

# Drivers affecting soil management and agronomy

A Defra perspective

**Dr Murray Hart**

Nutrient Management Team, Farming for the Future Programme

## Social

- Population growth

- Demand for food

## Economic

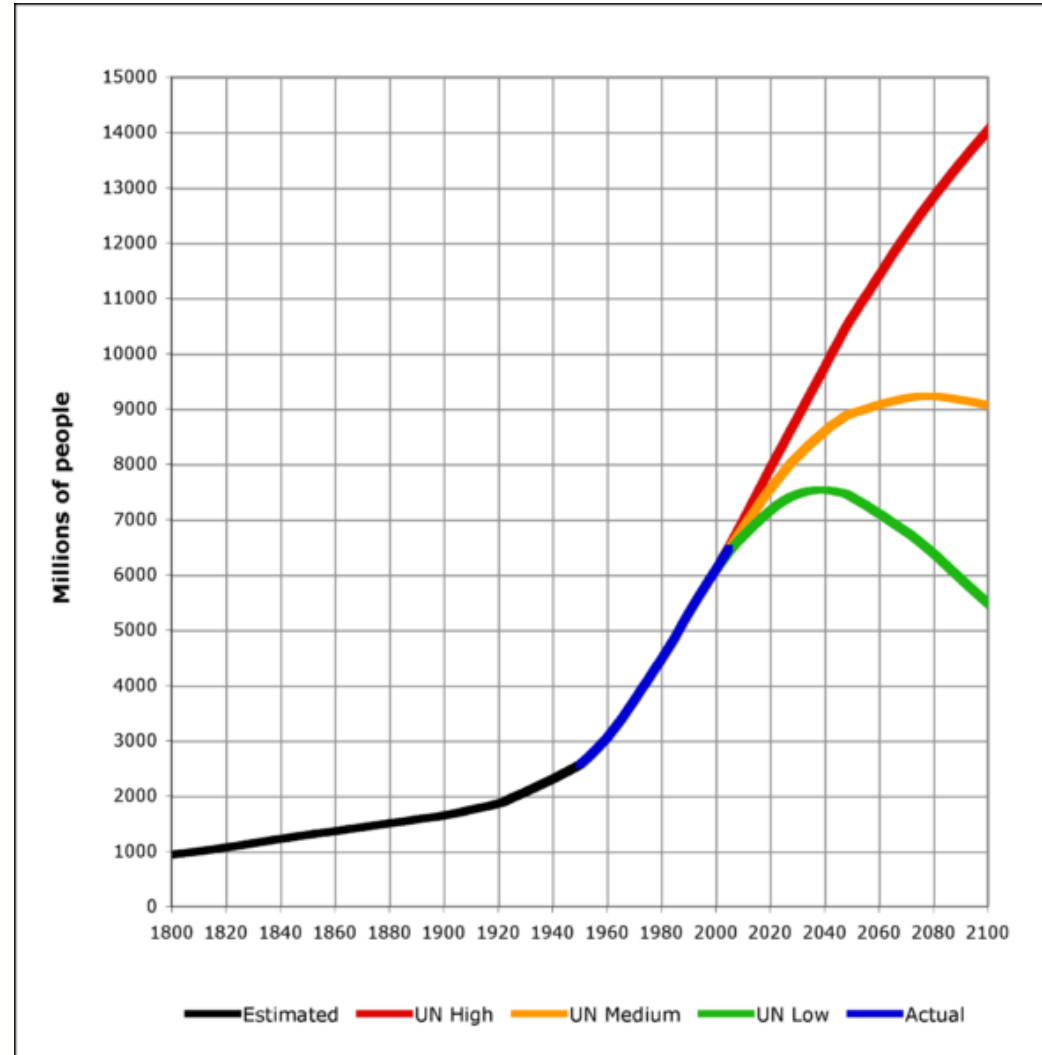
- Global recession

- Increasing costs for farmers

## Environmental

- Climate change

- Water, air, soil quality



# Impacts from farming systems



**defra**  
Department for Environment  
Food and Rural Affairs

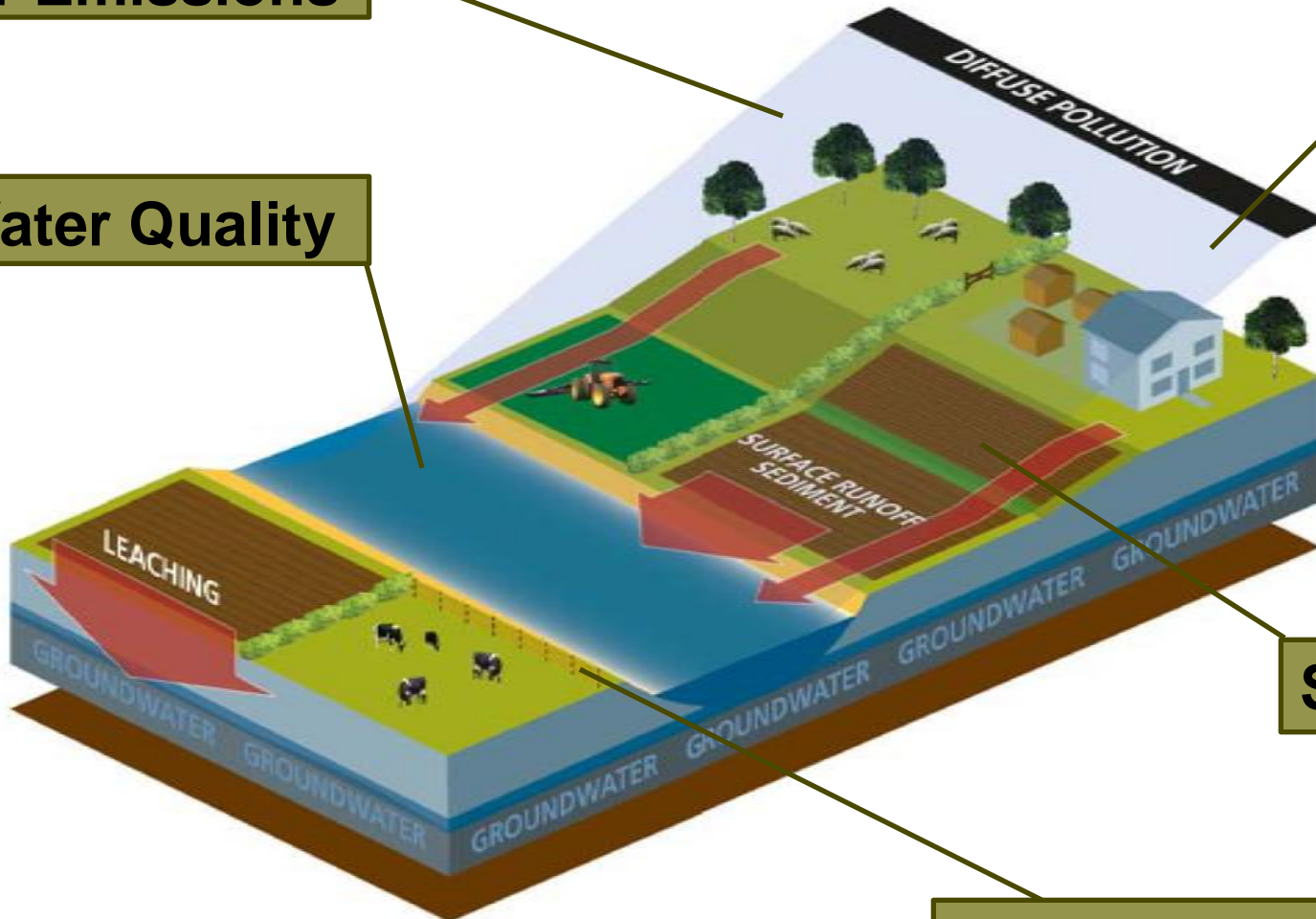
**Air Emissions**

**Odours**

**Water Quality**

**Soil Quality**

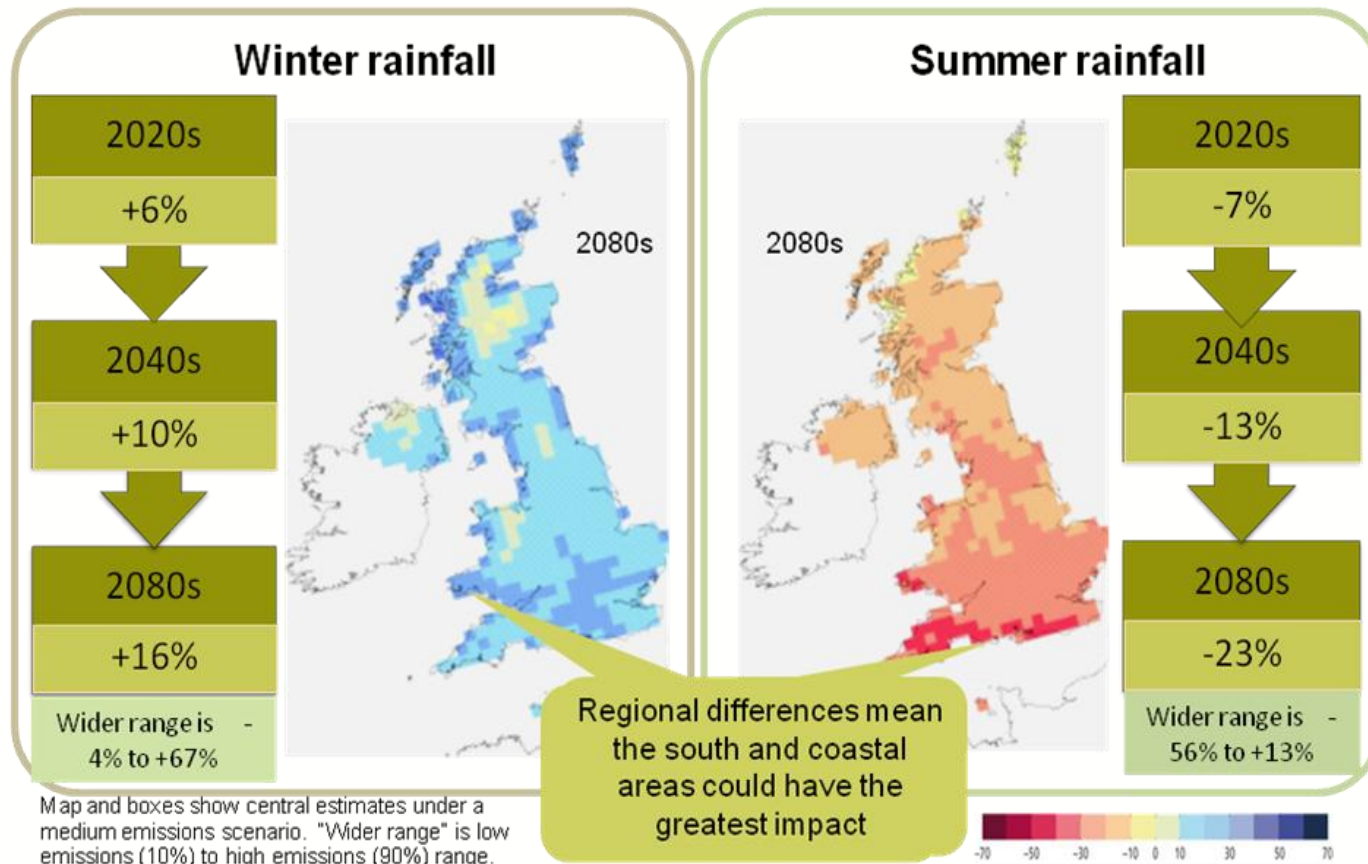
**Biodiversity Loss**





# Climate change: We are already locked into climate change for the next few decades. What is going to happen?

- UK Climate Projections published in June 2009
- Projections under three scenarios: low, medium and high emissions



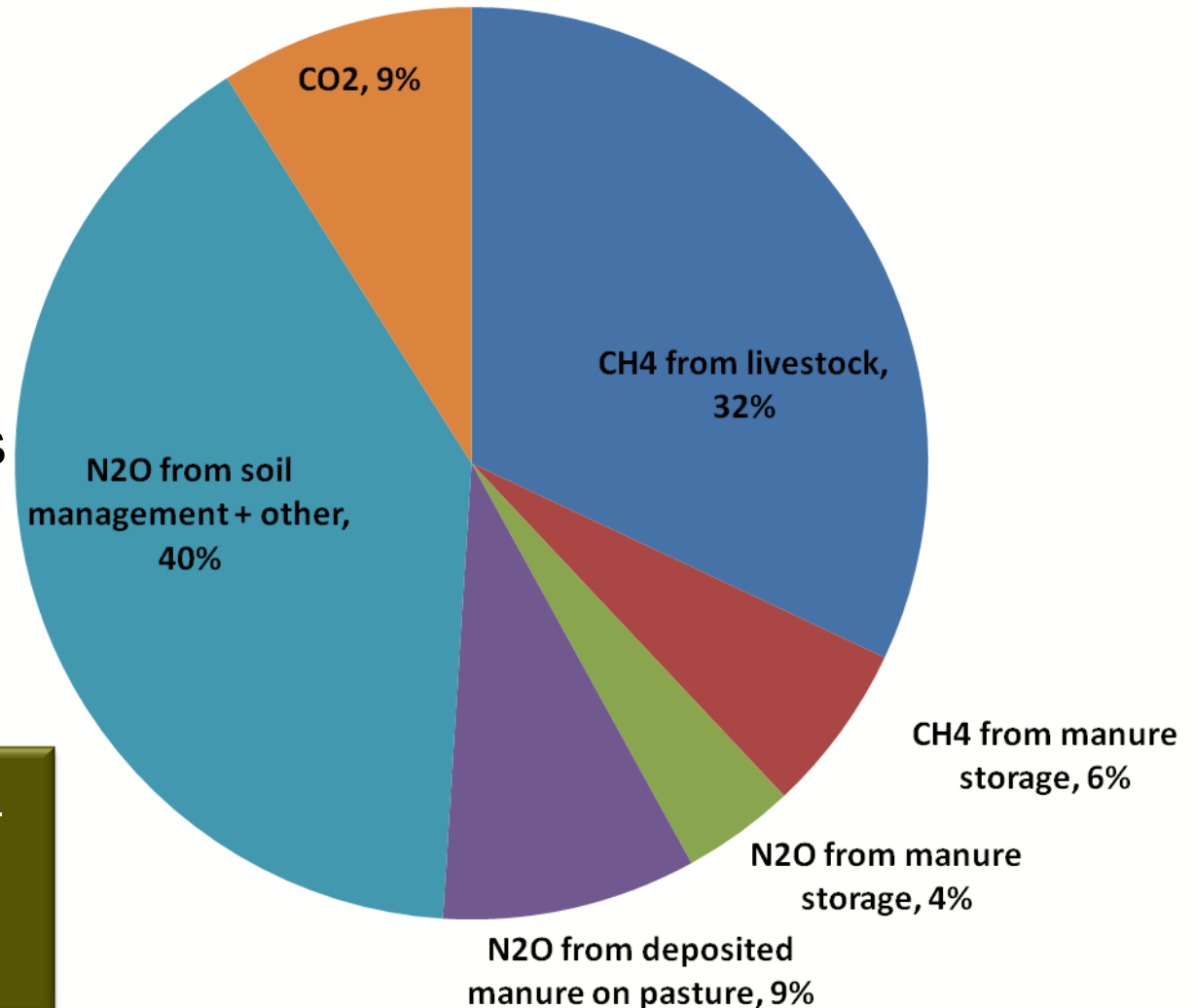
# Carbon budgets: the UK's framework for action on climate change

- Climate Change Act 2008 commits us to at least 80% (below 1990 levels) reduction in all GHG emissions by 2050
- First three carbon budgets announced April 2009:
  - **22% reductions in 2008-12**
  - **28% reductions in 2013-17**
  - **34% reductions in 2018-22**

**Below 1990 levels**
- Action will be needed across all sectors of the economy, including the agriculture sector

# Where do UK agriculture emissions come from?

The Agriculture Sector Represents about 8% of total UK GHG emissions



## Global warming potential

$\text{CH}_4 \sim 25 \times \text{CO}_2$

$\text{N}_2\text{O} \sim 300 \times \text{CO}_2$

- RoTAP – Review of Transboundary Air Pollution; need for NH<sub>3</sub> control  
[www.rotap.ceh.ac.uk](http://www.rotap.ceh.ac.uk)
- UNECE Task Force on Reactive N;  
recommendations for agricultural control
- NECD / Gothenburg Protocol renegotiations  
for 2020 ceilings

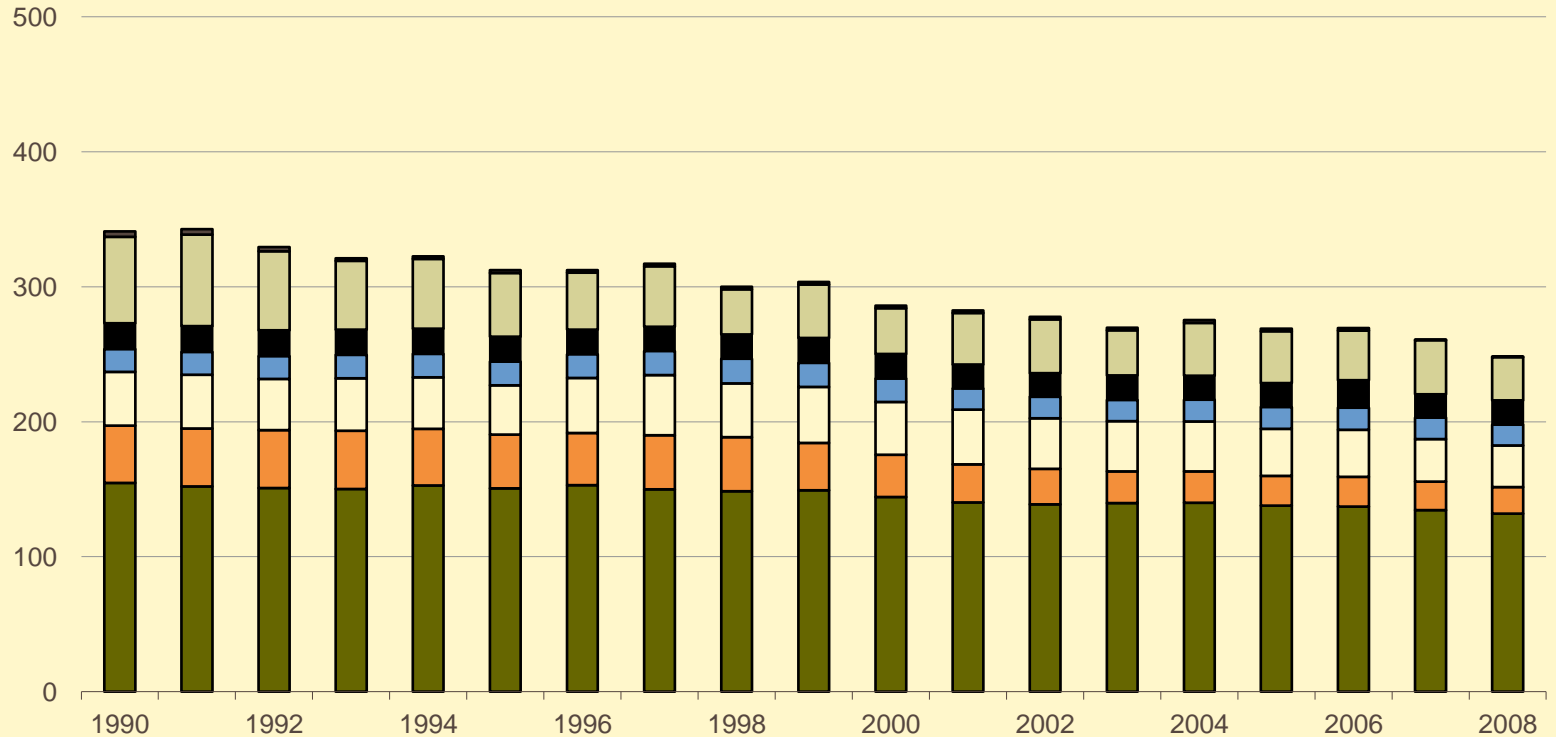
# Trend in NH<sub>3</sub> emissions



**defra**  
Department for Environment  
Food and Rural Affairs

## DC1a UK Ammonia emissions from agriculture

k tonnes



- Field burning of agric. waste
- Other livestock
- Cattle
- Direct soil emission
- Poultry
- Manure management
- Swine

Source: AEA Energy & Environment, Defra



# What can farmers do?

## Efficient use of resources

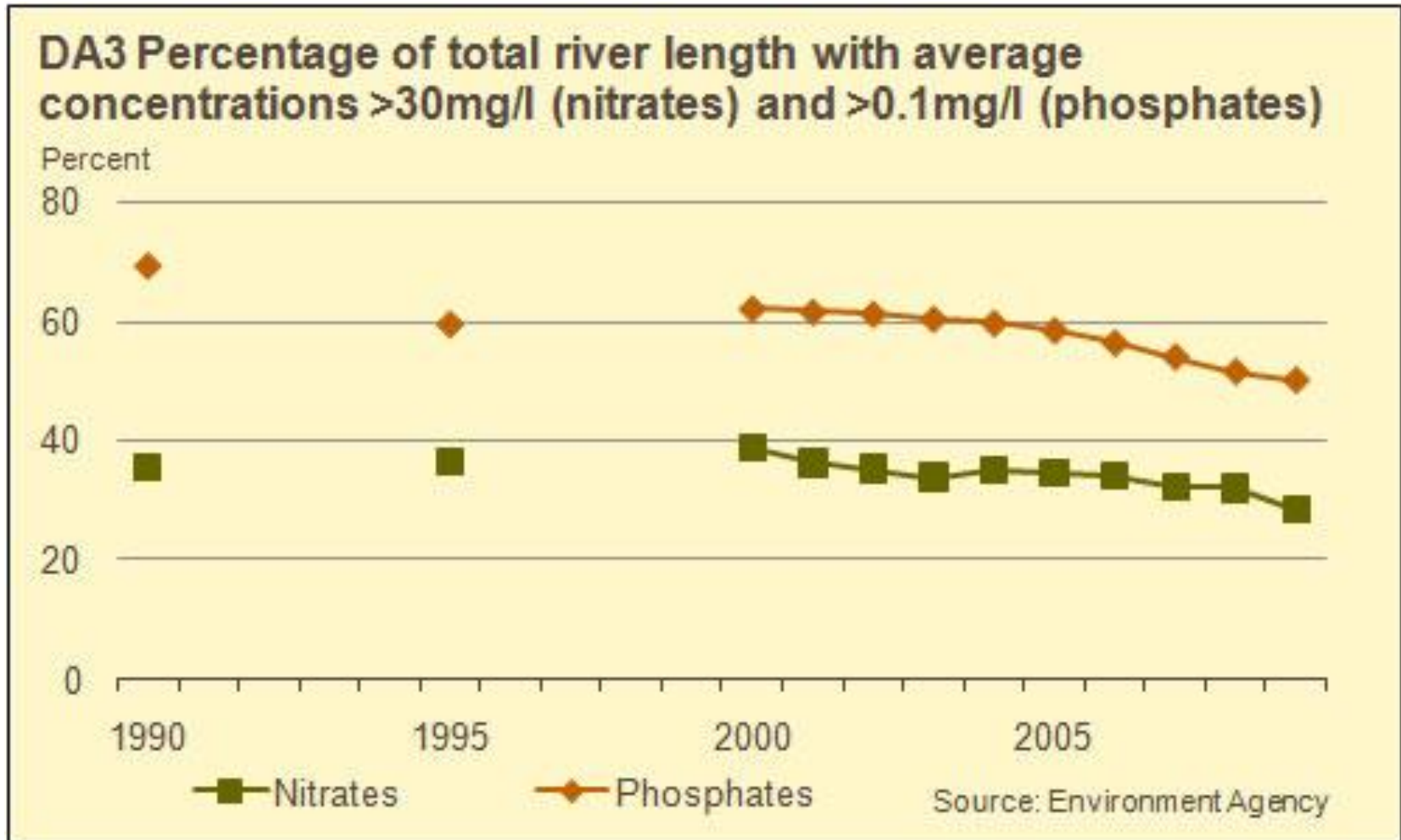
- **Nutrient (fertiliser and manure) management**
  - Amount + application method + timing
- **Manure storage**
  - Cover slurry stores or use manure in Anaerobic Digestion to reduce emissions
- **Livestock management**
  - Match nutrition to needs; healthy animals
- **Carbon Sequestration**
  - Protect soils (especially carbon rich peaty soils)
- **Plant, animal breeding**

N and P from agriculture in UK:

- 59% nitrates
- 26% phosphates

Nitrates Directive (91/676/EEC)

Water Framework Directive (2000/60/EC )



- **Cross compliance ((EC) No 73/2009)**
- The SPR 2010 asks farmers to:
  - identify and record current and potential problems with their soil;
  - assess and record soil types and degradation risks on their land;
  - select and take appropriate measures to prevent and/or remediate any problems and risks;
  - review these risks and measures each year and reconsider as appropriate.

www.defra.gov.uk

## Soil Protection Review 2010



rpa  
rural payments agency

defra  
Department for Environment  
Food and Rural Affairs

## Single Payment Scheme

Cross Compliance  
Guidance for Soil Management  
2010 edition



rpa  
rural payments agency

defra  
Department for Environment  
Food and Rural Affairs

- **Soil Protection Review 2010**
- Farmers must assess soil conditions in each field, identify and record risks to soil and take and record preventative measures – at a one off cost of *ca.*£1.8m
- Where damage to soil occurs (e.g. through accessing waterlogged soil to complete harvesting), the damage and remedial action taken must be recorded on the SPR.

www.defra.gov.uk

## Soil Protection Review 2010



rpa  
rural payments agency

defra  
Department for Environment  
Food and Rural Affairs

## Single Payment Scheme

Cross Compliance  
Guidance for Soil Management  
2010 edition



rpa  
rural payments agency

defra  
Department for Environment  
Food and Rural Affairs

- ## Soil Framework Directive

- Draft EU Soil Framework Directive introduced by EC in 2006
  - Proposal in EU Thematic Strategy on Soil Protection.
  - Seeks to harmonise and raise the level of soil protection across the EU.

The approach currently proposed would require Member States to:

- take action on soil degradation threats (erosion, loss of soil organic matter, salinisation, landslides, acidification and compaction);
- identify and remediate contaminated land;
- take preventive and precautionary measures to protect soil functions;
- take into account the impact of policies on soil degradation processes;
- contain soil sealing.

# Organic materials to land

- Sewage sludge
- Composts
- Anaerobic digestates

- The EC Sewage Sludge Directive (86/278/EEC) regulates the use of sludge to agricultural land.
- This is transposed through the Sludge (Use in Agriculture) Regulations 1989 (amended 1990), and is supported by the 'Code of practice for Agricultural Use of Sewage Sludge' and the ADAS 'Safe Sludge Matrix'.
- The European Commission are currently assessing whether the Directive should be reviewed.



- Coalition government committed to increasing energy derived from waste through anaerobic digestion (AD).
- Create renewable energy, reduce greenhouse gas emissions and avoid waste being sent to landfill.
- There is a need to increase awareness of the value of the products and confidence that they can be used safely within agricultural systems.
  - Anaerobic Digestate Quality Protocol; BSI PAS 110

## Directive 91/414/EEC

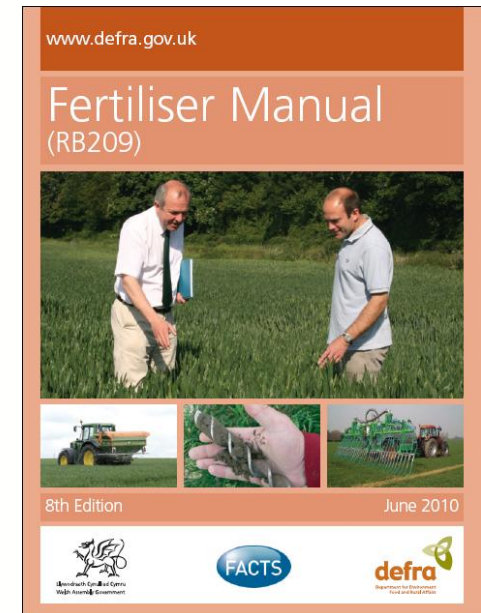
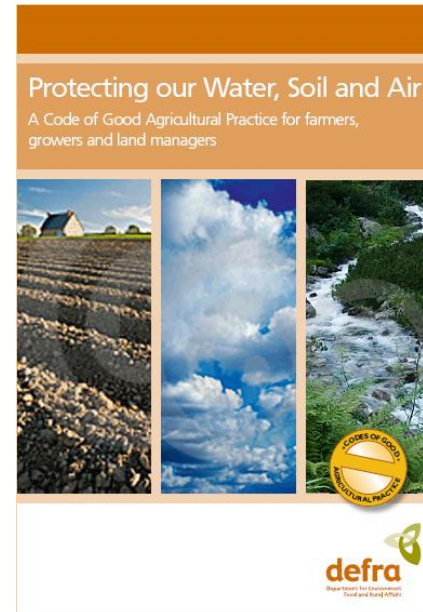
- This legislation harmonised plant protection product regulation across EU
- Active substances approved at EU level
- Products and uses approved at Member State level
- Review programme reduced number of active substances approved across EU from >1000 to around 300

- Under the EU Thematic Strategy on Pesticides two key pieces of European legislation governing the system for pesticides will apply from 2011; a Regulation on Pesticide Authorisations (**PPP Regulation**) that is largely an updating of the existing European regime, and a Directive on the Sustainable Use of Pesticides (**SUD**) that will establish a framework to promote best practice in the storage, use and disposal of pesticides. The PPP Regulation takes effect from June 2011; the SUD must be transposed by November 2011.

- Reviews of
  - EC 2003/2003 Fertiliser Regulations
  - UK 1991 Fertiliser Regulations

# Example Defra initiatives

- Guidance
  - CoGAP
  - New Fertiliser Manual (RB209) released
  - Software tools – PLANET 3.0, MANNER, ALLOWANCE
- Science R&D funding
  - £100m+ p.a.



**PLANET**  
NUTRIENT MANAGEMENT



## Recent projects include:

- AC0114-118 GHG platform
- WQ0118 Cracking clays
- WQ0207-214 Demonstration Test Catchments
- IF01110 N requirements in variety trials
- AC0409 Implementation of anaerobic digestion in E&W

- Environmental stewardship schemes
- Campaign for the Farmed Environment
- England Catchment Sensitive Farming  
Delivery Initiative

- Many diverse pressures and drivers affecting agriculture in UK – complex landscape
- Holistic approach needed to tackle multiple issues
- Many regulations mentioned currently or soon to undergo review/revision
- Now a good time to engage with Defra in these areas - KT
- Farmers are land managers – they don't just produce food, and don't just produce one product, they are key custodians and providers of ecosystem services and environmental benefits for wider society.



# Drivers affecting soil management and agronomy

A Defra perspective

## Questions?

Contact:  
[Murray.Hart@defra.gsi.gov.uk](mailto:Murray.Hart@defra.gsi.gov.uk)