

# Low emission slurry application technology: a research, advisory and farmer perspective

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# Presentation Outline

## Knowledge Exchange to Encourage Adoption of Low Emission Slurry Application Technology Northern Ireland:

- Actors involved
- Background to the work
- Cafre knowledge exchange processes
- Knowledge exchange actions
- Outcomes from the work



# Actors Involved

- Agri-Food & Biosciences Institute (AFBI) – slurry research
- Agrisearch – research funding
- College of Agriculture, Food and Rural Enterprise (CAFRE) – knowledge exchange demonstrations and training
- Ulster Farmers Union (UFU) – member encouragement
- Department of Agriculture, Environment and Rural Affairs (DAERA) Policy – capital grant funding

# Background

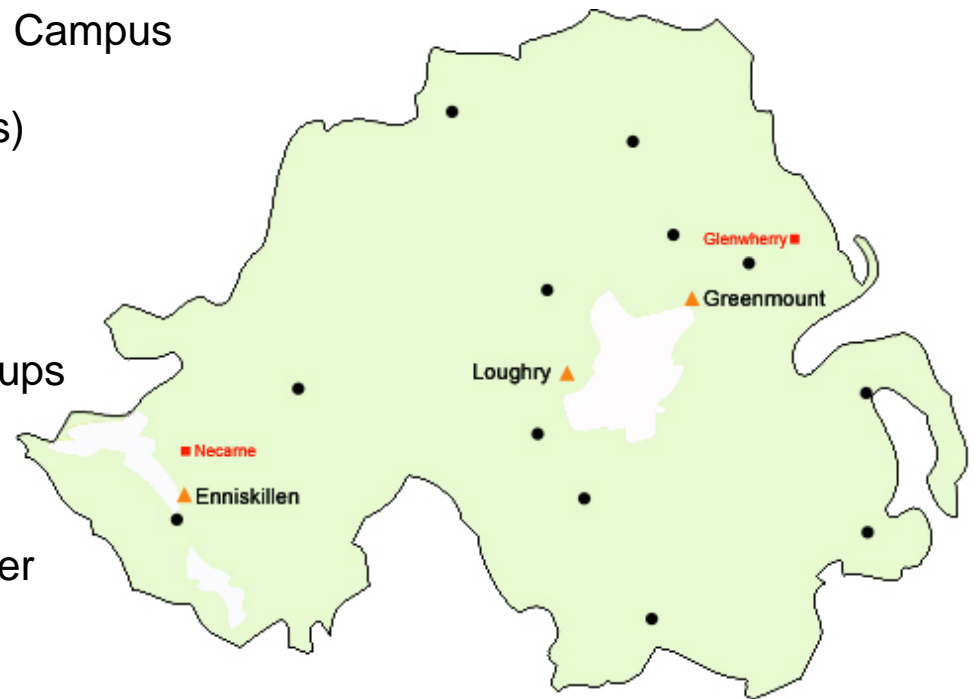
- AFBI Research - Trailing Shoe slurry application (Dr P Frost)
- Nitrates Directive negotiations
  - Slurry nitrogen (N) use efficiency
- Slurry N efficiency - EU Commission paper (Dr J Bailey 2005)
- Nitrates Directive Action Plan measures and DAERA initiatives
  - Closed period
  - Slurry storage capacity
  - Improved slurry spreading technology (target 33% cattle & pig slurry)
  - Technology demonstration and training (CAFRE)
  - METS (Manure Efficiency Technology Scheme)

- Education Service

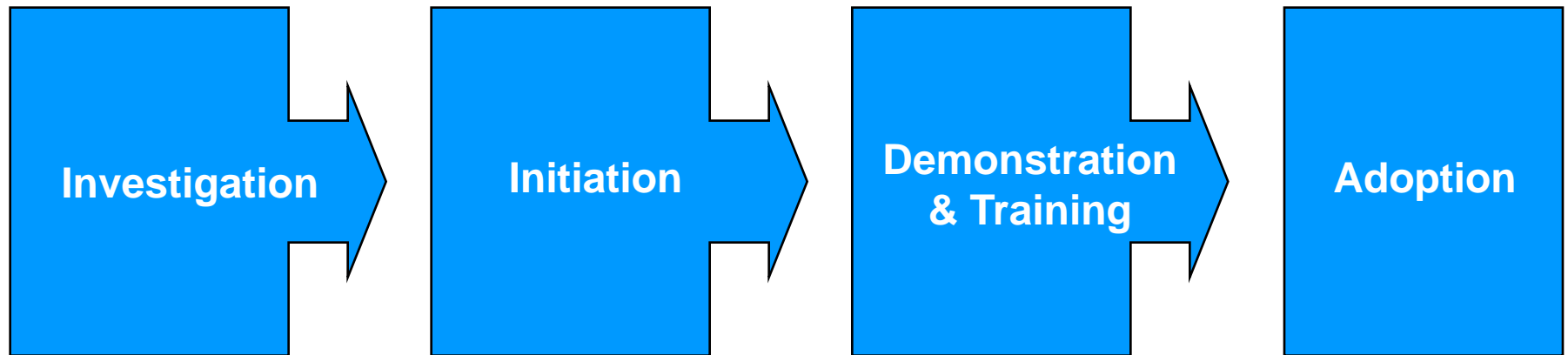
- Agriculture, Horticulture, Veterinary Nursing (Greenmount Campus)
- Food Technology (Loughry) Campus
- Equine (Enniskillen Campus)

- Development Service

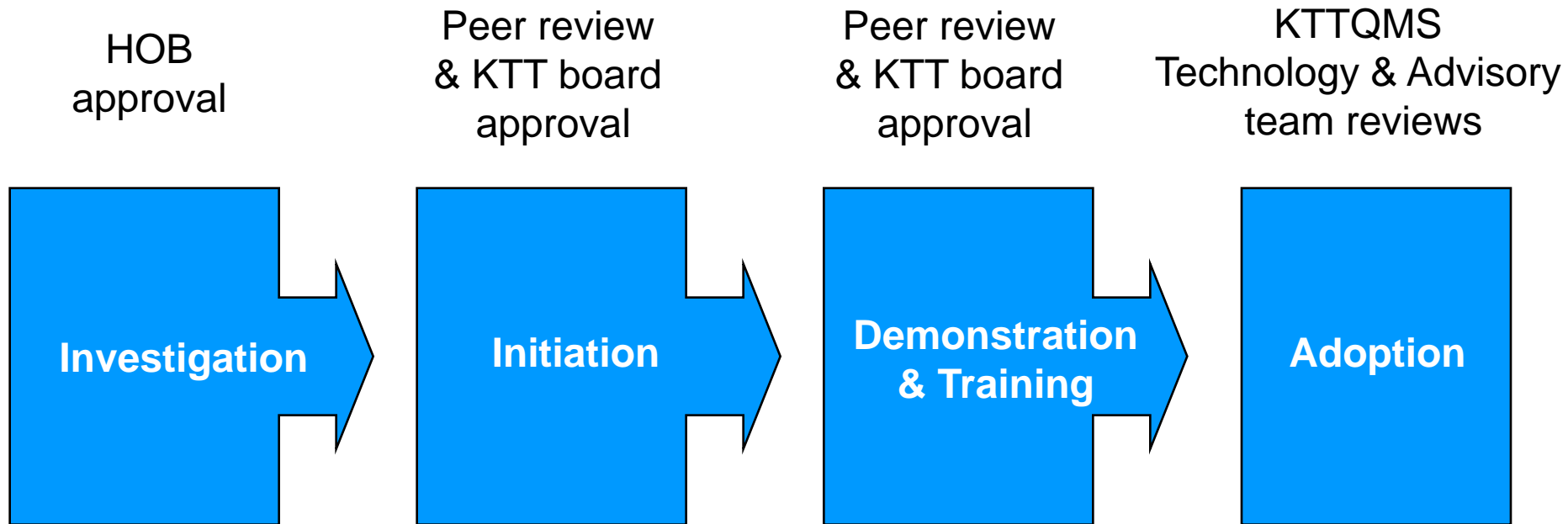
- Business Development Groups
- Benchmarking
- Training/Technology Transfer
- Technology Adoption



# The CAFRE Knowledge Exchange Process



# The CAFRE Knowledge Exchange Process



# Knowledge Exchange Demonstrations

- DARD/UFU – Greenmount Campus 2004
- AFBI/CAFRE – Hillsborough 2006 (500+ farmers attended)
- Local farm events 2007-2010 (30+ events)





# Slurry Application Technology

- Ploughing in
- Deep injection
- Shallow injection
- Trailing shoe
- Band spreading
- Splash plate



# Benefits of Low Emission Slurry Application Technology

## **AFBI Hillsborough Research – Quantifiable Benefits: Traditional Splash Plate vs Trailing Shoe/Band Spreading (results from 23 harvests over 3 years)**

<b>Application method</b>	<b>Trailing shoe</b>	<b>Band spreading</b>
*Available N utilisation change (%)	25	10
*Grass yield change (%)	26	18
**Reduced P runoff (%)	27 to 37	

*\*Frost (2007) Occasional publication No. 38, British Grassland Society*

*\*\*McConnell (2012) Journal of Environmental Quality*

# Fertiliser Savings

Slurry Application System	Splash Plate	Trailing Shoe
Application rate (m <sup>3</sup> /ha gal/acre)	50 (4500)	50 (4500)
Available N from slurry (kg N/ha)	30	57
N from bagged fertiliser (kg N/ha)	70	43
Total N available (kg N/ha)	100	100
*Savings in fertiliser cost (£/ha)	-	£30 (£12/acre)

*\*Calcium Ammonium Nitrate (27% N) @ £300/tonne*

# Cost Benefit Analysis

## Trailing Shoe vs Splash Plate:

- 25% increase in contractor spreading costs
- 10% reduction in work-rate (P Frost, AFBI)
- £10 per hectare saving over extra spreading costs
- Farm scale to justify? - 300 dairy cows (without grant aid)



# Benefits of Low Emission Slurry Application Technology

## **Non-Quantifiable Benefits:**

- Higher application rates to silage areas
- More even application & less grass contamination
- Wider spreading window - up to 4 weeks after cutting
- Spreading within 3.0m of watercourse rather than 10.0m
- Reduced odour







# Knowledge Transfer

## Farmer concerns relayed to AFBI



- Rowing up of residual slurry trash
- Grass dieback along slurry line
- Impact on soil worm content
- Impact of multiple applications each season

# METS

## Manure Efficiency Technology Scheme



College of Agriculture,  
Food & Rural Enterprise

- Competitive scheme
- Key criterion: volume spread/financial benefit
- Farmer co-operation encouraged (Group applications)
- Online application system
- Industry briefings:
  - UFU/NIAPA
  - Banks
  - Farmer seminars
- Post-grant aid CAFRE training





# METS

## Manure Efficiency Technology Scheme



College of Agriculture,  
Food & Rural Enterprise

- Farmers grant aided: 307 items of slurry equipment
- Funding provided: £2.9M
- Online application: 96%
- Estimated slurry volume spread by alternative means – 33%\*



*\*Survey of slurry spreading practices in N. Ireland, AFBI, 2013*

# Research & Knowledge Exchange in Action

