

About AHDB

AHDB's purpose is to inspire farmers and growers to succeed in a rapidly changing world.

Funded by the industry, for the industry, with a levy income of around £60 million annually, our organisation occupies a unique place at the heart of British agriculture, horticulture and the supply chain. Our activities span the whole of the UK and cover the beef and lamb, cereals and oilseeds, dairy, horticulture, pork and potatoes sectors (approximately 72% of UK agricultural output).

AHDB provides a variety of functions and services:

- Near market and applied research and innovation to tackle the everyday challenges that farmers, growers and the supply chain face
- Knowledge exchange with and between farmers, skills development and benchmarking
- Independent market analysis and intelligence to enable businesses to make informed decisions
- Building export markets for British meat, dairy products and crops
- Domestic market development to inspire our consumers

Our unique position as an arms-length body working to improve the agriculture and horticulture sector puts us in a particularly important position to support the industry to make the most of the opportunities that a new clean air strategy in England will bring. AHDB is keen to partner with the industry and government to enable it to succeed. AHDB employs more than 400 skilled and committed staff who, along with the stakeholders with whom we work in close partnership, give us a strong perspective on the challenges and opportunities the industry faces.

Our current strategy, published in December 2016, identified four over-arching priorities where we are focussing our efforts:

1. Inspiring British farming and growing to be more competitive and resilient
2. Accelerating innovation and productivity growth through coordinated R&D and KE
3. Helping the industry understand and deliver what consumers will trust and buy
4. Delivering thought leadership and horizon scanning

In responding to this consultation our intention is to offer impartial analysis and identify any unintended consequences and additional opportunities from the proposed strategy so we can support the industry and government in navigating a path towards a successful future. Our response only tackles specific Sections and Consultations where we feel able to offer insight or potential solutions we have therefore started our response at Q16.

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**Q16. What do you think of the package of actions put forward in the farming chapter?
Please provide evidence in support of your answer if possible.**

AHDB has a long track record through its research, development and knowledge exchange programmes of engaging both farmer, grower levy payers, government and other stakeholders on matters of improving efficiency of nitrogen use which consequently reduces losses to the environment including ammonia and greenhouse gasses. We are keen to continue working closely with Defra and its agencies to improve our air quality.

It is our experience that some sectors and parts of the agricultural and horticultural industries, including those which supply, support and provide market outlets, are very aware of ammonia impacts, particularly on habitats, but others less so. To make any package of measures (either mandatory or voluntary) successful, it is important that we all work together to engage the entire industry and improve understanding of its impact on air quality, and what this means for the population as a whole.

Whilst not covered in this policy consultation, we would like to see a communications package focusing on these issues in addition to Knowledge Exchange (KE) and demonstration. A wealth of knowledge and experience exists which can be harnessed to good effect to engage the industry and catalyse adoption.

Our Farm Excellence Programme, which includes a network of Strategic and Monitor Farms, seeks to improve farm performance by taking science and expertise to farmers, implementing and sharing best practice through peer-to-peer learning.

AHDB has a wide range of “Tools” and materials available, including the Fertiliser Manual RB209 that are already delivering improvements in agricultural efficiency which will deliver cleaner air. We are a leading partner in the Sector Roadmaps and Greenhouse Gas Action Plan, initiatives setting targets and measuring environmental improvement. This is an example of one initiative delivering cross benefits, reducing greenhouse gases and ammonia are complimentary activities.

We are keen that any new measures introduced as a result of this consultation, are able to offer multiple benefits including animal health and welfare, resource efficiency, plant health, and deliver progress. Multiple “wins” will deliver a more effective strategy and achieve the desired goals.

There is a role for “tools” such as carbon calculators, to help develop the Strategy, the Health and Harmony paper made reference to measuring environmental performance. We have an opportunity to develop policies and strategies which are complimentary with common goals offering long-term solutions so that a competitive and sustainable industry which delivers environmental good, including clean air can be delivered.

The farming industry recognises the need to reduce ammonia emissions and AHDB works closely with Defra and Catchment Sensitive Farming to help farmers, growers and their advisors improve nutrient use efficiency, in both crop and livestock production. In particular, Defra and AHDB work closely through the UK Partnership for Crop Nutrient Management that aims to improve on-farm nutrient management: www.ahdb.org.uk/croptonutrition.

We also work closely with Defra, the Environment Agency and Natural England on matters such as ammonia emissions from livestock housing and Environmental Permitting of pig and poultry farms. Thus, we have a great deal of experience and technical knowledge which can be shared, and is already being communicated to levy payers relating to techniques and practices, which will reduce ammonia emissions when implemented. We are keen to consider opportunities for further working with all parties.

AHDB has demonstrated its support of improving fertiliser use efficiency, by taking over the management, revision and publication of the Nutrient Management Guide (RB209) from Defra and supports this with our research and knowledge exchange activity.

We continue to work closely with Defra on a wide range of matters, recently we contributed to the Code of Good Agricultural Practice on Ammonia, have taken staff to farms and sites where low emissions techniques are employed to further their knowledge. We see this as important and something we are keen to continue.

Q17. What are your preferences in relation to the 3 regulatory approaches outlined and the timeframe for their implementation: (1) introduction of nitrogen (or fertiliser) limits; (2) extension of permitting to large dairy farms; (3) rules on specific emissions-reducing practices? Please provide evidence in support of your views if possible.

1. Introduction of nitrogen (or fertiliser) limits and Task Force.

i) Nitrogen fertiliser limits

With respect to nitrogen fertiliser applications, overall, limiting nitrogen applications is not *per se* necessarily going to result in a significant reduction in ammonia emissions. The reduction in losses associated with fertiliser use, will only apply to those farmers who are having to cut back as a result of lower upper limits and not across all use of fertiliser. This is because not all farms apply to the upper limits, either stated by Nmax, or given in the RB209 guidance. Hence reducing upper limits, by x percent, will not result in an overall reduction of x percent of ammonia emissions.

The consultation literature does not indicate what level of ammonia reduction would be achieved by extending controls on nitrogen applications down to current Nmax limits, or if the intention is to lower Nmax for all or certain crops. We would like to see these thoroughly researched before any decisions are made.

Further research and impact assessments are areas we would like to explore with Defra to help develop effective solutions. Our existing and future research programmes could contribute.

The agriculture industry has recognised membership schemes such as FACTS (Fertiliser Advisers Certification Scheme) for those advising and making fertiliser recommendations. This scheme includes an environmental module that advisers have to take and pass an examination test. Thus, industry practitioners have an awareness and understanding of how fertilisers work and the routes of loss from nitrogen products. We support such schemes and the potential for these to increase awareness further.

Advisers can make recommendations to their customers, but do not have control over the actual application, including factors such as weather conditions, which influence ammonia emissions. Whilst there are farmer/growers with the FACTS qualification, there are others with no formal training in this area.

Application and spreading is the logical next step in the chain for reducing emissions, therefore we would like to suggest the concept of user training and possibly certification, such as that already necessary to use rodenticides or pesticides is explored. AHDB supports the development and delivery of key skills to the agriculture and horticulture sectors.

Already 55% (as revised 2 August 2018) of land in England is in a Nitrate Vulnerable Zone (NVZ). In these zones, limits on nitrogen application are set on a per crop across the farm holding (Nmax). Thus, we already have one system of limiting crop nitrogen applications based on environmental criteria within these designated Zones.

With respect to the area of land not currently designated as NVZ, any nitrogen (fertiliser) limits implemented should be consistent with those within NVZ's to simplify regulation and implementation. NVZ areas have specific crop and farm nitrogen limits, there is logic to extend this elsewhere, however the NVZ system is very rigid and one size fits all. There may be areas of the country with, for example, fertile soils and long growing season, where NVZ limits would limit productivity without delivering environmental benefit.

Research is needed to evaluate the efficacy of very rigid rules such as NVZ's and developing rules which allow flexibility through a recognised decision mechanism.

Such a solution may be NVZ type rules and limits applying to all land, with the option of allowing FACTS qualified advisers to make a site specific recommendation which would be open to inspection or registered. This would allow crops to be optimised

where lower limits could compromise yield or quality. A record of the national situation can be created to provide information so the situation may be periodically reviewed.

AHDB's Nutrient Management Guide (RB209) is used by farmers and agronomists to determine a crop's nitrogen requirement taking into consideration crop type, quality (market specification), yield potential and soil nitrogen reserves within the soil. This is very much a situation specific process used to derive a bespoke recommendation for determining fertiliser applications and includes environmental considerations. Thus, a system of environmental protection aimed at reducing excessive application rates already exists, which is applicable to both NVZ and non-NVZ areas of land.

Additional regulation may make RB209 use mandatory, but we are not in a position to determine the potential outcome in terms of reduced ammonia emissions. Any system or process which will lead to improvements in nutrient management that, together with the other actions you propose, would likely reduce ammonia and nitrous oxide emissions as well as reducing nitrate leaching

RB209 does provide a mechanism to determine crop nitrogen requirement or, in other words, the amount of nitrogen a crop needs in addition to that supplied by the soil. Therefore, RB209 not only takes consideration of fertiliser and crop prices it also makes allowances for soil type, over winter rainfall, or in certain circumstances an actual measurement of soil nitrogen.

For example, a farmer planning the application of nitrogen to a wheat crop will use the soil type, the previous crop and excess winter rainfall to determine the field's Soil Nitrogen Supply Index. Excess winter rainfall is calculated annually by AHDB and circulated throughout the industry: <https://cereals.ahdb.org.uk/ewr>. In turn, the Soil Nitrogen Supply Index and soil type is used to determine the on-farm economic optimum nitrogen requirement of the crop (Figure 1). Further guidance in RB209 enables the farmer to balance organic material and fertiliser applications ensuring nitrogen is not oversupplied.

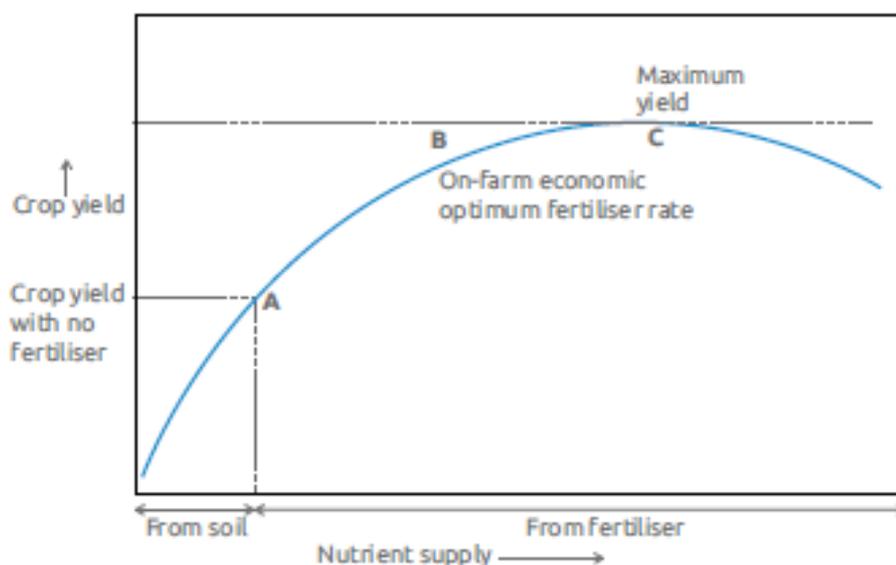


Figure 1. A typical nitrogen response curve. AHDB, Nutrient Management Guide (RB209), Section 1 Principles of nutrient management and fertiliser use, page 17

RB209 recommendations are based on the on-farm economic optimum as applications up to this point (Figure 1, point B) results in roughly a constant amount of nitrogen being left in the soil after harvest. At nitrogen rates above the on-farm economic optimum, there will be a larger surplus of residual nitrogen left in the soil at harvest. This nitrogen is at risk of loss into water as nitrate or the air as nitrous oxide.

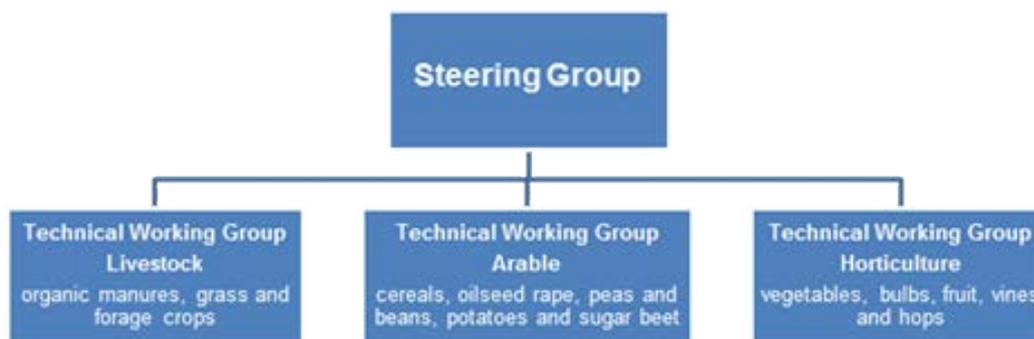
Limiting nitrogen applications below the on-farm economic optimum would reduce crop yields and crop quality, especially in the case of crops which require minimum nitrogen content to meet market specification, for example milling wheat. This will result in reduced resource efficiency as output per unit of inputs including nitrogen fertiliser, water, fuel, mechanisation and labour will be reduced. As Defra acknowledge, Denmark limited nitrogen applications below the on-farm economic optimum but reversed their decision in 2015.

ii) Task Group of independent experts to make recommendations on maximum nitrogen limits

We support setting up a task group and suggest that this could work in partnership with the existing UK Partnership for crop nutrient management (RB209 Steering Group). Each group having a clear remit and Terms of Reference. It is anticipated that some members and stakeholders would participate in both groups, hence the need for clear boundaries.

UK partnership for crop nutrient management (<https://ahdb.org.uk/projects/CropNutrition.aspx>)
 AHDB leads a partnership of organisations that aims to coordinate research and knowledge

exchange on crop nutrient management to inform revisions of RB209. The partnership is organised as a Steering Group supported by three Technical Working Groups and has published a [Plan for Research and Knowledge Transfer on Crop Nutrient Management](#).



We would like to offer our support to this proposed group and be willing to participate, which would bring beneficial expertise on nutrient management and a practical perspective on behalf of our levy payers. A key task would be to model the effect of all farmers and growers adopting best practice and applying the on-farm economic optimum rate of nitrogen.

2. Extension of environmental permitting to large dairy farms by 2025

We have and continue to work closely with, both Defra and the EA on permitting of the pig and poultry sectors, in a position that sits between these two parties and levy payers, and have gained a great deal of experience of the process and implications.

EA figures suggest that permitted pig and poultry farms have a better record than non-permitted farms when it comes to pollution incidents. We also note EA statistics which are indicating that dairy farms are responsible for a significant number of water pollution incidents and thus there may be merit in a more formal inspection regime.

We are not aware of any data, quantifying to what extent ammonia emissions have been reduced as a result of permitting, what has been achieved through genetic and productivity gains, in order to evaluate the cost effectiveness of the regime.

Clarity is required about whether permitting is to introduce a regulatory inspection system, or to control ammonia emissions as per the purpose of this strategy, or both?

Any permitting regime, based on a threshold such as livestock numbers, runs a risk of creating a barrier to not just expansion, but also improved productivity. This has happened in the pig and poultry sectors and is expected to become greater now that fees (since April 2018) have increased significantly. Whilst figures do not exist, it clear from talking to farmers and building suppliers, many farmers investing in new housing

are staying below the permitting threshold, or having to go substantially higher in order to make it cost effective.

Farmers who have become more productive are crossing the permitting threshold. Dairy farmers could be in the same position. For example, if additional land or buildings are available that offer them the opportunity to spread costs, or develop their business, for example to allow new entrants or younger generations to become involved.

We would like to see more detail about what type of permitting regime is envisaged and the likely costs. In the pig sector, for which we collect levy, the majority of new buildings from the main suppliers are the same, or very similar, regardless of the farm being permitted or not. Thus, we are seeing wide-scale adoption of BAT across the industry, not least because it simplifies suppliers product lines and is easier to make a case in the planning process.

In the case of dairy housing, within this proposal, you are also proposing minimum standards for new livestock housing. There is no current definition of Best Available Techniques (BAT) or low emission housing for UK cattle (dairy or beef), which means it is not possible to establish what changes may be required for farms to be brought up to standard, or how costs of new building may change.

AHDB is currently investigating what constitutes “low emission” housing for cattle in the Netherlands, a country that has had regulations to control the emissions of ammonia from agriculture for many years, and has the research base and practical experience from which we can learn. We are pleased that the Defra Air Quality Team are working with us in this process.

Before proposals for either specified low emission housing, or permitting can be properly considered, a full impact assessment needs to be carried out, including risk of pollution swapping, or introducing other negative consequences. This will help establish the most appropriate regime, permitting, or some other regulatory control of buildings.

Following an Impact Assessment, government, regulators and industry will need to work closely together, whatever system is determined to best deliver the objective of reducing agricultural emissions. Prior to permitting of pig and poultry sectors, we worked closely with all the other stakeholders developing guidance, rules and process which resulted in considerable cost and time savings for all. Such upfront investment is felt essential if dairy, or cattle are to be permitted.

The scope of the permit proposed is not clear, is it just to control ammonia emissions, or all pollutants and process as the case with pigs and poultry? If the latter, then the risk to the sector is much greater from the wider scope and farms not being able to meet all of the requirements and hence having to either downsize or cease production. Site specific measuring of ammonia on livestock farms is not either practical, or affordable, hence the pig and poultry sectors use “standard emission factors” as published by Defra and

the EA. Whilst this is a cost effective solution, a good, current data base of factors is required.

The planning regime where Natural England and other conservation bodies are consultees, provides a process to assess the impact of dairy and cattle farm developments. Thus, we have control processes in place where planning permission is required. This does not pick-up on change of use of existing farm buildings. Either some planning control or light touch on numbers permitting could be among the options for consideration.

The EA already have the Silage, Slurry and Agricultural Fuel Oil Regulations, and Farming Rules for Water with which to regulate farms. Thus again controls are in place already which could be extended to cover rules for buildings.

3. Rules on specific emissions-reducing practices

i) A requirement to spread urea-based fertilisers in conjunction with urease inhibitors, unless applied by injection on appropriate land by 2020.

Defra Project NT2605 (CSA 6579) WP1b, “Ammonia emissions and crop N use efficiency” provides clear scientific evidence for the use of urease inhibitors to reduce ammonia emissions from the spreading of both urea and Urea Ammonium Nitrate Solution (UAN) spread onto crops. The report also highlights that “Ammonia emissions following urea fertiliser application were shown to increase with application rate and to decrease as a result of rainfall following land spreading”.

This highlights that a degree of mitigation can be obtained by good practice, whereas inhibitors provide “catch all” mitigation. We have already highlighted earlier in our response to this consultation, that farmer training and certification could be a first stage of mitigation. This would be apply to this use of urea, the choice between urea products and ammonium nitrate, and the timing of applications.

NT2605 showed a benefit from the use of the inhibitors trialled, this was limited to products commercially available at the time. New products evolve and will have varying efficacy and chemical composition. We suggest that if urease inhibitors are to become mandatory, then a process or regulation to control minimum efficacy and chemical composition needs to be in place to protect users and the wider environment.

ii) Mandatory design standards for new livestock housing by 2022

Provided that mandatory design standards for all new livestock housing delivered BAT in terms of lowering ammonia emissions and better animal health and welfare, whilst remaining cost effective, we see this as a positive solution and would not

encounter the problems associated with permitting just part of an industry e.g. dairy.

Often low emissions flooring for example can provide other positive benefits, such as better hygiene for livestock, or lower odour, a programme of work should be implemented looking at all the benefits and disadvantages of any options prior to implementation.

We would like to work with Defra if this proposal is taken forward. AQ number of Animal welfare Codes are currently being revised, there is an opportunity to link to these and develop long-term effective solutions.

To be effective, a systems approach to BAT needs to be adopted. There must be a low emissions link from the housing, associated livestock loading and holding areas to the slurry storage, which then must be covered, and spreading (time and equipment type). If not, emission release will be moved further downstream on the farm. This is the principle behind BAT for permitting of pig and poultry sites.

This rule would help negate the need to permit dairy farming.

iii) A requirement for all solid manure and solid digestate spread to bare land to be incorporated rapidly (within 12 hours) by 2022

Whilst this may be challenging to some practitioners, the scientific evidence backs this as an effective mitigation strategy. It also provides consistency between permitted pig and poultry farms where it is BAT (BAT 22) and non-permitted farms.

Such a rule would help negate the need to permit dairy farming.

iv) A requirement to spread slurries and digestate using low-emission spreading equipment (trailing shoe or trailing hose or injection) by 2027

Scientific evidence has existed for many years to support this proposal. The use of such equipment is already mandatory in many parts of Europe and on permitted pig and poultry farms.

In addition, many farmers are already adopting these techniques on the ground of economic performance.

In comparison to other measures proposed and the potential mitigation that can be achieved, the timescale is too long.

We would like to see better and clearer definition of what types of equipment will be assessed as acceptable. In more remote areas, those with steep slopes, or where

farmers apply very limited amounts of slurry, lower tech solutions, or options such as very simple hoses, or even spreader plates which direct the slurry down may be appropriate.

It also provides consistency between permitted pig and poultry farms where it is BAT (BAT 21) and non-permitted farms.

Such a rule would help negate the need to permit dairy farming.

v) The requirement for all slurry and digestate stores and manure heaps to be covered by 2027

Again, scientific evidence has existed for many years to support the covering of slurry and digestate stores. The use of such is already mandatory in many parts of Europe and on permitted pig and poultry farms (BAT 16 and BAT 17).

There are many types of cover which can be applied to many different stores, so solutions exist, although for some large lagoons, costs may be prohibitive, these are also the stores with the largest emitting surface so logically should be tackled first.

There needs to be clear communication to ensure appropriate solutions are applied and farmers understand the options and changes in management required.

Further research may be needed to establish when stores need covering, for example, those holding very dilute slurries may not be worthwhile to cover as the cost per unit of ammonia abated will be too high.

Such a rule would help negate the need to permit dairy farming.

The covering of manure heaps we consider is less practical. Already farmers have to apply rules which govern the shape and footprint of manure stored in the field.

Our understanding of the science is that most emissions occur in the first few weeks after emptying from the building, therefore encouragement to use covered stores in this period may be a good mitigation option. Further research or evaluation of existing research needs to be conducted to establish the most practical and best value for money mitigation measures that will be complied with on farm.

Q18. Should future anaerobic digestion (AD) supported by government schemes be required to use best practice low emissions spreading techniques through certification? If not, what other short-term strategies to reduce ammonia emissions from AD should be implemented? Please provide any evidence you have to support your suggestions.

The scientific evidence supports the covering of digestate stores and the use of low emissions spreading techniques for what are, in most cases, materials with a higher ammonia emitting potential than many farm slurries. For consistency, if low emissions techniques are to be applied to farm slurries, they should also be to digestates.

The use of these techniques not only reduces ammonia emissions but increases the crop available nitrogen providing better value for the recipient crop and for off-setting fertiliser. Thus, there also gains for the carbon reduction objectives of anaerobic digestion.

Wider use of low emissions spreading technology by this sector may increase access to such equipment operated by contractors, or farmers to other farmers improving accessibility and affordability.