

Agricultural industry-led approach to Water Quality

A conditional industry offer towards reducing diffuse pollution from agriculture



Submitted to Defra Water Quality Team on 12 December 2014 and in support of the 2015 update of River Basin Management Plans

Prepared by:



Agricultural industry-led approach to Water Quality

Executive Summary

This paper summarises industry approaches that help address diffuse pollution, and proposes a conditional¹ new approach for partnership working on water quality challenges, through Campaign for the Farmed Environment (CFE), professional on-farm advisers, and partner-led activity.

Aims

We aim to:

1. Reduce agriculture's contribution to WFD failures in the longer-term through a targeted approach.
2. Increase awareness of water quality issues, and ways in which the industry can reduce the risk of diffuse pollution.
3. Identify relevant measures of success to demonstrate changes in the industry that result in improvements in water quality.

Headlines

- Agricultural industry demonstrating leadership on and commitment to, reducing diffuse pollution.
- Agriculture sector working in collaboration with Government agencies, water companies and other partners to improve water quality.
- Industry-led initiatives support and enhance the regulatory baseline and can help deliver water quality improvements at a local level.
- Agricultural industry is pro-actively making changes in farming practice in response to business drivers to find novel solutions to the challenges it faces.
- Organisations representing and advising farmers have integrated environmental issues into industry strategies, and into professional development programmes.

¹ The offer is conditional on the basis that many policy decisions are awaited in 2015. These include: CAP implementation; Countryside Stewardship; Government's long-term financial commitment to Catchment Sensitive Farming and Campaign for the Farmed Environment; the outcome of the River Basin Management Plan consultation and the outcomes from the Defra water quality and agriculture project. There is a need to understand the implications of these policy decisions and how they impact on the industry's ability to deliver the proposed approach.

Background

Water Framework Directive

Around a quarter of water-bodies in England are currently classified as being of 'good status', or higher, under the standards set down by the EU Water Framework Directive (WFD). In order to meet the requirements of WFD, sources of both point source and diffuse source pollution will need to be tackled.

Diffuse water pollution comes from many sources. These sources may be small individually but damaging collectively. Pollution sources include agriculture, urban runoff, septic tanks and misconnected or leaking drains, the national road network, mines and industrial sites. These sources contribute different substances in varying quantities across England. The key water quality challenges related to agriculture are:

- Nutrients (nitrates and phosphates)
- Pesticides
- Sediment
- Faecal bacteria

Water Quality and Agriculture Industry-led Approach

In 2013, Defra set up a project to reduce the impact of agriculture on the water environment, whilst supporting a sustainable and competitive farming industry. The Water Quality and Agriculture Project is looking at tools to address diffuse water pollution, from the commercial incentives and advice available to farmers, through to the regulatory framework. At a Ministerial Summit held in July, representatives agreed to consider how the industry could address water quality concerns, through enhancing existing activity and ensuring it is well targeted.

Agricultural improvements

Agriculture is one of many influences on water quality, and is already making a contribution towards improving water quality through improvements in efficiencies; uptake of good practice and voluntary management, as encouraged by industry-led initiatives; participation in Catchment Sensitive Farming and other incentivised schemes; uptake of agri-environment schemes; and adherence to requirements of cross-compliance and environmental protection regulations.

The UK's farming activities are also supported by a wide range of professional advisers – from agronomists to vets, from feed advisers to seed representatives. Each plays a vital role in delivering technical advice to support sustainable farming systems. Traditionally focused mainly on improving production; today, advisers are helping businesses to improve competitiveness and resource efficiency, deliver environmental objectives, and contribute to the wider sustainable intensification agenda. Combined, the schemes for professional advisers invest in the Continual Professional Development (CPD) of over 3500 individuals who give face-to-face farm advice.

In the past five years, organisations representing and advising farmers have integrated environmental issues into industry strategies, and into professional development programmes. Partnership working between farming bodies, levy bodies and the agri-supply industry has given rise to several initiatives aimed at addressing environmental concerns.

Addressing Water Quality Challenges

WFD challenges will be addressed using a combination of incentives, regulation and voluntary approaches including industry-led activity and the CPD of farmers and their advisers.

Regulation through existing legislation is used to address WFD challenges. Nitrates Regulations, Cross-Compliance, Environmental Permitting controls and anti-pollution works notices are all examples.

- Basic water protection measures are already covered by cross-compliance (Nitrate Vulnerable Zones (NVZs), No Spread Zones, Soil Protection, Plant Protection Product code and Groundwater).
- The 2008-2012 NVZ Action Programme measures in England were estimated to reduce nitrate leaching from agricultural land within NVZs by between 1-8% and phosphorus loss reduced by between 0.5-2%. NVZ designations in 2013 led to a slight reduction in the percentage of England designated as NVZs, reflecting the long-term decline in nitrates in watercourses
- Water resources control of pollution regulations², known as “SSAFO” regulations, continue to protect against point source pollution from silage, slurry and agricultural fuel oil stores.
- The number of serious incidents involving agriculture recorded by the Environment Agency (EA) has followed a decreasing trend. Pollution incidents from agriculture halved between 2000 and 2012.

Incentivised schemes consider ways of paying farmers to carry out work to protect the environment that would otherwise add cost to the farm business. Catchment Sensitive Farming (CSF), water company catchment-based initiatives and agri-environment schemes are examples.

- CSF is popular with farmers who value the provision of advice accompanied by an annual Capital Grant Scheme. CSF has engaged with 116,545 farmers between 2010 and 2014 through 1:1 visits, events and clinics. Reductions in pollutant losses in the first four years (2006-2010) of the CSF Project were generally around 5-10% (but as high as 36%) across Target Areas. We are currently awaiting the results and evaluation of Phase 3 CSF.
- Agri-environment schemes, although primarily focused on biodiversity, have delivered benefits for water quality directly through options such as riparian fencing or indirectly through options such as taking field corners out of management. Data compiled by Natural England (NE) and the EA for Soil and Water NELMS options using the uptake of agri-environment (ELS/OELS/HLS) and CSF, showed that there were over 100,000 agreements with options that benefit soil and water.
- Payments for Ecosystem Services (PES) schemes have the potential to improve water quality significantly in catchments where water companies have a direct interest in water quality (44% of England). Following the success of programs like Upstream Thinking and SCaMP, other water companies have been granted permission to fund similar projects from customer bills in the OFWAT 2014 price review, marking a significant shift towards catchment-scale water supply management in England. Upstream thinking has been successful in reducing water pollution, is financially beneficial to the farmers, and provides a 1:65 cost-benefit ratio for SWW's investment through direct savings in treatment infrastructure and indirect benefits to society. Farmers and land managers would like to see the PES approach rolled out more widely.
- Catchment approaches and initiatives are working with farmers through the Catchment Based Approach (CaBA), water company catchment initiatives and through the Catchment Restoration Fund e.g. Eden Rivers Trust, Wessex Water Catchment Initiatives, South West Water Upstream Thinking and Wye and Usk Foundation.

² Water resources control of pollution (silage, slurry and agricultural fuel oil) regulations 2010 (England), as amended

Industry-led approaches include industry-led ‘initiatives’ e.g. CFE but also a range of pro-active changes that the agricultural industry is making with support and direction from their representative organisations, such as precision-farming and CPD training on nutrient management.

Industry-led initiatives support and enhance the regulatory baseline and can help deliver at local level for protecting watercourses, in addition to other aims, such as habitat for farmland birds, wildlife and pollinators. CFE and other industry-led approaches developed by the agricultural industry help farming businesses by:

- Sign-posting best practice in soil management, crop nutrition and pesticide use.
- Providing a suite of decision-support tools, and advocating new and existing technologies which help farmers support the natural environment, whilst farming productively.
- Giving farmers the opportunity to demonstrate their ‘green credentials’ to the rest of the industry and the general public.

The agricultural industry is also pro-actively making changes in response to business drivers to find novel, creative solutions to the challenges it currently faces. The uptake of innovative technology, such as precision farming, such as the use of UAVs, or drones, is a good example of this progress. Agriculture is already making use of advances such as:

- Precision applications of farm inputs to reduce costs and improve efficiency.
- Controlled traffic farming to reduce soil damage and improve yield.
- Direct drilling to improve soil structure and reduce crop establishment costs.
- Increasing production efficiency through genetic and breeding improvements.

Take-up of new technologies and practices requires farmers and their advisers to have new and improved skills. This requires training and CPD as well as knowledge exchange and on-farm demonstration. There has been significant investment in professional development to drive the industry forward in recent years. This has been achieved with an understanding of the challenges of improving productivity while addressing environmental concerns. Industry buy-in is achieved more readily through non-regulatory approaches than a regulatory approach.

Industry approaches

Campaign for the Farmed Environment

CFE was launched in 2009, as the industry-led voluntary approach to encourage farmers and land managers to protect and enhance the environmental value of farmland, through measures that sit alongside productive agriculture. CFE is a true partnership approach, supported by many organisations committed to both agriculture and the environment (AHDB, AIC, AICC, CAAV, CLA, Defra, EA, GWCT, LEAF, NE, NFU, RSPB, The Wildlife Trusts and Water UK).

CFE achieves its aims through a combination of promoting best practice and tools, locally targeted uptake of incentivised management (via agri-environment) and CFE Voluntary Measures. CFE encourages a whole farm approach - but will sometimes focus on other themes. Recent themes include pollinator management and farmland birds, and resource protection can also be focused on in this way. Guides have recently been published focusing on good practice management of soil, nutrients and pollinators with a crop protection leaflet due in 2015.

CFE has established 30 farmer-led liaison groups in England covering all lowland counties and sub-regions; these groups come together to develop local priority plans and are uniquely placed to target measures to improve water quality. CFE Regional Coordination Teams promote CFE to lowland farms across all English counties. The teams manage Local Liaison Groups (LLGs) to establish local CFE priorities. Farmer membership organisations, government agencies, farmer-focused delivery organisations, professional farm advisers, conservation organisations and local authority and protected area partnerships are typically consulted by Local Liaison Groups to assist formulation of priority plans for CFE activity.

A number of voluntary measures directly or indirectly benefit resource protection aims of WFD (such as 6m buffer strips, winter cover crops and overwintered stubbles).

	CFE Voluntary Measure	Nitrogen	Phosphate	Sediment	Faecal bacteria	Pesticides	CFE Provided Area (ha) ³
Directly reduces pollution	VM1 – Grass Buffer strips (>6m) next to watercourse or pond	✓	✓	✓	✓	✓	17,197
	VM2 – In-field grass strips to avoid erosion	✓	✓	✓		✓	3,752
	VM3 – Management of maize to avoid erosion	✓	✓	✓			20,799
	VM4 – Watercourse fencing	✓	✓	✓	✓		6,781
	VM5 – Winter cover crops	✓	✓	✓			22,543
	VM13 – Unsprayed and/or unfertilised cereal headlands	✓	✓			✓	6,778
Indirectly reduces pollution	VM8 – Legume and herb rich temporary grass	✓					2,294
	VM15 – Overwintered stubbles	✓	✓	✓		✓	265,697
	VM17 – Field corners	✓	✓	✓		✓	13,371
	VM19 – Fertiliser free permanent pasture	✓	✓	✓			231,673
	VM20 – Arable land reverted to grass	✓	✓	✓			18,475
	VM21 – Selective use of spring herbicide					✓	34,474

Table 1: CFE Voluntary Measures that directly or indirectly reduce diffuse pollution

Co-ordinators also plan and organise events (e.g. farm walks and workshops) on behalf of the LLGs, and use opportunities for promoting CFE and raising its awareness amongst farmers and advisers. At present, CFE operates on a 1 day per week per county/sub-region basis.

CFE co-ordinators work on resource protection has taken different forms locally such as encouraging uptake of water protection measures under ELS or acting as a bridge between landowners and catchment initiatives. Recent examples include:

- CFE helped an arable farmer in the East of England to introduce 6m buffer strips for 2 miles alongside the river to protect against nutrient and pesticide loss. As a result of CFE involvement the landowner also feels far more comfortable being engaged with the Catchment Partnership. Pesticide spikes have been an issue in the catchment, so it is envisaged that the 6m wide buffer strips will help to reduce autumn spikes in metaldehyde, propyzamide and carbetamide.

³ Data from 2012/13 Defra survey

- CFE is also involved in the Frome and Piddle Catchment in Dorset to find practical ways of reducing agricultural nitrate impacting on Poole Harbour. CFE is helping farmers take ownership and buy in of the issue locally by ensuring that farmers are central to the process of delivery. CFE is working with the Wessex Water Catchment Initiative, CSF, EA and NE to ensure that farmers in the area have access to advice and guidance that best suits their individual situation so that catchment solutions are farmer-friendly.

CFE collaborates with other voluntary industry-led initiatives (Greenhouse Gas Action Plan, Tried & Tested and The Voluntary Initiative) in addition to other delivery organisations such as Catchment Partnerships and Catchment Sensitive Farming. This demonstrates that the industry is collectively taking responsibility for achieving environmental benefits alongside profitable farming.

Tried & Tested

Tried & Tested (T&T) provides tools and resources to assist farmers and their advisers in improving whole farm nutrient management in an environmentally friendly, cost effective and practical way. Key areas T&T focuses on include nutrient planning, manure management and livestock feed planning. T&T partners are AIC, BGS, CLA, LEAF, NFU and is funded by CSF.

	Nitrogen	Phosphate	Sediment	Faecal bacteria	Pesticides
Aims of Tried & Tested	✓	✓	✓	✓	

Table 2: Diffuse Pollution targeted by Tried & Tested

Voluntary Initiative

The Voluntary Initiative (VI) promotes responsible pesticide use by encouraging operator training through the National Register of Spray Operators (NRoSO), sprayer testing via the National Spray Testing Scheme (NSTS) and careful management of pesticides using an integrated approach supported by BASIS registered advice. VI sponsors are AEA, AIC, CLA, CPA, NFU, NFUS, NAAC and UFU.

	Nitrogen	Phosphate	Sediment	Faecal bacteria	Pesticides
Aims of Voluntary Initiative					✓

Table 3: Diffuse Pollution targeted by the Voluntary Initiative

Greenhouse Gas Action Plan

The Greenhouse Gas Action Plan (GHGAP) promotes improved resource use efficiency to deliver absolute and relative reductions in greenhouse gas emissions. GHG mitigation actions such as good soil management, livestock nutrition and land management risk assessment also make a contribution to meeting WFD objectives. Steering Committee Members are ADAS, AEA, AHDB, AIC, CLA, LEAF, NFU, NIAB-TAG and ORC.

	Nitrogen	Phosphate	Sediment	Faecal bacteria	Pesticides
Aims of GHGAP	✓	✓	✓	✓	

Table 4: Diffuse Pollution targeted by the Greenhouse Gas Action Plan

Relevant CFE Target

Watercourse protection is a key target for CFE:

LM3 – To maintain the area of land managed voluntarily by farmers to provide watercourse protection with an ambition to increase the area over the life of CFE

Scope: The voluntary measures that aim to enhance watercourse protection on arable and grassland farms.

Indicators of Progress

In addition to relevant targets, the following four high level Indicators have been agreed. Reflecting the new remit of CFE, these cover both the arable and lowland livestock sectors. Necessarily, each indicator will reflect the influences of several initiatives, as well as the work of all Campaign Partners.

The indicators are:

- **Indicator 1:** Attitudes to environmental land management
- **Indicator 2:** Nutrient management planning
- **Indicator 3:** Spray operator training and sprayer testing
- **Indicator 4:** Soil testing

Activity

Activities undertaken by industry-led initiatives include:

- Developing guidance materials and tools
- Awareness raising of key messages through partner organisations and supporters
- Dedicated campaigns on specific issues
- Supporting training and Continual Professional Development
- Meetings, events and workshops often held in partnership with other initiatives
- Articles and information publicised through dedicated website, magazines and press
- Working with relevant stakeholders on joint-messaging e.g. crop protection industry working with water companies on pesticide issues

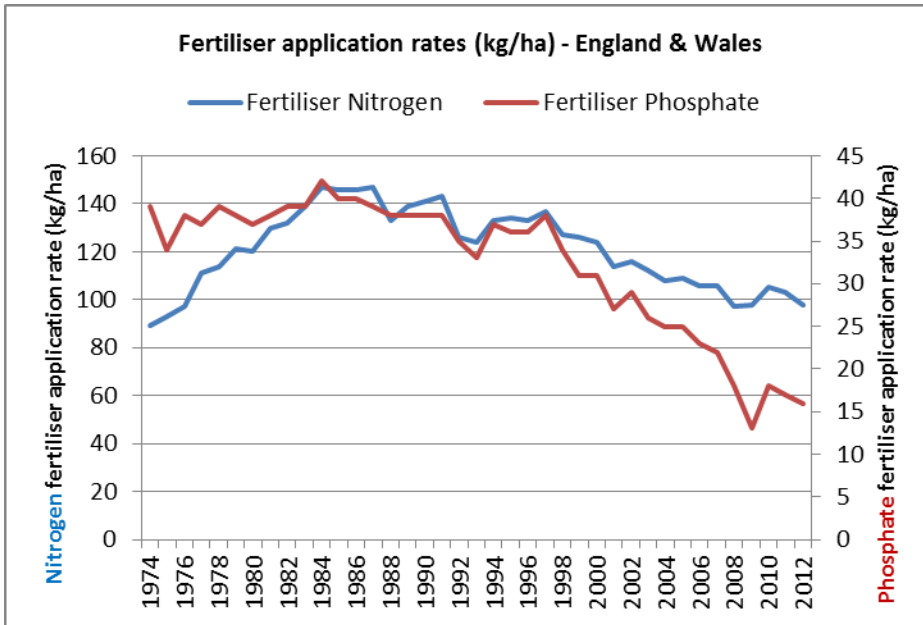
Key Successes resulting from industry-led approaches

- The proportion of farmers with nutrient management plans increased from 50% in 2009 to 60% in 2014.
- Industry data shows that the demand for tray-testing fertiliser spreading services has doubled and routine soil samples have increased by more than 15% since 2009.
- Over 1000 members have signed-up to the Feed Advisers Register since its launch in 2013, enabling advisers to keep up to date and competent in key production and environmental issues.
- Over 2200 FACTS Qualified Advisers have taken intensive additional crop Nutrient Management Planning training to bring their skills up-date and to maintain their professional status.
- There are 20,960 members of National Register of Sprayer Operators (NRoSO) and the National Sprayer Testing Scheme (NSTS) covers an estimated 89.2% of UK sprayed area.
- Monitoring of 7 pesticides at six monitoring points through a National Strategic Partnership of VI and CSF has shown exceedance of the pesticides in drinking water limit reduced by 61% over 4 years.

Long-term trends in agricultural efficiencies

Positive progress in recent years includes improved nutrient use efficiency, increased production efficiency in livestock systems; and better targeted pesticide applications using less active ingredient.

Nutrient efficiency



Fertiliser trends are shown in [Figure 1](#).

Inorganic nitrogen fertiliser use followed an increasing trend until the mid-80s. Overall, maximum nitrogen applications in England and Wales were in 1987 and the decline has been **33.3%**.

Phosphate fertiliser use has generally been in decline since records began. Overall, maximum phosphate applications in England and Wales were in 1986, the decline since then has been **60%**.

Figure 1: Long-term trends in apparent nitrogen use efficiency in England and Wales

During this time, cereal production has been relatively stable with some improvements but year-on-year variability due to factors such as weather.

Figure 2 demonstrates apparent efficiencies in the use of fertiliser N.

Similar crop production is therefore being achieved with reduced inputs, showing improving nitrogen use efficiency.

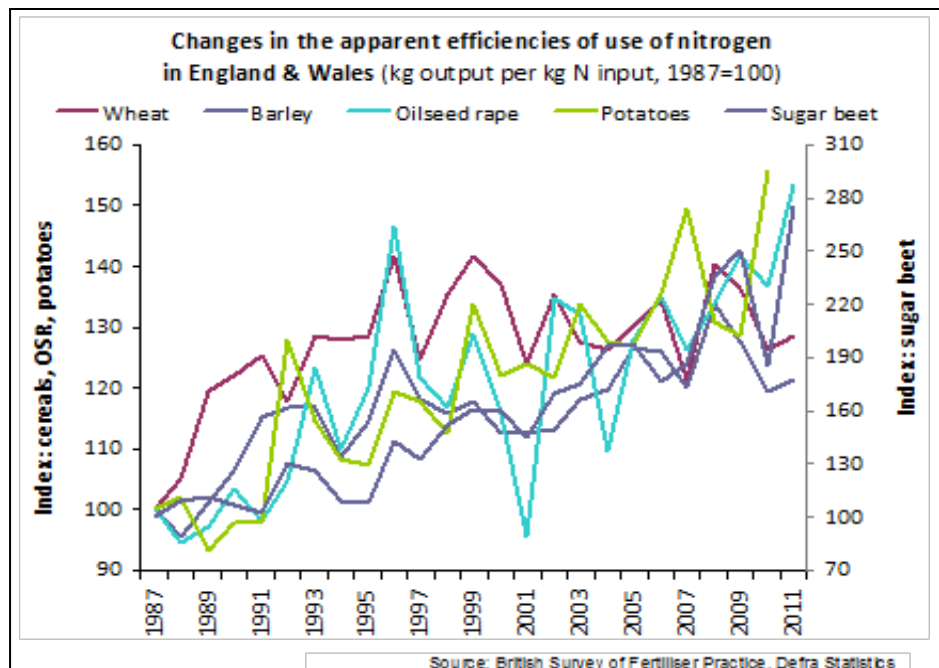


Figure 2: Long-term trends in inorganic fertiliser applications rates in England and Wales

Livestock efficiency

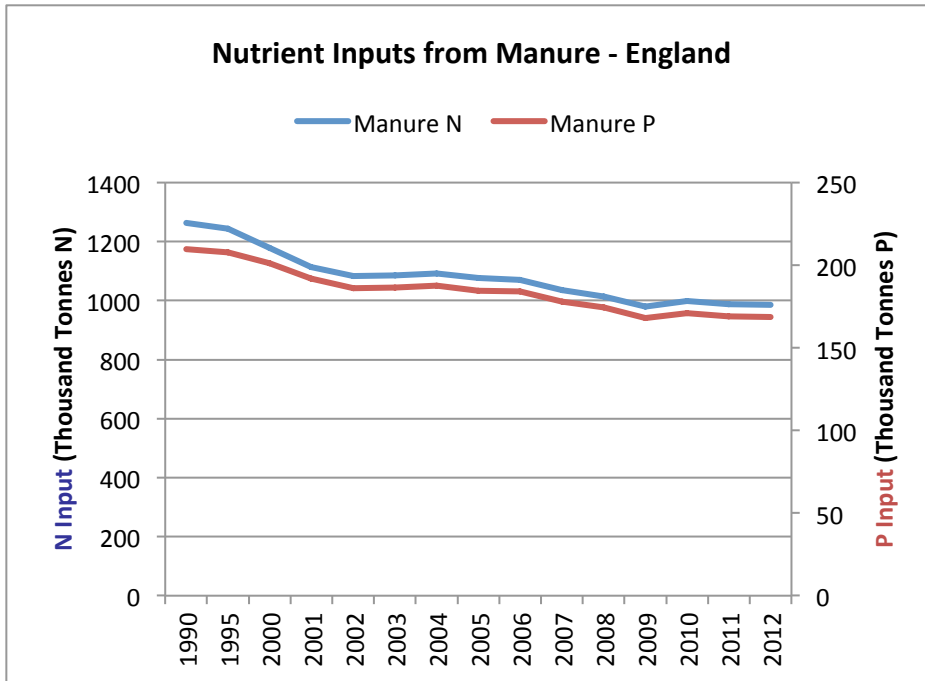


Figure 3: Long-term trends in manure nutrient inputs

Manure production and therefore nutrient inputs have reduced by around 20% between 1990 and 2012 (Figure 3).

Although largely due to decreases in livestock numbers, over this timescale improvements in productivity mean that the volume of final output has remained largely unchanged.

Despite a 20% fall in the dairy herd, there was only a 2% fall in total milk production. Similar improvements were seen in the sheep industry, with 18% fall in the breeding flock, and only a 1% fall in the production of meat.

There has therefore been a notable improvement in production efficiency in livestock farming.

Pesticide efficiency

As shown in Figure 4, over the period 1990 – 2012 the area of Great Britain treated with pesticide grew from just under 45 million hectares to around 78 million hectares. However, in the same period, there was a reduction in the weight of pesticide products used, from just under 35 million kilograms to around 17 million kilograms (a decrease of 50%).

The calculated average weight of active ingredient applied per area has therefore decreased from 0.77kg/ha to 0.22kg/ha, a decrease of over 71%.

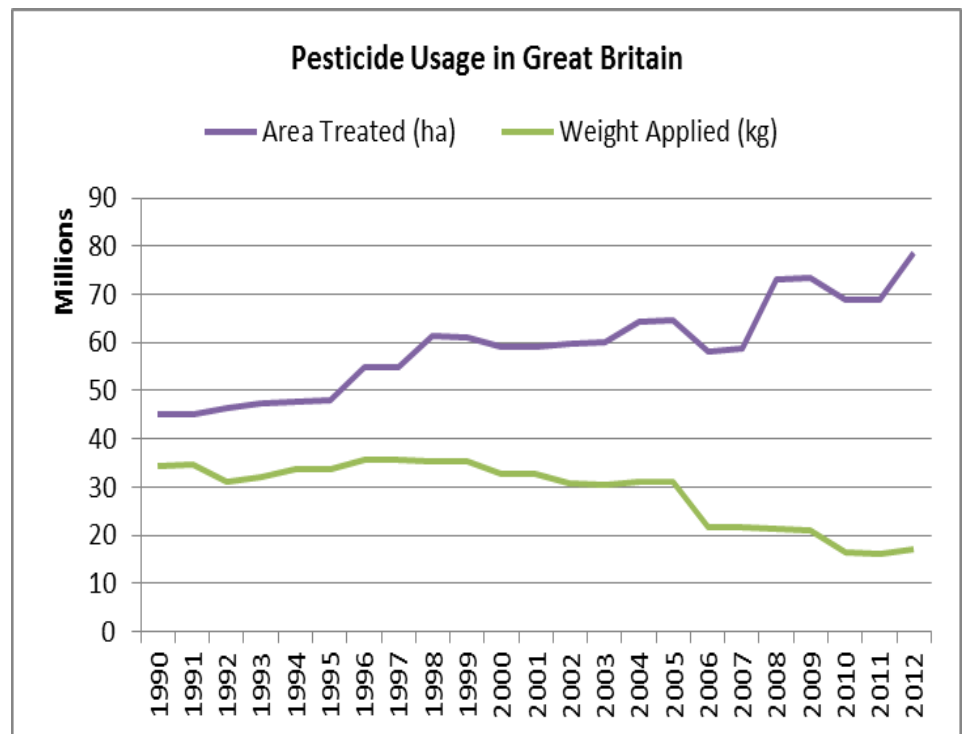


Figure 4: Long-term trends in pesticide use in Great Britain

Pesticide applications are now more targeted and using less active ingredient.

Proposed Industry Offer

Industry representatives from NFU, AIC and CLA propose an industry-led approach towards achieving reductions in agriculture's contribution to water quality in key locations.

The proposed industry offer consists of three parts:

- developing enhanced local-targeting of activity through CFE
- knowledge exchange activity by partners supporting and enhancing CFE objectives
- measuring improvements

Aims

1. Aim to reduce agriculture's contribution to WFD failures in the long-term. At present, EA data suggests that there are 3136 "reasons for not achieving good status" that are attributed to "agriculture and rural land management". However, there are different levels of certainty attributed to the data. Therefore, targeted action through industry initiatives, incentivised schemes and regulatory activity will be required, where the contribution from agricultural sources is known. **Part 1 of the offer aims to assist with the targeting of activity through the CFE by providing information to CFE co-ordinators.**
2. Aim to increase awareness of water quality issues, and the contribution that agriculture can make through voluntary uptake of good agricultural practice, existing initiatives and incentives to reduce the risk of diffuse pollution. **Part 2 of the offer aims to ensure planning of industry activity and capturing evidence of the work that industry is doing in this area.**
3. Aim to find appropriate measures of success to demonstrate changes in the industry that will lead to improvements in water quality in the long-term. **Part 3 of the offer aims to provide a measure of industry commitment and to develop indicators of change towards long-term improvements.**



Industry Offer Part 1: Campaign for the Farmed Environment

Partnership working

The agricultural industry representatives propose to form an industry working group. The approach outlined below will be carried out by the working group, with delivery dependent on CFE co-ordinators working in their existing structures (as described on page 4). As of 2014/15, one third of the CFE budget is now allocated to resource protection aims and the offer aims to work within this existing funding allocation to help target catchments and appropriate messaging.

Information gathering

The working group will be required to gather information on WFD agricultural pressures. The primary source of the information will be the EA, although the working group will need to liaise with other organisations e.g. NE, CSF and CaBA to gather all available information.

The starting point will be the “Agricultural pressures on the water environment” maps prepared by the EA and presented at the Water Quality and Agriculture Summit held on 21 July 2014.

The working group will need to consider:

- Where are the problems? – WFD locations failing to meet good status or at risk of deterioration from good status
- How much does agriculture contribute? – What evidence is available demonstrating agriculture’s contribution towards failing elements?
- Who is already working on these issues? – Where are other initiatives already operating and where are the locations not already covered by existing initiatives?
- What needs to be done? – Which industry initiatives or voluntary measure would make a difference?

Prioritisation

The next step for the working group will be to assess the information and prioritise the approach. The group will need to decide the basis upon which it will operate from the information gathered. For example:

- Whether to focus on single issues e.g. Bathing Waters, Drinking Waters, Groundwater, Natura 2000
- Whether to focus on failing elements e.g. phosphates, nitrates, bacteria, sediment
- Whether to focus on specific locations e.g. region, river basins, catchments, sub-catchments
- How to avoid duplication e.g. which other initiatives are active in the area and the messages being promoted

Targeting

Once the priorities are identified, a targeted approach for delivery will be developed. The working group will produce information summaries based on EA evidence. These will be in a standardised format and may include for example:

- Information on the local water quality issue – sources and impacts
- Source calculations demonstrating agriculture’s contribution
- Mapping to show the agricultural land that should be targeted
- Messages and measures that are likely to deliver improvements in area

The working group will provide this information to CFE local co-ordinators and CFE partners. Materials will allow CFE co-ordinators and professional advisers to focus on tailoring recommendations to specific issues in given areas.

Measures

Measures that will be selected as appropriate means for addressing specific pollution issues will be selected from:

- CFE Voluntary Measures that will deliver improvements against specific pollutants (**Table 1**)
- Advice and resources available through other Industry Approaches that target specific pollution challenges (**Table 2 – Table 4**)
- Signposting to advice available through other schemes, initiatives and approaches (e.g. Catchment Sensitive Farming, Countryside Stewardship, Catchment Initiatives and Catchment Partnerships) available in the area to deliver against specific pollution issues

Local activity

Ultimately, the approach outlined above will rely on CFE co-ordinators and Local Liaison Groups making use of the information summaries provided, working in conjunction with others in a given area e.g. EA, NE, CSF, CaBA and other partnerships and initiatives. Information summaries will help CFE co-ordinators to determine the messaging and measures required for specific water quality challenges, and to minimise duplication with other initiatives.

Recording

The working group will collate information provided by CFE co-ordinators and delivery partners on the activities that have been undertaken in target areas, the messages promoted and any feedback from post-event follow-up.

Resource implications

Partners from industry, government agencies and initiatives will be required to collate the information and produce the standardised messaging that is provided to CFE co-ordinators and Local Liaison Groups. National activity already undertaken by industry initiatives such as hosting websites, providing articles in newsletters and magazines and developing tools and resources will continue. In addition, national activity undertaken by CFE will continue, including theming messages to focus on resource protection at certain times of the year and provision of campaign literature focusing e.g. on nutrient and soil management.

CFE is theming activities on resource protection in Autumn/Winter 2014/15 with over 60 events addressing water quality in partnership with organisations including CSF, water companies, agronomists, Farm Advice Service, the Wildlife Trusts, Rivers Trusts and EA.

Industry Offer Part 2: Additional industry activity

Industry recognises that it is not operating in isolation of existing schemes, initiatives, approaches and partnerships. Industry activity therefore aims to work in partnership to avoid duplication, support and promote these routes to a farmer and adviser audience through our own communication and advice routes. These interactions are summarised in **Figure 5** below:

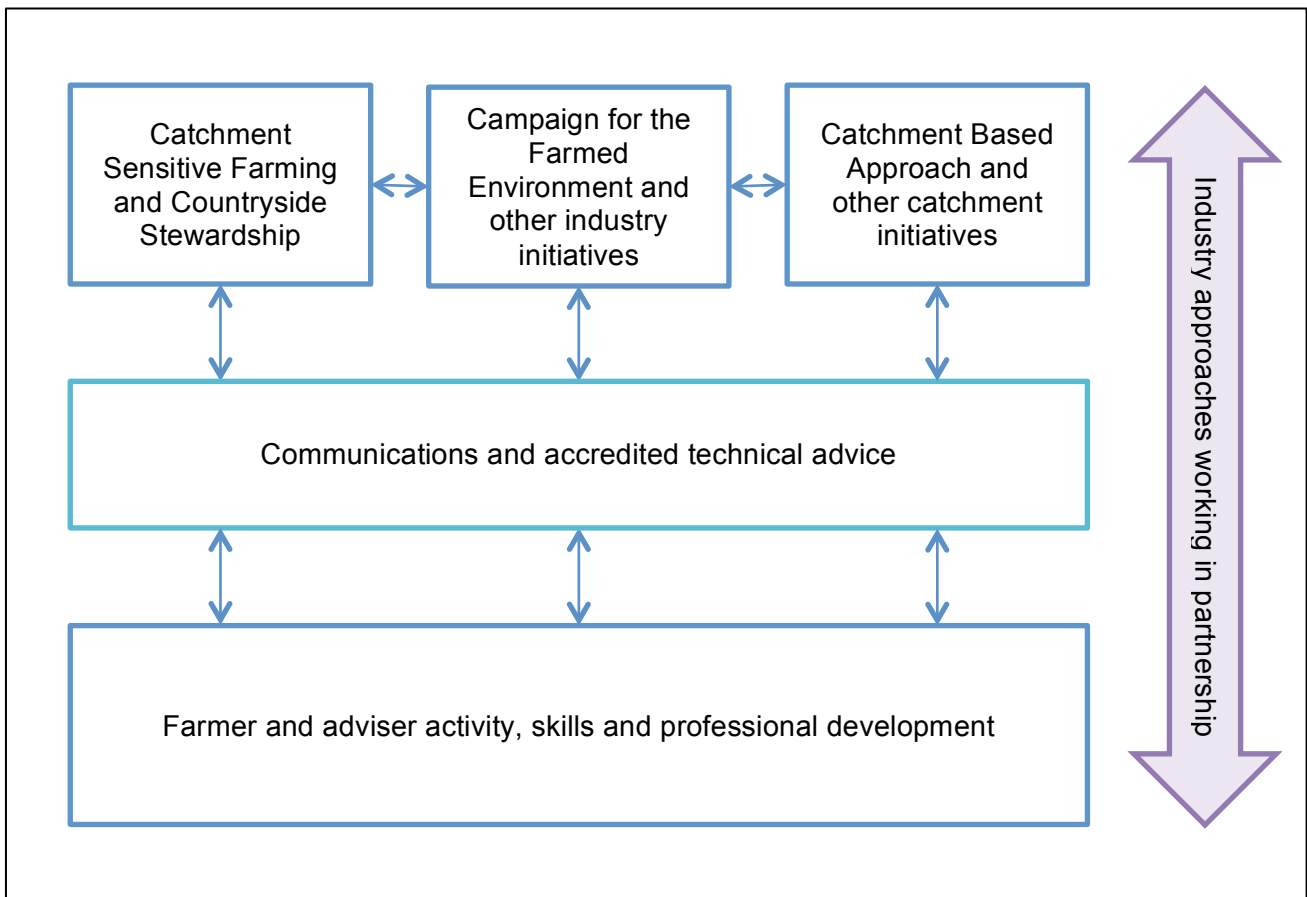


Figure 5: Relationship between existing initiatives and industry offers

The type of activity that industry will promote and disseminate information to our members will include the following activity:

Voluntarily introduce best practice measures

The industry has many routes available to communicate good practice and regulatory requirements to farmers and their advisors. Industry will base its communications on the measures in the 'Code of Good Agricultural Practice'^a which has been the basis for developing industry initiatives. The industry will also make use of the 83 measures outlined in the 'Diffuse Pollution Manual'^b in selecting the most appropriate measures that will be recommended to address specific water quality challenges in our communications.

Engage in catchment partnerships and initiatives and take-up incentivised schemes

The industry will actively promote Countryside Stewardship, CSF and Catchment Initiatives which can help our members to implement measures that will deliver against water quality objectives.

Ensure legislative and cross-compliance requirements are met

The industry will continue to carry out activity to help members understand how to comply with their legal obligations.

Agricultural industry working towards CSF Priorities

The agricultural industry, supported by its professional fertiliser and feed advisers have considered how to address CSF diffuse pollution priorities through adoption of CSF measures, promotion of practical enhanced national measures, and locally targeted measures as shown in **Table 5**.

	CSF Ref	National CSF measures adopted by industry partners and supporting advisers	Enhanced national measures	Targeted measures in hotspots
Potential delivery by 2500 FACTS Qualified Advisers	8 15	Cultivate compacted tillage soils & loosen compacted layers in managed grassland	Training in how to use What's in your backyard tool via the 'train-the-trainer' approach	Nutrient Management Plans to be signed-off by a FACTS Qualified Adviser
		Run down soil indices above 4 and build up soil indices below 2 (in support of CSF 32)	Run down soil indices above 4 and build up soil indices below 2 (in support of CSF 32)	Advise on the principles of Farmgate Phosphorus Balance – maybe with the help of a feed advisers also and further training/'apps' - <i>to be explored</i>
	12	Maintain and enhance soil organic matter levels	Sign-post to schemes offering help to establish cover crops in autumn as appropriate on a field-by-field basis	Use manufactured fertiliser placement technologies (CSF 27)
	21 67+	Fertiliser application calibration and operation accuracy (all materials, manures etc.)	Use of the right fertiliser product/nutrient source in the right place at the right time	Consider opportunities to redistribute surplus manure and biosolids over wider areas
	22+	Support tools & advice in using a Nutrient Management Plan fertiliser and recommendation system	Aim to improve nitrogen use efficiency with sulphur and optimum pH correct phosphate, potash balance	Avoid applying any phosphorus to fissured soils
	23+	Support tools and advice in integrating fertiliser and manure management supply	Adviser collaboration with CSFOs	Promote emerging solutions/technologies to P recycling with support from fertiliser manufacturers
	26 72+	Avoid applying any fertiliser material to fields at high risk times		Adviser collaboration with CSFOs
	11	Manage over-winter tramlines – signpost to help and information		
1100+ Feed Adviser Register (FAR) trained	33 34+	Support tools and advice for whole farm feed planning for cattle and sheep	Whole farm feed planning for cattle, sheep, pigs and chickens	Sign posting to CSF Manual & GHG Action Plan on-farm actions for resource efficiency
			Feeding system management expertise	Farmgate Phosphorus Balance - <i>to be confirmed</i>

Table 5: National and targeted measures to reduce nutrient loss to water

Agricultural industry working in partnership with initiatives

A good example of the industry engaging with partnership initiatives is the Chelmer & Blackwater Catchment Partnership.

The Chelmer & Blackwater Catchment Partnership was formed in 2009 between Essex & Suffolk Water, Natural England (through Catchment Sensitive Farming) and the Environment Agency, to improve water quality in a 1000km² river catchment in Essex. The Partnership works with the farming community to provide advice, guidance and practical recommendations to reduce pesticides, nutrients and sediment in the rivers Chelmer and Blackwater and their tributaries.

The activities of the Partnership are guided by input from an active Steering Group, comprised of the three Partner organisations, plus local farmers, agronomists, training providers, the National Farmers Union, Campaign for the Farmed Environment and others.

A measure of the success of the Partnership has been the level of engagement achieved with farmers and land owners, plus their advisors and agronomists, to deliver practical advice to make on-farm changes, which protect river water quality:

- 47% of 692 holdings engaged, covering an area of at least two thirds of the catchment
- 757 farmers have attended events including Pesticide Handling Area and Biobed Demonstrations, Cracking Clays workshop, Nutrient Management Planning workshops and Cover Crop demonstrations
- 507 one-to-one on-farm advisory visits conducted, such as Farm Health Checks, fertiliser spreader calibrations or soil analysis visits with farmers.
- 49 successful CSF Capital Grant applications within the catchment, securing £249,257 of investment over the past four years. These have delivered tangible infrastructure improvements to water quality and the farm businesses involved.

The Chelmer & Blackwater Catchment Partnership's branding is well recognised and respected, appearing as a single coherent delivery body to the farming community, enabling advisors to work under the same banner regardless of the organisation they work for. Farmer engagement is enhanced by the strong evidence base provided by the water quality sampling programme, which illustrates up-to-date and local levels of pesticides for each tributary and sub-catchment. The data from this water quality sampling show that farmer engagement is having a positive effect on water quality, with a steady decrease of phosphate and nitrate since the start of Partnership activities in 2009; particularly in the last two seasons, which have been wet winters. A declining trend for some pesticide concentrations in the catchment is also apparent.

Specific projects

In addition to industry-led work with CFE on water quality, industry trade bodies are involved in a range of activity towards reducing agriculture's impact on the water environment, and there is a range of cross sector collaboration between industry trade bodies and water companies:

- AIC is currently working with the EA to develop online training to reach the wide network of professional advisers which support farmers as a way of rolling out WFD training on tools and guidance.
- A partnership between the NFU and the EA is looking to tackle the problems of phosphate in two pilot catchments. The project has now started an implementation phase in Bourn Brook, Cambridgeshire and Harpers Brook, Northamptonshire following two years of work to develop the evidence base on agriculture's contribution.
- CPA and other stakeholders have developed a proposed industry-led stewardship approach for oilseed rape herbicides. The programme is proposed to provide specific advice targeted at oilseed rape herbicides where there are particular issues in some areas with surface water used for drinking water abstraction. This also provides a framework that can be used for other pesticides should the need be identified.

- 'Farm business update' meetings are organised in the Anglian region every February as a one-stop shop for farmers, providing the very latest information on environmental, water and regulatory issues to help maintain a profitable and efficient farm business in the forthcoming year. Stakeholders including CSF, FAS, CFE, the CLA, NFU, RDPE, EA, Affinity Water, Essex & Suffolk Water and Anglian Water are all involved. Further events are also organised throughout the year and have gained a reputation with farmers for being useful updates on a range of important farm business issues. There were 432 farmers and agronomists attending seven events at the 2014 Update Meetings.

Communication Approaches

The proposed approach will capture industry activity, including partnership working, training and CPD, and communications covering water quality messages, such as:

- Working in partnership on projects and initiatives aimed at specific agricultural water quality challenges in specific locations, or developing training and CPD for farmers and advisors
- Producing articles, reminders and information for membership publications e.g. NFU British Farmer & Grower magazine, the CLA Land and Business magazine, and information services for professional advisers on water quality issues
- Using newsletters and website articles to promote water quality messages
 - NFU Bulletin (weekly)
 - NFU Environment Matters (monthly)
 - NFU Regional Newsletters (weekly)
 - CLA e-news (monthly)
 - CLA Working For You (fortnightly)
 - AIC Briefings (continuous) and via newsletters for advisers (quarterly)
- Use of social media, which is increasingly being used to communicate with agricultural audiences, to promote CSF, CaBA, CFE, water company activity, regulatory requirements and upcoming events related to water quality
- Promoting messages on water quality and agriculture at meetings and events
- Working with other relevant stakeholders on joint-messaging and events
- Incorporating water quality concerns within training events organised by the industry
- Encouraging member involvement in initiatives such as CSF and water company catchment initiatives, and options for resource protection through Countryside Stewardship
- Continuing to push for technological advances in the industry that will increase productivity and decrease environmental impact e.g. precision farming techniques
- The industry does not currently capture the communication carried out through these routes, so Part 2 of the industry offer includes collating evidence on the industry activity noted above to demonstrate our commitment to making improvements (see [Industry Offer Part 3](#))

Existing industry offers

The crop protection sector has developed a separate proposed industry-led stewardship approach for oilseed rape herbicides that can be developed for other pesticides should this be necessary. There is also existing activity by the Voluntary Initiative on UK-wide pesticide stewardship (including the CPA's H2OK? campaign).

To avoid duplication with this existing proposal and activity, pesticides are not included in this proposal. However, industry representatives will work closely with the crop protection sector and ensure messages are joined-up where relevant, such as those near Drinking Water Protected Areas affected by agricultural sources.

Industry Offer Part 3: Measuring improvements

Improvements to the water environment

Diffuse pollution policies need to facilitate wide-scale collaboration between government, water companies, NGOs and farmers in all areas. However, there are gaps in the detailed monitoring of water quality in England that hinder the effective implementation and recognition of improvements as a result of pollution reduction schemes.

It may take a number of years before agriculture's contribution to improving water quality is reflected in ecological status. It is therefore not appropriate to set a target for changes in ecological status, as measured by WFD. Short-term measurements of improvements will therefore be required to demonstrate impact of industry-led approaches. These include measuring industry activity and engagement, using Defra and CFE survey data to demonstrate changes in farmer behaviour.

Further to the targets and indicators agreed by CFE, success measures and milestones that might be used in the short-term, subject to assessment by the working group, include:

Measuring outputs

- Numbers of events, meetings, etc. and of individuals directly engaged through CFE
- Analysis of CFE evaluation of 'intent to change' after events and follow-up with farmers as part of [Industry Offer Part 1](#)
- Number of information summaries sent to CFE co-ordinators by working group as part of [Industry Offer Part 1](#)
- Number of articles, news items, events and training delivered by industry (see [Industry Offer Part 2](#))

Measuring outcomes

- Analysis of data and trends on voluntary uptake of measures which support CFE target LM3, in addition to any analysis undertaken by CFE (to maintain the area of land managed voluntarily by farmers to provide watercourse protection with an ambition to increase the area over the life of CFE)
- Analysis of trends in CFE indicators of progress including nutrient management planning, soil testing and use of information to trigger specific further targeting of activity e.g. in order to target activity towards specific sectors or farm types
- Working towards an industry-led representative survey on changes in the agricultural sector to supplement Defra surveys and demonstrate changes in uptake of basic good practice in the industry
- Analysis of information and trends from Defra Survey data, e.g. the Farm Practices Survey
- Working with the EA to provide advice on how data could be used to measure outcomes
- Trends in concentrations of nutrients, sediment or bacteria from agriculture in targeted catchments with data and advice from Government agencies or local initiatives (e.g. EA, CSF and Catchment Partnerships)

^a Defra (2009) Protecting our Water, Soil and Air: A Code of Good Agricultural Practice for farmers, growers and land managers

^b Newell Price *et al.* (2011) Mitigation Measures – User Guide: An Inventory of Mitigation Methods and Guide to their Effects on Diffuse Water Pollution, Greenhouse Gas Emissions and Ammonia Emissions from Agriculture