APPENDIX 3: DEFRA PROJECTS INCLUDED IN OBJECTIVE 2 REVIEW

AC projects

AC0101 An improved inventory of greenhouse gases from agriculture

AC0102 Revising and updating the inventory of ammonia emissions from UK agriculture, for 2005 and 2006.

AC0103 Agricultural ammonia emissions as a source of UK secondary aerosol and the effect of emission abatement measures

AC0104 Emissions and abatement of dust from poultry houses

AC0105 The contribution of ammonification to N2O emissions from soils

AC0108 An appraisal of unaccounted sources and sinks of greenhouse gas, ammonia, and other emissions to air from UK land management

AC0109 Future patterns of ammonia emissions across the UK and the potential impact of local emission reduction measures

AC0111 Air quality measurements on cracking clay soils (Linked to project WQ0118)

AC0112 Producing inventories of ammonia and greenhouse gasses from UK agriculture for international reporting requirements

AC0114 GHG platform - Data management

AC0115 GHG Platform - Methane Emissions Factors

AC0116 GHG Platform - Nitrous Oxide Emissions Factors

AC0118 GHG Platform - Platform Coordinator Role

AC0119 Feed Management on Livestock Farms

AC0120 Life cycle analysis of endemic diseases on GHG emissions intensity

AC0123 Developing New Ammonia Emissions Factors For Modern Livestock Housing And Manure Management Systems

AC0124 Verification of agricultural emissions at local scale: pilot project to develop approach and provide CH4 emission estimates.

AC0201 Agroforestry systems for ammonia abatement

AC0204 A study of the scope for the application of research in animal genomics and breeding to reduce nitrogen and methane emissions from livestock based food chains

AC0205 Developing technologies to improve the fertility of dairy cows

AC0206 Agriculture and climate change: turning results into practical action to reduce greenhouse gas emissions - A review

AC0207 The translation of existing research outputs into actions that reduce pollution gas emissions from agriculture

AC0208 The limits to a sustainable livestock sector in the UK

AC0209 Ruminant nutrition regimes to reduce methane and nitrogen emissions

AC0210 Economic and environmental impacts of livestock production in the UK

AC0213 Potential for nitrification inhibitors and fertiliser nitrogen application timing strategies to reduce direct and indirect nitrous oxide emissions from UK agriculture

AC0214 Roadmaps integrating RTD in developing realistic GHG mitigation options from agriculture up to 2030

AC0216 Review of the Marginal Abatement Cost Curves for Agriculture produced for the Committee on Climate Change

AC0218 Modelling nutritional effects on reproduction in dairy cows

AC0219 Methane emissions by individual dairy cows under commercial conditions

AC0220 Factors associated with oestrous expression in dairy cows

AC0221 Scoping the potential to reduce GHG emissions associated with N fertiliser applied to arable crops

AC0222 Feasibility of Green House Gas (GHG) mitigation methods

AC0223 Extended lactations to reduce greenhouse gas emissions from dairy cows

AC0226 Quantifying, monitoring and minimising wider impacts of GHG mitigation measures

AC0227 Case Studies - Mitigation Method Interaction

AC0301 Vulnerability of UK agriculture to extreme events

AC0302 A Research and Innovation Network Supporting Adaptation in Agriculture to Climate Change

AC0304 Climate change and biodiversity in agri-environment schemes

AC0307 Climate change impacts on the livestock sector

AC0308 Ecosystem services for climate change adaptation in land management

AC0309 Scoping study on the potential impact of environmental factors associated with climate change on major UK crops

AC0310 Climate Change Impacts and Adaptation - a Risk Based Approach

AC0312 Assessing the potential for novel bioenergy crops in the UK under a changing climate.

AC0314 Identification of important crop traits for adaptation to climate change

AC0401 Direct energy use in agriculture: opportunities for reducing fossil fuel inputs

AC0402 Assessment of Methane Management and Recovery Options for Livestock manures and Slurries

AC0403 Fostering the development of technologies and practices to reduce the energy inputs into the refrigeration of food

AC0405 Potential for solar energy in food manufacturing, distribution and retailing

AC0406 The optimisation and impacts of expanding biogas production

AC0407 Reducing the carbon footprint of glasshouse production through the use of knowledge transfer and novel engineering solutions

AC0409 Implementation of anaerobic digestion in England and Wales balancing optimal outputs with minimal environmental impacts

AC0111 Air quality measurements on cracking clay soils (Linked to project WQ0118)

WQ0100NIT Use of the NIT18 infrastructure for multi-pollutant monitoring

WQ0101 Environmental Footprint and Sustainability of Horticulture (including potatoes) - a comparison with other agricultural sectors

WQ0102 Biofiltration - farm based biofilters for air and water

WQ0103 The national inventory and map of livestock manure loadings to agricultural land (Manures-GIS)

WQ0104 Contribution of overland flow on grasslands to diffuse nutrient pollution

WQ0105 Connectivity Proposal to NERC - SCIMAP

WQ0106 Cost-curves for mitigating multiple water pollutants, ammonia and greenhouse gas emissions on farms – FARMSCOPER decision support tool, USER-GUIDE and economic analysis for pollution mitigation methods

WQ0108 Maintaining cracking-clay experimental platforms (Faringdon, Boxworth and Rowden).

WQ0109 Coordination role for Defra land and water quality research (IWAM)

WQ0111 Faecal Indicator Organism Losses from Farming Systems

WQ0112 Understanding the Environmental Effects of Farming on Aquatic Ecosystems

WQ0113 UK-ADAPT - Agricultural Diffuse Aquatic Pollution Toolkit:

WQ0114 EU-LIFE (WAgrico) - Water Resources Management in Co-operation with Agriculture

WQ0116 Workshop presentation of a summary of MAFF/Defra research into agricultural environmental protection (1990 - 2005)

WQ0117 Calculator tool for estimating N and P outputs by livestock

WQ0118 Understanding the behaviour of livestock manure multiple pollutants through contrasting cracking clay soils

WQ0119 Quantification of the genetic variation for phosphorus use efficiency in Brassica napus

WQ0120 Sediment sourcing in the Demer basin, Belgium - EU diffuse pollution project

WQ0121 Upland agriculture – balancing productivity, water and soil quality

WQ0122 co-funding of RELU projects

WQ0124 Land management options for improving water quality in the uplands

WQ0125 Identification and mitigation of the environmental impacts of out-wintering beef and dairy cattle on sacrifice areas

WQ0126 Updating the User Manual (1) Modular approaches to the control of diffuse agricultural pollution: buffer zones, bioreactors, ditches and ponds

WQ0127 Updating the User Manual (2) Mitigation Options for Sediment and Phosphorus 2 (MOPS 2)

WQ0128 Extending the evidence base on the ecological impact of fine sediment and developing a framework for targeting mitigation of agricultural sediment losses

WQ0129 *Delivery of Phosphorus and Faecal Indicator Organisms from Agricultural Sources to Watercourses - PEDAL 2

WQ0131 The effect of novel crops and livestock on UK agriculture: forecast for 2050

WQ0133 A review of the energy, protein and phosphorus requirements of beef cattle and sheep.

WQ0136 UK-ADAPT (follow-on to WQ0113)

WQ0137 Modifications to ENCASH software (developed within WQ0117)

WQ0201 Water research review and gap analysis

WQ0202 Piloting a common framework for targeting and assessing the efficacy of User Manual sediment mitigation options

WQ0203 Optimising the effects of practical field-scale interventions to reduce faecal indicator fluxes impacting on protected areas as defined in the Water Framework Directive

WQ0206 Agronomic and environmental impacts of organic materials applied to agricultural land

WQ0207 Demonstration Test Catchments: Design of a monitoring strategy for the Demonstration Test Catchments project.

WQ0208 Demonstration Test Catchments: Developing the evidence base on buffer strips and other options for sediment loss from agriculture

WQ0209 Demonstration Test Catchments: Secretariat, conceptual modelling and coordination

WQ0210 Demonstration Test Catchments: Catchment scale testing of measures to mitigate diffuse agricultural pollution on the Eden

WQ0211 Demonstration Test Catchments: Catchment scale testing of measures to mitigate diffuse agricultural pollution on the Hampshire Avon

WQ0212 Demonstration Test Catchments: Catchment scale testing of measures to mitigate diffuse agricultural pollution on the Wensum

WQ0213 Demonstration Test Catchments: Development of a Data Model

WQ0214 Assessing the status of drainage in UK agriculture: A case study in the demonstration test catchments

WQ0215 Demonstrating the environmental and economic implications of reducing phosphorus excretion in pigs

WQ0218 Developing Knowledge Exchange Approaches to Secure Sustained Behaviour Changes to Deliver Multiple Environmental Benefits through Sustainable Agricultural Land Management

WQ0219 Demonstration Test Catchments: Data sharing and archival

WQ0220 Catchment Modelling Strategies for Faecal Indicator Organisms: Options Review and Recommendations

WQ0227 Reviewing the ecological monitoring in the Demonstration Test Catchments

WT03032 WQ8 CSF delivery work - English Nature

WQ0223 Developing a field toolkit for ecological targeting of agriculture diffuse pollution mitgation methods

IF0101 The rationale for defra investment in r&d underpinning the genetic improvement of crops and animals

IF0102 Informing the way forward for DEFRA grassland production R&D to support biodiversity outcomes

IF0103 Evaluating ecosystem models as tools for policy development on biodiversity

IF0104 Field-scale Impacts on Biodiversity from New Crops (extension of the RELU Biomass project)

IF0108 Delivering farm based decision support

IF0109 Selecting Genes for Function: Exploring Genetic Diversity in Grasses to Manage the Biophysical Interactions in Grassland Soils

IF0110 Framework for prioritising investment based on contribution to sustainability

IF01100 Impact of changing pesticide availability on horticulture and an assessment of all impacts and priorities on a range of arable, horticultural and forage crops.

IF01101 GPA: BB/F021038/1 Assessing the impact of climate change on the assembly and function of arable plant communities

IF01102 Identifying knowledge gaps relevant to future revisions of the Defra Fertiliser Manual for field vegetable crops

IF01103 Life history variation in weed populations: implications for weed management and adaptation in agri-ecosystems

IF01104 Establishing the scientific and mechanistic framework for a GIN

IF01105 Identifying genes that could improve nitrogen use efficiency

IF01106 Development of a toolkit for identifying host targets of Botrytis cinerea in tomato

IF01109 WHRI inflation and finalisation of guarantee for 09/10

IF0111 Setting the priorities for future work on nutrient decision support systems

IF01110 Development of appropriate variety testing methodology for assessing nitrogen requirements of new varieties in trials undertaken for national listing

IF01111 Beginning to optimise future Knowledge Transfer for Defra.

IF01112 Fertiliser Manual (RB209) grassland recommendations for PLANET

IF01114 Farmer attitudes to environmental management (CFE & ACE Observatory)

IF01116 Desk study to evaluate contributory causes of the current "yield plateau" in wheat and oilseed rape

IF01118 Integrated disease management of cereals through development of tolerance in wheat.

IF01119 Integrated management of apple scab through exploiting host genetic resources

IF01121 Validation of fertiliser manual (RB209) recommendations for grasslands

IF01122 Field margins for biocontrol and biodiversity across crop rotation

IF0113 Data resources on crop health and crop protection practice to support evidence-based policy making within Defra (Crop Monitor)

IF0114 The development of a fertiliser recommendation system

IF0116 Improved understanding of dormancy in problem broad-leaved weeds

IF0117 Review of the scientific literature to determine the extent of knowledge on the impact of crop management strategies on soil microbial populations

IF0118 An electronic database for the curation of historic crop fertiliser response trials (incorporating maintenance for the NPK model server).

IF0120 New pre-breeding, crop improvement R&D for grass and forage crops

IF0121 Potential for grass for new industrial market or as an environmental break crop in arable rotations farming

IF0122 Potential for greater use of legumes in grassland systems for improved biodiversity, soil fertility and livestock health

IF0124 Development of an integrated management framework and approaches for livestock farming systems

IF0125 Defra Oilseed Rape Genetic Improvement Network (OREGIN)

IF0126 Arable crops ecosystems - habitat diversification, crop management and natural enemies for crop protection and biodiversity

IF0127 Contribution of intergrated crop management practices to Defra objectives

IF0128 The impact of shortened rotations on rhizosphere microbial diversity

IF0129 Strategies to exploit risk assessment, genetic resistance and natural defences against crop diseases

IF0130 The potential for increasing spring cropping for environmental value

IF0131 Assessment of reduction in environmental burdens through targeted measures compared with whole farm approaches in cropping and livestock systems

IF0133 Data resources for the Fertiliser Information System

IF0134 Transfering improved hop germplasm for UK hop variety development to industry

IF0137 Assessment of the factors influencing land-use in arable ecosystems and the implications for arable ecosystem biodiversity within the context of climate change and reduction of set-aside

IF0138 How does change in land-use between set-aside and cropping impact soil biodiversity and function?

IF0139 Oilseed rape ecology - crop and margin management to encourage natural enemies for crop protection and biodiversity

IF0140 UK Environmental Change Network - Drayton

IF0141 Planet update for Nitrate Vulnerable Zones

IF0142 Sequencing the gene space of potato chromosome IV, comparative analysis with tomato and development of a genebased mapping platform (contribution to a BBSRC project)

IF0143 Modelling the spatial and temporal management of land-use to optimise biodiversity

IF0144 OREGIN - Pre-breeding research to support climate change adaptation and reduction of the environmental footprint of Oilseed rape

IF0145 Understanding and dissecting the genetic control of key "environmental impact" traits in forage grasses and legumes

IF0146 The Wheat Genetic Improvement Network (WGIN) - Improving the environmental footprint of farming through crop genetics and targeted traits analysis

IF0147 Defra Pulse Crop Genetic Improvement Network

IF0149 Determining strategies for delivering environmentally sustainable production in the UK ruminant industry through genetic improvement

IF0152 Towards identification of beneficial alleles controlling traits for sustainable production: SNP discovery in Brassica oleracea

IF0153 A literature review of the effects of pesticides on micro-organisms during composting, and of the degradation of biodegradable plastic films and packaging during composting

IF0154 A preliminary assessment of the greenhouse gases associated with growing media materials

IF0155 Extension to UK Environmental Change Network (ECN)

IF0156 Production of a TILLING population and DNA pools as strategic resources for lettuce crop improvement

IF0157 Leafy Vegetable Genetic Improvement Network (VeGIN): Pre-breeding research to support sustainable farming of leafy vegetables and salads

IF0158 Vegetable Genetic Improvement Network (VeGIN): Pre-breeding research to support sustainable farming of carrot and onion.

IF0159 Assessment of changing arable disease and pest status through long-term data collection and analysis

IF0164 Vegetable Landrace Inventory of England and Wales

IF0168 Improved resolution of QTL associated with Water and P use efficiency

IF0169 Underpinning tools to be utilised by the ruminant GIN

IF0170 Estimating the quantitative environmental impacts of a package of potential set-aside mitigation options

IF0171 Development of PLANET version 3 (project follow on from IF0114)

IF0173 Pilot genomic approaches for studying honey bee biology and improving bee health

IF0174 Identification of candidate genes for resource-use-efficiency by genome-wide association mapping in Arabidopsis thaliana.

IF0175 Critical review of recent policy-relevant research in carbon and nitrogen cycling

IF0176 Fertiliser Manual Decision support Gap Filling (Field Vegetables) and facilitating the next steps in nutrient decision support systems

IF0177 Low carbon and low input production systems – scoping study

IF0180 Review of molecular characterisation studies relating to UK Farm Animal Genetic Resources

IF0182 Would livestock breeding goals change if carbon and nitrogen efficiency, rather than economic efficiency, were the priority objectives?

IF0183 Review of nutrient efficiency in different breeds of farm livestock

IF0185 Environmental Change Network - Drayton. Defra funds several ECN sites in a NERC/cross-funder project monitoring climate and other change (Drayton in Central England is the only site funded by FFG - those with more natural habitats are ERG-funded)

IF0188	Plant pathogen populations in wild and agricultural hosts and interactions with plant genotype
IF0189	Long term maintenance and genetic diversity of F1 hybrids in genetic resource collections using UK Brussels sprouts as a model
IF0190	Screening the Brassica napus DFS population for nutrient acquisition traits
IF0191	Wild brassica screen for virus resistance (Wibsvir). Pre-breeding research to support sustainable farming of brassicas in the UK
IF0192	Assessing future threats to arable weed management from pesticide Legislation, climate change and invasive species
IF0193	Developing resources to identify sources of host resistance to Sclerotinia disease and variability in pathogen aggressiveness
IF0197	Verticillium longisporum in oilseed rape: understanding a disease new to the UK
IF0198	Consultancy on Campaign for the Farmed Environment
IF0205	BB/H012176/1 Genetic diversity, and yield stability for increased resilience against climate change in the UK
IF0207	Developing options to deliver a substantial environmental and economic sustainability impact through breeding for efficiency of feed use in UK beef cattle
IF0209	Improving the resistance of legume crops to combined abiotic and biotic stress

Appendix 4

Measures removed from Objective 2 list in 1st filter

Source	Category	Description of measure/action	Reason for exclusion
IF0124	Stock management	Use of existing and 'traditional' farm buildings for multiple uses	Not specific
IF0131	Land management	Do not deliberately pick, collect, cut, uproot or destroy protected wild plants	Cross compliance
IF0131	Land management	Protected trees are not cut down (without permission)	Cross compliance
IF0131	Land management	Wild birds (and their eggs) are not intentionally killed, injured, taken or disturbed when nesting	Cross compliance
Farmscoper	Stock management	Make use of improved genetic resources in livestock	Profitable farming
IF0131	Energy	Produce bio fuel feedstock on farm	Other funding source
IF0131	Energy	Produce biomass fuel on farm	Other funding source
IF0127	Land management	Arable - A diverse winter sown rotation with at least 3 different crop types	CAP
IF0127	Crop management	Use trap cropping to reduce pest risk	Potentially profitable
Farmscoper	Land management	Cultivate compacted tillage soils - Loosen compacted soil layers on arable land	SPR A9, A10 (p30)
Farmscoper	Land management	Loosen compacted soil layers in grassland fields	SPR I4 (p47)
IF0131	Crop management	Use shallow cultivations (max depth of 10 cm), Minimum tillage (Adopt reduced cultivation systems)	Profitable farming
IF0127	Land management	Match cultivations to crop, weeds, soil type and season	Profitable farming
IF0127	Land management	Control stem-base diseases	Profitable farming
IF0127	Crop management	Maintain good intercrop hygiene e.g. residues incorporated to reduce disease and pest pressure in following crops	Profitable farming
User Guide	Land management	Convert land to biomass cropping (willow, poplar, miscanthus)	Other funding source
IF0131	Energy	Use heated air for drying grain	Profitable farming
IF0124	Stock	Ventilation requirements efficiently delivered - optimum fan performance	Profitable farming

	management		
IF0124	Land management	Maintain grass pastures at optimum heights, excess grass cut and utilised	Profitable farming
IF0131	Stock management	Increase concentrate feeds in diet of ruminant livestock	Profitable farming
IF0131	Stock management	Livestock are provided with a diet that provides sufficient nutrients (e.g. energy, protein, minerals) to meet the daily demands for maintenance and production	Profitable farming
IF0131	Nutrients	Use fertiliser spreading equipment with a low spreading trajectory, that is, below 4 metres from the ground	SMR 4 (NVZ'S) A 6 and 7 (for slurry)
Farmscoper	water	Irrigate crops to achieve optimum yield	Profitable farming
IF0127	Water	Avoid irrigating before it rains	Profitable farming
IF0131	water	Avoid irrigating when it is windy	Profitable farming
IF0131	water	Irrigate at night	Profitable farming
IF0131	water	Schedule irrigation to take account of evapotranspiration or soil moisture deficits	Profitable farming
Farmscoper	Stock management	Reduce field stocking rates when soils are wet	SPR I7 (p47), and link to SPR G8 (p.43)
IF0131	-	Reduce the number of ruminant livestock	Not specific
IF0127	Manure Management	Apply manures and composts to increase organic matter	SPR A2 (p30), B4 (p34) ,
User Guide	Land management	Maintain and enhance soil organic matter levels	SPR A2 (p30), B4 (p34) ,
	Manure Management	Store solid manure heaps away from watercourses/drains	SMR 4 (NVZ'S) B9
Farmscoper	Manure Management	Incorporate manure into the soil	SPR A2 (p30), B4 (p34) ,
Farmscoper	Manure Management	Do not apply manure to high-risk areas	SMR 9 B7 & 8
IF0124	Nutrients	Spread manures to land in compliance with a Manure Management Plan	SMR 4 (NVZ'S) A1
IF0124	Nutrients	Time manure / slurry applications to land to maximise fertiliser value and minimise pollution	Profitable farming
	Land management	Devote at least 4% of land to non-crop habitats (e.g. wild bird seed mixtures, floristically enhanced grassland, natural regeneration)	CAP
Farmscoper	Nutrients	Use a fertiliser recommendation system	Profitable farming
Farmscoper	Nutrients	Integrate fertiliser and manure nutrient supply	Profitable farming
Farmscoper	Nutrients	Replace urea fertiliser to grassland with another form (e.g. ammonium nitrate)	Profitable farming

Farmscoper	Nutrients	Replace urea fertiliser with another form (e.g. ammonium nitrate)	Conflict ammonia vs N2O
Farmscoper	Nutrients	Incorporate a urease inhibitor into urea fertilisers for arable land	Profitable farming
Farmscoper	Nutrients	Do not apply P fertilisers to high P index soils	Profitable farming
IF0131	Nutrients	Accurate calculation of nutrient requirements of arable crops	Profitable farming
IF0131	Nutrients	Accurate calculation of nutrients available in livestock manure used on arable crops	Profitable farming
IF0131	Nutrients	Accurate calculation of nutrients available in livestock manure used on grassland	Profitable farming
IF0127	Nutrients	Adjust the timing and amounts of split applications as accurately as possible	Profitable farming
IF0127	Nutrients	Have a nutrient management plan	SMR 4 (NVZ'S) A1
Farmscoper	Nutrients	Do not apply fertiliser to high-risk areas	SMR 4 (NVZ'S) B4, 6
Farmscoper	Nutrients	Avoid spreading fertiliser to fields at high-risk times	SMR 4 (NVZ'S) B5
IF0131	Land management	Use no crop zones	Not specific
?	Land management	Valuable trees are felled and removed	Not specific
IF0131	Crop management	Do not spray when heavy rain is forecast; or when soil is very wet and drains are running.	Profitable farming
IF0127	Pesticides	Ensure all spray operators trained to appropriate level	Cross compliance
Farmscoper	Pesticides	Fill/Mix/Clean sprayer in field	Profitable farming
IF0131	Pesticides	Maintain pesticide equipment to prevent leaks and failures	Cross compliance
IF0131	Pesticides	Only use legally approved pesticide products	Cross compliance
IF0131	Pesticides	Use pesticide products in accordance with any requirement or condition specified in the approval or in any extension of use or on the label of the product as required by the approval or extension of use	Cross compliance
IF0131	Pesticides	Pesticide stores are capable of retaining spills and leaks	Cross compliance
IF0131	Pesticides	Use pesticide products that are less toxic to aquatic fauna and flora	Legislation
IF0131	Pesticides	Use pesticide products that are less toxic to birds	Legislation
IF0131	Pesticides	Use pesticide products that are less toxic to mammals	Legislation
IF0131	Pesticides	Use pesticide products that are less toxic to non-target invertebrates	Legislation
IF0131	Pesticides	Use pesticide products that are not Endocrine Disrupting Chemicals (EDCs) to aquatic fauna	Legislation
Farmscoper	Pesticides	PPP substitution (where possible use active substances that have reduced toxicity to wildlife and humans)	Legislation
IF0131	Pesticides	Use air-assisted pesticide sprayer - reduces drift	SMR 9 Code of practice for using plant protection products p 91

IF0131	Pesticides	Use low drift nozzles when applying pesticides	SMR 9 Code of practice for using plant protection products p 91
IF0127	Pesticides	Use appropriate dose techniques (apply the correct rate of pesticides to control the problem in the field)	SMR 9 Code of practice for using plant protection products p 92
Farmscoper	Pesticides	Drift reduction methods	SMR 9 Code of practice for using plant protection products p 92
IF0131	Pesticides	Hard surfaces where pesticides are handled drain into proper sewers or treatment facilities	SMR 9 Code of practice for using plant protection products table 4 p66
IF0127	Pesticides	Have a crop protection management plan	SMR 9 Code of practice for using plant protection products
IF0131	Pesticides	Pesticide handling facilities are located at least 10m away from any watercourses or vulnerable sites	SMR 9 Code of practice for using plant protection products p75 4.5.1
IF0131	Pesticides	Ensure that your pesticide store is secure and located more than 10m away from a watercourse and/or drain	SMR 9 Code of practice for using plant protection products
IF0131	Pesticides	Regularly calibrate pesticide sprayers used on non-food crops (incl grass and forage)	SMR 9 Code of practice for using plant protection products p 44
IF0127	Nutrients	Include legumes/fertility building crops in the rotation	New ES option
IF0127	Crop management	Plan rotation and spatial separation to minimise disease problems	Profitable farming
IF0127	Crop management	Plan rotation and spatial separation to minimise pest problems	Profitable farming
IF0127	Crop management	Plan rotational strategy to take weed control into account	Profitable farming
IF0131	Crop management	Use a diverse crop rotation to reduce the incidence of weeds, pests and diseases in food crops	Profitable farming
IF0131	Crop management	Use a diverse crop rotation to reduce the incidence of weeds, pests and diseases in non-food crops (incl grass and forage)	Profitable farming
IF0131	Nutrients	Do not exceed the limits for the average annual rate of addition through sewage sludge of toxic elements on arable soils	Legislation
IF0131	Nutrients	Do not exceed the limits for the average annual rate of addition through sewage sludge of toxic elements on grassland/forage soils	Legislation
Farmscoper	Crop management	Use plants with improved nitrogen use efficiency	Profitable farming
IF0131	Reducing waste	Avoid plastic film wastage during wrapping	Profitable farming
User Guide	Land management	Maintain field drainage systems	SPR A1 (p30)

IF0127	Water	Ensure field drainage is maintained	SPR A1 (p30)
IF0131	Stock management	Increase in milk yield per dairy cow	Profitable farming

Appendix 5

Measures removed from Objective 2 list in 2nd filter

Source	Category	Description of measure/action	Reason for exclusion
CCA Workshop	Stock management	Replace current livestock breeds with ones better suited to new (e.g. hotter, drier, more saline) conditions to take advantage of new opportunities	Management choice
CCA Workshop	Crop management	Take measures to protect crops from storm damage (shade/hail netting, trees / hedges)	Management choice
CCA Workshop	Crop management	Diversify crop varieties/species to hedge bets against unpredictable weather	Management choice
	-	Use correctly-inflated low ground pressure tyres	Management choice
IF0131	Land management	Do not sub-soil or mole-plough	Management choice
IF0131	Nutrients	Incorporate crop residues	Management choice
IF0131	Land management	Shallow spiking, slitting or sub soiling	Management choice
IF0127	Land management	Time cultivations carefully with respect to prevailing weather and soil conditions	Management choice
IF0131	Energy	Use bio fuels	Management choice
IF0131	Energy	Use biomass fuel	Management choice
IF0131	Energy	Use electricity sourced from suppliers who use renewable sources	Management choice
IF0131	Energy	Use energy efficient lighting	Management choice
IF0131	Energy	Use hydro-power	Management choice
IF0124	Stock management	Use of energy-efficient or natural light sources	Management choice
IF0124	Stock management	Use of heat recovery systems	Management choice
IF0124	Stock management	Use of light dimmers and timers to save power	Management choice
IF0124	Stock management	Use of powered ventilation systems	Management choice
IF0131	Energy	Use solar power	Management choice
IF0131	Energy	Use wind power	Management choice

IF0127	Crop management	Alter drilling date to ensure optimal crop establishment Drill early to allow establishment ahead of certain pests Drill late to reduce weed presure and allow cultural control of weeds prior to drilling	Management choice
IF0131	Land management	Arable land is sown with a crop within 10 days of having been prepared as a seedbed	Management choice
IF0127	Crop management	Avoid early sown or out of season crops	Management choice
IF0127	Crop management	Consider increasing seed rate in some circumstances	Management choice
IF0131	Crop management	Establish a low plant population (less than 200 plants/m2) if drilling early (before October)	Management choice
IF0131	Stock management	Avoid unsuitable supplementary feeding	Management choice
Farmscoper	Stock management	Improved feed characterisation	Management choice
IF0131	Crop management	Use of chopper feed mechanism on balers to maximise the dry matter conserved per unit of film	Management choice
IF0124	Animal Nutrition	Use of enzymes, digestive enhancers and chemicals in feed	Management choice
IF0124	Animal Nutrition	Use of feed systems that minimise physical wastage	Management choice
IF0124	Animal Nutrition	Use of higher quality feeds for better efficiency	Management choice
User Guide	Stock management	Use of hormones and increased milking efficiency	Management choice
IF0124	Animal Nutrition	Use of permitted co-products	Management choice
CCA Workshop	Climate Change Adaptation	Planning to deal with changes and losses including natural disasters such as floods and fires	Management choice
CCA Workshop	Land management	Use precision farming methods	Management choice
IF0131	Crop management	Harvest grain at optimum moisture content	Management choice
IF0124	Animal Health	Active use of farm health plans	Management choice
IF0124	Animal Health	High health status, low mortality	Management choice
IF0124	Animal Health	High standards of bio security	Management choice
IF0131	Stock management	Injured or ill livestock receive immediate attention, including veterinary treatment if required	Management choice
IF0124	Animal Health	Routine use of other health services (e.g. foot trimmers)	Management choice
IF0124	Animal Health	Use of biological controls for pests and parasites	Management choice
IF0124	Animal Health	Use of prophylactics (vaccines, dips etc.) and medications	Management choice

IF0131	Stock management	Vaccination to reduce rumen methanogens	Management choice
IF0131	Crop management	Use biological control on food crops	Management choice
IF0131	Crop management	Use mechanical or flame weeding on food crops	Management choice
IF0131	water	Do not irrigate crops	Management choice
IF0131	water	Irrigation equipment is maintained	Management choice
IF0131	water	Use boom irrigation	Management choice
IF0131	water	Use self-closing trigger nozzles on hosepipes	Management choice
IF0131	water	Use trickle irrigation	Management choice
IF0124	Stock management	Use of recycled water for house cleaning Optimal	Farm resource efficiency
IF0131	water	Reuse plate cooling water on dairy farms	Farm Resource efficiency
IF0131	Crop management	Choose a variety with a high standing power score (on the Recommended List) on lodging-prone sites	Management choice
User Guide	-	Change from a solid manure to a slurry handling system	Management choice
User Guide	Manure Management	Change from a slurry to a solid manure handling system	Management choice
IF0131	Manure Management	After slurry/manure application, pasture is not grazed for one month, preferably eight weeks, or until all visible signs of the slurry solids have disappeared	Management choice
IF0131	Nutrients	Do not use sewage sludge on grassland/forage land where the limits for PTEs have been exceeded or will be exceeded if the sludge is applied	Management choice
IF0131	Nutrients	Do not use sewage sludge on grassland/forage soil that has not been properly sampled and analysed	Management choice
IF0131	Manure Management	Do not graze livestock or harvest forage crops for 3 weeks after applying sewage sludge	Management choice
IF0131	Manure Management	Do not locate field manure heaps in any single position on arable land for more than 12 consecutive months	Management choice
IF0131	Manure Management	Do not locate field manure heaps on arable land in the same place as an earlier one constructed within the last two years	Management choice
IF0131	Manure Management	Do not locate field manure heaps on grassland in the same place as an earlier one constructed within the last two years	Management choice
IF0124	Nutrients	Use of aerators for slurry systems	Management choice
Farmscoper	Nutrients	Incorporate a urease inhibitor into urea fertilisers for grassland	Management choice
IF0131	Nutrients	Restrict applications of nutrients to arable crops when plant uptake is low	Management choice

IF0131	Nutrients	Restrict applications of nutrients to grassland when plant uptake is low	Management choice
delete	Nutrients	Do not use sewage sludge on arable land	Management choice
IF0131	Nutrients	Do not use sewage sludge on arable land where the limits for PTEs have been exceeded or will be exceeded if the sludge is applied	Management choice
IF0131	Nutrients	Do not use sewage sludge on arable soil that has not been properly sampled and analysed	Management choice
delete	Nutrients	Do not use sewage sludge that has not been properly sampled and analysed on arable soils	Management choice
IF0131	Nutrients	Do not apply sewage sludge to grassland/forage soils with a pH of less than 5	Management choice
IF0131	Nutrients	Apply fertilisers and manures under the growing canopy of the crop	Management choice
IF0131	Pesticides	Clean up any spills or splashes of pesticide immediately	Management choice
Farmscoper	Pesticides	Construct bunded impermeable PPP filling/mixing/cleaning area	Management choice
IF0131	Nutrients	Predict crop nutrient requirements using canopy management or chlorophyll testing	Management choice
IF0131	-	Ensure that all fuel oil delivery/transfer pipe work is maintained and undamaged	Other
IF0131	-	Ensure that oil storage facilities are located more than 10m away from a watercourse and/or drain	Other
IF0131	-	Fixed fuel tanks are bunded	Other
CCA Workshop	Climate Change Adaptation	Industry planning to take advantage of new opportunities (e.g. ability to grow new crops, longer growing season, new markets)	Management choice
IF0131	-	Maintain equipment - regularly check the condition of your pumps, mains and hydrants and repair worn items such as seals	Management choice
IF0131	water	Oil storage facilities are located at least 50 metres away from any borehole, spring or well	Other
IF0131	Land management	Use low ground pressure tyres/wheels on machinery	Management choice
IF0131	Pesticides	Reduce the height of the sprayer boom	Management choice
IF0131	Pesticides	Reduce the travelling speed of the sprayer	Management choice
IF0131	Pesticides	Regularly calibrate pesticide sprayers used on food crops	Management choice
IF0131	Pesticides	Replace caps on pesticide containers after rinsing and draining and store them upright in an outer carton	Management choice
IF0131	Pesticides	Operators are steady on their feet when pouring pesticides directly into a tank, preferably on the ground or a platform at the right height	Management choice
IF0131	Pesticides	Pesticide handling facilities are located at least 50 metres away from any borehole, spring or well	Management choice
IF0131	Pesticides	Pesticide handling facilities are located away from existing farmyard flash flood routes, rain water outlets and gutter outfalls	Management choice
IF0131	Pesticides	Pesticide handling facilities are not located above any tile or mole drains	Management choice

IF0131	Pesticides	Use closed transfer systems for pesticide sprayer filling	Management choice
IF0131	Pesticides	Use a fill-level alarm, flow meter or pre-set shut-off valve when filling sprayers	Management choice
IF0131	Pesticides	Use a suitable funnel and fill slowly so air can enter while pouring when filling sprayers	Management choice
IF0131	Pesticides	Sprayers are washed in a bunded area and washings are collected	Management choice
IF0131	Pesticides	Sprayers are washed in the field	Management choice
IF0131	Pesticides	Sprayers are washed on biobeds	Management choice
Farmscoper	Pesticides	Treatment of PPP washings through either; disposal, activated carbon or biobeds	Management choice
IF0131	Pesticides	Use spray additives	Management choice
IF0131	Pesticides	Use plant growth regulators (PGRs) on cereal crops	Management choice
IF0127	Pesticides	Use narrow spectrum PPPs	Management choice
IF0131	Pesticides	Use no spray zones	Management choice
IF0127	Crop management	Identify crops at risk by forecasting, sampling, monitoring or trapping and using thresholds	Management choice
IF0131	Crop management	Use biological control on non-food crops (incl grass and forage)	Management choice
IF0127	Crop management	Use cultivations to control pests (e.g. slugs)	Management choice
IF0131	Crop management	Achieve the correct airflow during grain drying	Management choice
CCA Workshop	Crop management	Install facilities for drying grain (to protect against losses from wet harvests)	Management choice
IF0131	Crop management	Use ambient air for drying grain	Management choice
	-	Reduce air leakage from crop stores	Management choice
CCA Workshop	Crop management	Improve seed and crop storage facilities to deal with changes in moisture and temperature as well as possible increases in pests	Management choice
IF0131	Energy	Improve (or fit) better thermostatic controllers in crop stores	Management choice
IF0127	Crop management	Exploit the characteristics of competitive and vigorous varieties to improve yields without increase in requirement for pesticides / nutrients	Management choice
IF0127	Crop management	Grow resistant varieties wherever possible	Management choice
CCA Workshop	Crop management	Plant new and more diverse feed and forage crops (to protect against feed shortages in extreme weather situations)	Management choice
CCA Workshop	Crop management	Replace current crop varieties with ones better suited to new (e.g. hotter, drier, more saline) conditions to take advantage of new opportunities	Management choice
delete	Crop management	Use disease resistant varieties	Management choice

IF0131	Crop management	Use drought resistant crop varieties	Management choice
IF0131	Crop management	Use high yielding crop varieties	Management choice
IF0131	Reducing waste	Recycle pesticide packaging	Management choice
IF0131	Reducing waste	Reuse or recycle fertiliser packaging	Management choice
delete	Reducing waste	Reuse or recycle plastic crop covers	Management choice
IF0131	Reducing waste	Reuse or recycle plastic silage wrap/sheet	Management choice
IF0131	water	Fix dripping taps	Management choice
IF0124	Animal Nutrition	Use of mains water supply	Management choice
IF0124	Animal Nutrition	Use of own local water supply	Management choice
IF0124	Stock management	Use of sprinkling or misting systems	Management choice
IF0131	water	Water leaks are repaired	Management choice
IF0127	Crop management	Use cultural control for weeds where appropriate	Management choice
IF0131	Crop management	Use mechanical or flame weeding on non-food crops (incl grass and forage)	Management choice