a further Strategic Environmental Assessment

Given the Minister's stated commitment to re-consult on revised measures at a later stage, AgriSearch assumes that this will necessitate the preparation of a revised SEA to reflect any changes to the proposed policy framework. It is important that any future SEA is fully aligned with the consultation content and reflects a thorough understanding of the sector's operational context.

Regulatory Impact Assessment

AgriSearch has significant concerns regarding the Regulatory Impact Assessment (RIA) accompanying the NAP 2026–2029 consultation. It is the view of AgriSearch that the RIA does not fully capture the economic implications of the proposed measures, nor does it reflect a comprehensive understanding of their potential impact on the agri-food sector and rural economy.

Several key omissions and assumptions within the RIA are noted:

- **In-field pest and disease control**: The RIA does not account for the additional costs associated with managing pests and diseases in uncultivated buffer strips. AgriSearch believes the area affected by these measures has been underestimated.
- **Silage storage**: The analysis does not consider the increased land area required to store silage bales if stacking is restricted to two high.
- **Low Emission Slurry Spreading Equipment (LESSE)**: Potential costs related to the need for more dilute slurry and the suitability of existing slurry storage infrastructure have not been included.

- **Phosphorus (P) balances**: The RIA underestimates the number, type, and size of farms affected by P balance requirements. While the RIA acknowledges costs for dairy farms, it does not consider the implications for pig and poultry operations. The assumption that non-derogated farms can operate under similar conditions as derogated farms is not supported by evidence.
- **Revised nitrogen excretion figures**: Due to the limitations in the P balance analysis, AgriSearch has limited confidence in the accuracy of the revised nitrogen excretion cost estimates.
- **Protected urea**: The projected cost savings associated with protected urea are not accepted by AgriSearch, given the practical and market-related challenges associated with its use.
- **Impact on grass growth**: The proposed reductions in chemical nitrogen use are expected to constrain grass growth, potentially increasing reliance on purchased concentrate feed—an economic impact not reflected in the RIA.
- **Administrative burden**: The RIA does not account for the additional record-keeping requirements that will be placed on farmers.
- **Digital infrastructure**: No cost assessment has been provided for the development and implementation of an organic manure import/export database or a slurry warning system.

In response to these concerns, AgriSearch has commissioned an independent economic analysis, overseen by Professor Thia Hennessey, to assess the potential impact of the proposed P balance and buffer strip measures. This analysis provides only a partial view of the total economic burden, as it does not include costs associated with LESSE equipment, reduced nitrogen fertiliser use, administrative burdens, or the use of protected urea. Even under conservative assumptions, the analysis suggests that many farms would become economically unviable, with broader implications for the agri-food supply chain and rural economy. Northern Ireland farms currently carry approximately £960 million in loans and overdrafts, and any significant reduction in livestock numbers could jeopardize the viability of processing facilities and related industries.

The estimated additional annual cost of £1.6 billion would pose a serious threat to the economic sustainability of Northern Ireland's rural economy and could lead to unintended social and environmental consequences.

AgriSearch strongly recommends that DAERA undertake a full and comprehensive economic impact assessment that includes the wider agri-food supply chain and rural communities. This is essential to ensure that policy decisions are informed by a complete understanding of their potential consequences.

Equality Impact Assessment

AgriSearch notes that the Equality Impact Assessment (EQIA) accompanying the NAP 2026–2029 consultation does not fully consider the potential differential impacts of the proposed measures on various sectors and communities. The economic analysis commissioned by AgriSearch has highlighted that the phosphorus balance and buffer strip proposals could have significant negative effects on the agri-food sector, with wider implications for rural communities. Areas of Northern Ireland that are more economically dependent on agriculture may be disproportionately affected, raising potential equality concerns.

In addition, the EQIA does not appear to assess the implications of requiring the pig sector to adopt Low Emission Slurry Spreading Equipment (LESSE) earlier than other sectors. Nor does it address the potential equality issues that may arise from the implementation of the proposed focused area approach.

Given the Minister's commitment to re-consult on revised measures, AgriSearch recommends that a revised EQIA be undertaken as part of the second consultation phase. This should include a more detailed assessment of the potential impacts on different sectors, geographic regions, and rural communities to ensure that equality considerations are fully addressed.

Rural Needs Impact Assessment

AgriSearch has identified several areas of concern regarding the Rural Needs Impact Assessment (RNIA) accompanying the NAP 2026–2029 consultation. The current RNIA does not fully recognise or assess the potential impact of the proposed measures on rural businesses and communities.

Specifically:

- **Section 2D** should be expanded to include consideration of impacts on *jobs or employment in rural areas*, *poverty in rural areas*, and *deprivation in rural areas*, all of which may be affected by the implementation of the proposed NAP measures.
- **Section 3C** outlines the methods and information sources used to identify the social and economic needs of rural populations but does not reference any economic reports or analyses consulted by DAERA in preparing the RNIA.
- **Section 3D** does not adequately identify the needs of the wider rural economy and community in relation to the proposed policy changes.

- **Section 4A** does not sufficiently address the broader impacts of the measures and appears to exclude consideration of non-farming rural businesses and rural communities.

Given the scale and nature of the proposed changes, AgriSearch recommends that a revised RNIA be undertaken as part of the second consultation exercise. This revised assessment should include a more comprehensive evaluation of the potential economic, social, and community-level impacts across rural Northern Ireland.

CONCLUSION

AgriSearch acknowledges the critical importance of protecting water quality and promoting sustainable nutrient management. However, the Nutrients Action Programme (NAP) 2026–2029, as currently proposed, represents a fundamental shift in regulatory approach that risks undermining both environmental and economic sustainability.

The proposals are characterised by:

- **Insufficient stakeholder engagement**, which has eroded trust and limited the opportunity for co-design.
- **A lack of robust scientific justification** for several key measures, particularly those relating to phosphorus balance and nitrogen fertiliser limits.
- **Inadequate economic impact assessment**, despite the potentially transformative effects on farm viability, rural employment, and the agri-food supply chain.
- **Policy incoherence**, with contradictions between the NAP and other government strategies, including climate action, ammonia reduction, and agri-food investment.

Policymakers are urged to ensure that future iterations of the NAP are:

- **Evidence-led**, with transparent use of peer-reviewed science and independent data validation.
- **Economically proportionate**, supported by full regulatory economic impact assessments and cost-benefit analyses.
- **Operationally feasible**, with clear definitions, realistic timelines, and adequate support for implementation.
- **Collaboratively developed**, through structured engagement with industry, researchers, and rural communities.

AgriSearch recognises the environmental challenges associated with nutrient management and supports the principle of continuous environmental improvement including proportionate, fair, science-based legislation. However, this needs to be achieved through **coherent, balanced, and inclusive policymaking** that recognises the complexity of agricultural systems and the need for practical, scalable solutions. We therefore cannot support the proposed changes to the NAP in their current form. The proposal NAP 2026-2029 fails to offer credible data, practical timelines, or financial clarity required for implementation. It risks undermining farm viability, competitiveness,

and the confidence of farmers who have already made significant progress under previous schemes.

A revised NAP, grounded in partnership and pragmatism, will be essential to delivering both environmental outcomes and a resilient rural economy. If DAERA follow such an approach then AgriSearch will not be found wanting in doing its part to support our farmer levy payers through our programmes of research, innovation and demonstration to do their part to improve nutrient management and water quality.

AgriSearch
Innovation Centre
Large Park
Hillsborough
County Down
BT26 6DR

T. 028 9244 6101

www.agrisearch.org

The Northern Ireland Agricultural Research and Development Council (T/A AgriSearch) is a Company Limited by Guarantee Reg No. NI35855 Registered with the Charity Commission for Northern Ireland NIC102341.