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Science into Action – How do we get the messages across?

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Why do we need to get the message across?

- Maximise production efficiency and farm income
- Minimise pollution
- Comply with regulations
- Help farmers and policy makers do the right thing
- Make the world a better place

Knowledge exchange

Managing organic material applications is difficult

Ammonia gas

Nitrous oxide gas

Nitrogen gas

Volatilisation

Plant uptake

Organic N

Ammonium N

Denitrification

Soil Organic N

Nitrification

Immobilisation

Nitrate

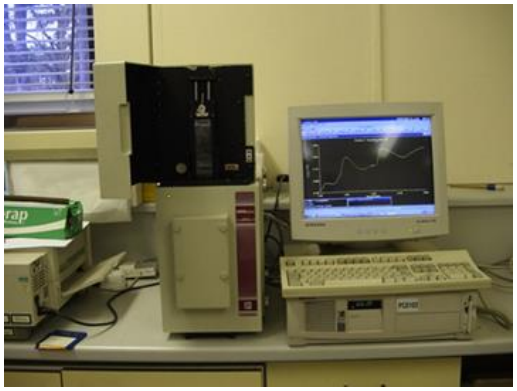
To water (NO_3-N, NH_4-N, P, FIOs etc).

What do we need to think about?

- Crop requirements
- Soil nutrient supply
- Manure nutrient content
- Storage
- Spreading
- Nutrient losses
- Mineralisation of organic nutrients
- Concerns
  - Microbial pathogens,
  - Metals, POPs etc.
  - Physical contaminants
- Farm enterprise

Manure nutrient content

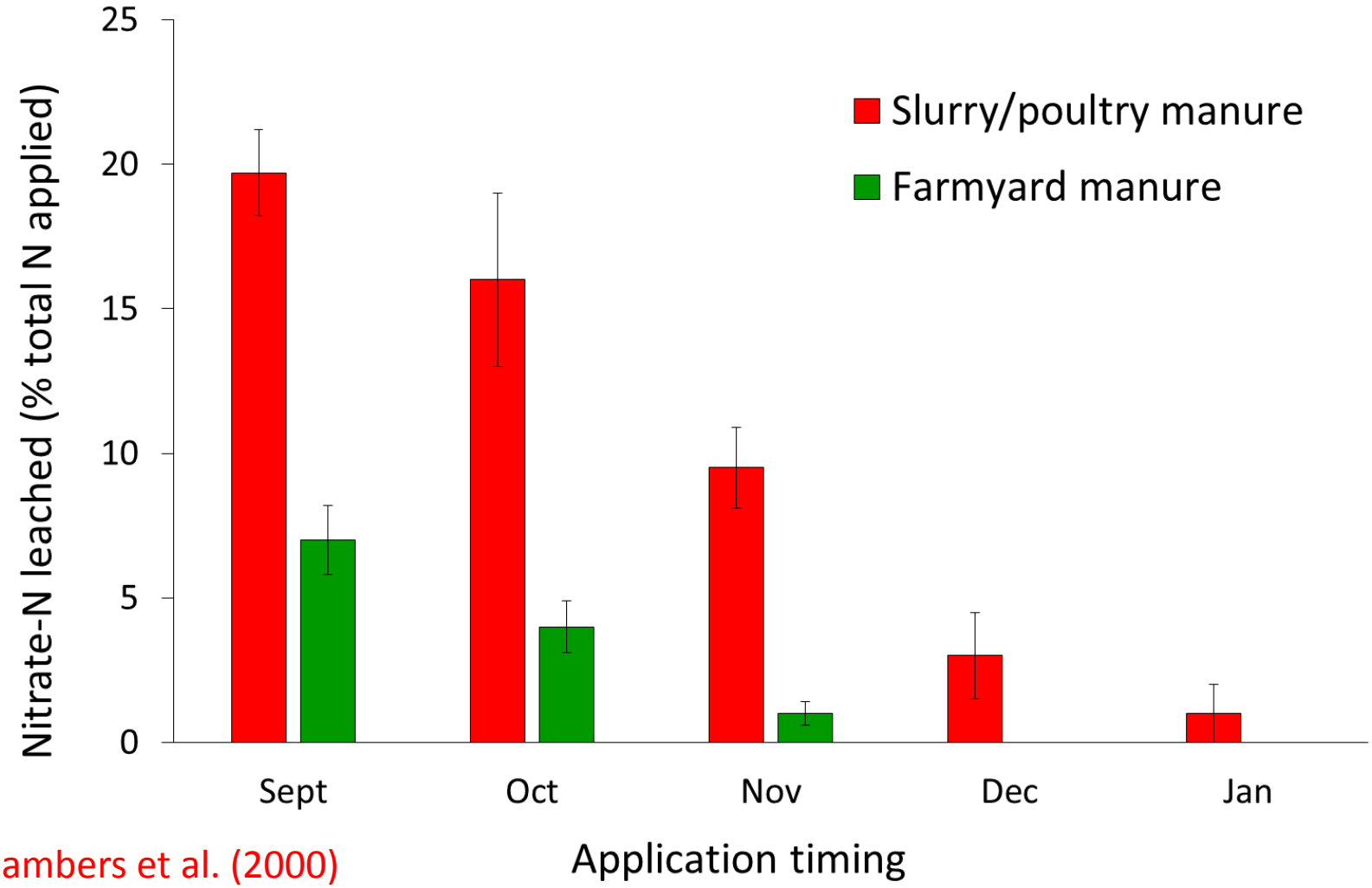
- ‘Typical’ figures
  - N, P, K, Mg, S
- Laboratory analysis
  - DM, total N, NH_4-N, total P, K, Mg & S
  - Take a representative sample
- New techniques, e.g. NIRS analysis
- On farm slurry analysis
  - Slurry N meters (Agros, Quantofix)
  - Slurry hydrometer (dry matter)



Application rates

- Quantity spread, pattern and area
- Slurries
  - Tanker volume/rate
  - Flow meters
- Solid manures
  - Weigh trailer full & empty
  - Use estimated densities
  - Weigh cells

Take account of application timing



Chambers et al. (2000)

Take account of application method

Ammonia emission reductions compared with surface broadcasting:

- Trailing hose 30%
- Trailing shoe 60%
- Shallow injection 70%

(Misselbrook *et al.*, 2002; Smith *et al.*, 2000; Bittman *et al.*, 2014)

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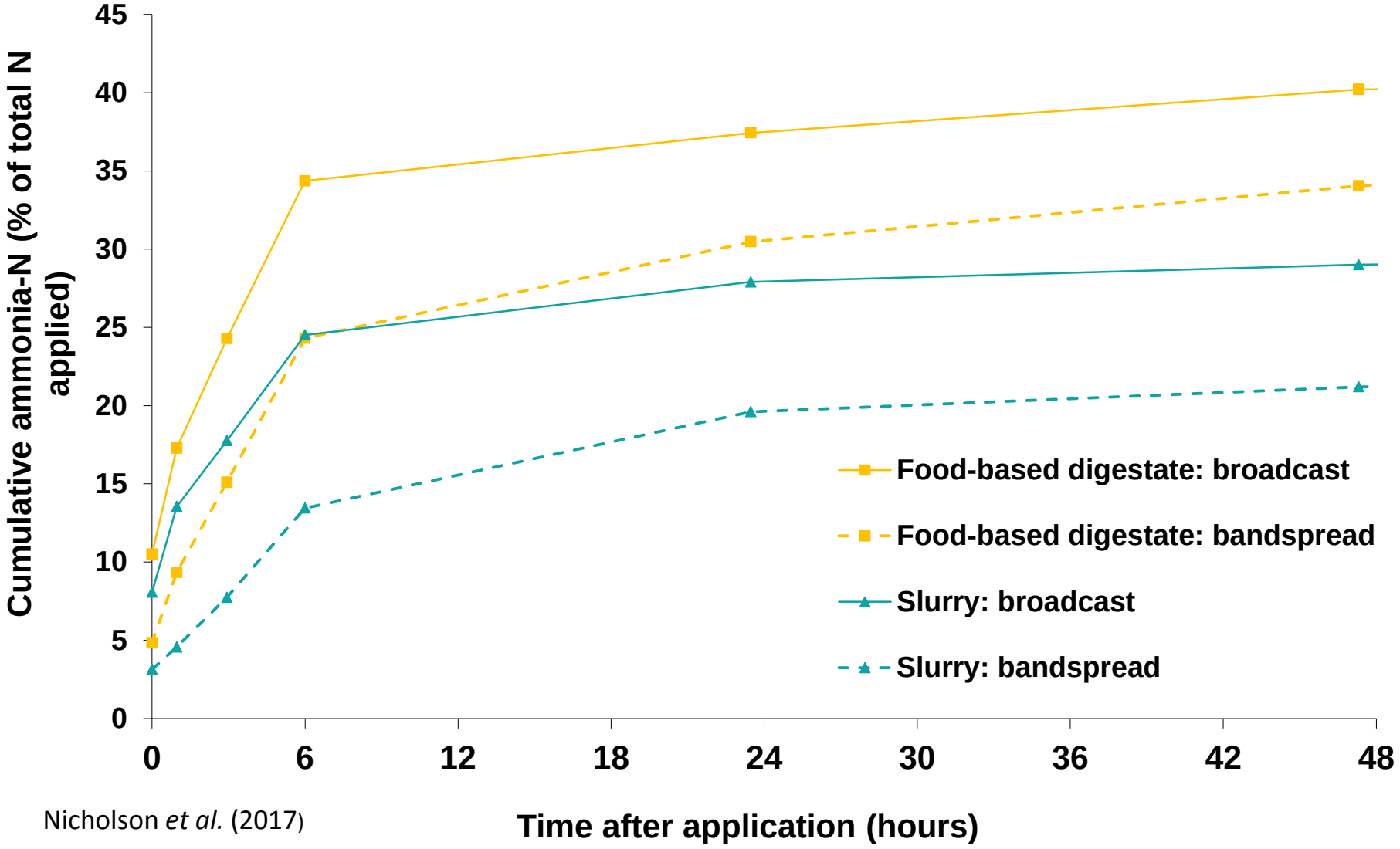
Take account of delay between application and soil incorporation



Nicholson *et al.* (2017)

Stakeholder confidence

- EU regulations set standards for production and product quality:
  - Fertiliser Regulations
  - Sludge Directive
  - End of Waste
  - Environmental Permitting
- Research based recommendations

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Good quality decision support tools are available but……..

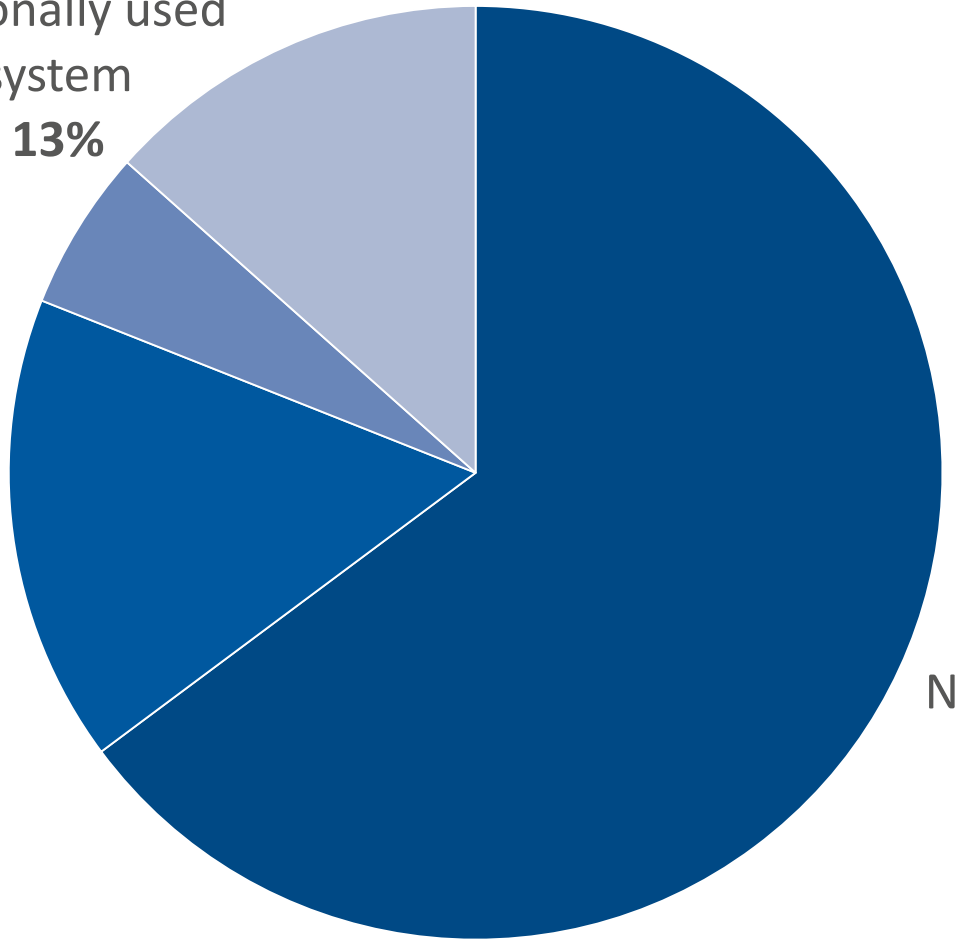
Just because we are talking doesn't mean that anyone is listening…….

Current projects:

- FAIRWAY: Evaluation of decision support tools for water quality

- SlurryMax: investigating communication methods with livestock farmers

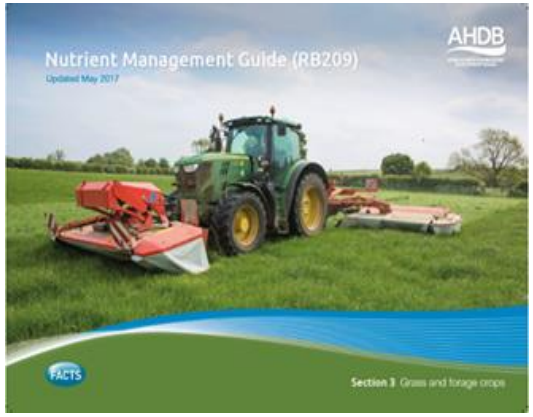
Do UK grassland farmers use recommendation systems?



Newell-Price et al (2016)

Factors affecting uptake of decision support tools (Rose *et al.*, 2016)

- Performance
- Ease of use
- Peer recommendation
- Trust
- Cost
- Relevance
- Farm adviser use
- 14% of farmers in England do not have access to a computer.....(Defa; FPS)



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The role of the adviser

- Trusted source of advice
- Key role in transferring complex science into practical messages
- 60% of farmers prefer a visit compared to any other form of communication*
- Training and professional development essential:
    - FACTS
    - BASIS
    - Feed Advisers Register (AIC)

*NE Land management Survey (2013)

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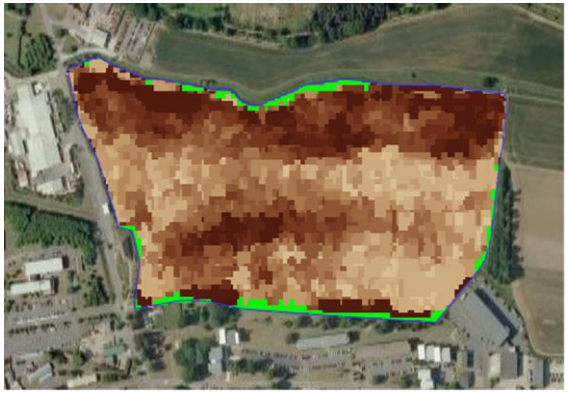
Getting the message across – Catchment Sensitive Farming

- Established in 2006; covering 79 catchments across England
- Catchment Sensitive Farming Officers work in partnership with farmers, NGOs and other stake holders
- Deliver key messages to farmers to change practice to improve water quality and farm profitability
- Long-term relationships covering complete production systems
- Government funded.

Challenges for the future

- Funding
  - R&D and extension services
  - Government v. industry
- Consistency of message
  - Independent and impartial
- Developing technologies and changes to farming practice
- Succession planning
  - Scientists
  - Practitioners with varied skill sets



Science into action

- Knowledge based on robust science
- Clear and consistent messages
- A range of formats
- Know your audience
- Practical/economic impacts
- One size doesn't fit all!

YouTube

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Thank you for listening

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