Automating the dairy farmer? Understanding the barriers to uptake and use of precision technology in dairy systems

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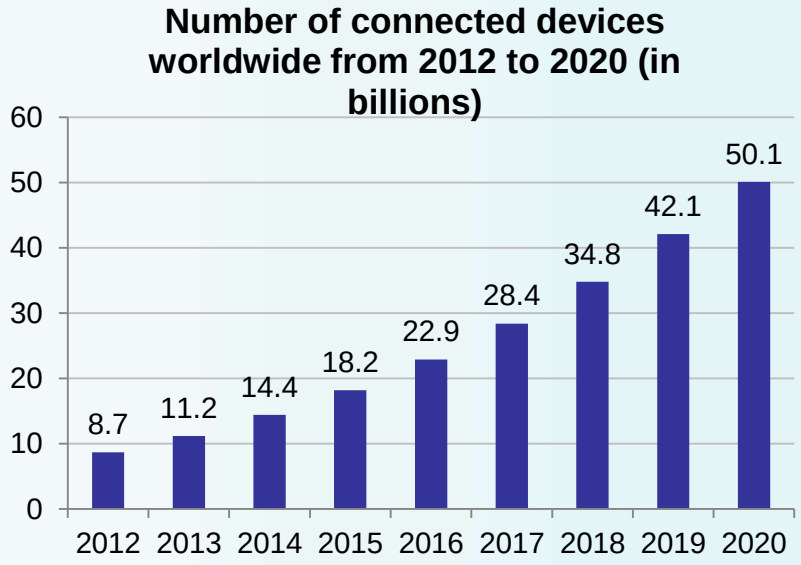
Speaker: Debbie McConnell

Automating the dairy farmer: understanding the barriers to uptake and use of precision technology in dairy systems

Dr Debbie McConnell

Precision technology – a changing world

- Emergence of a data-sharing world
- Agriculture provides a perfect host for precision technologies
- Ability to drive sustainability in dairy production systems:
- Feeding
- Nutrients
- Labour
- Technology adoption rates remain relatively low in dairy systems



Source: CISCO, 2016

Study aim

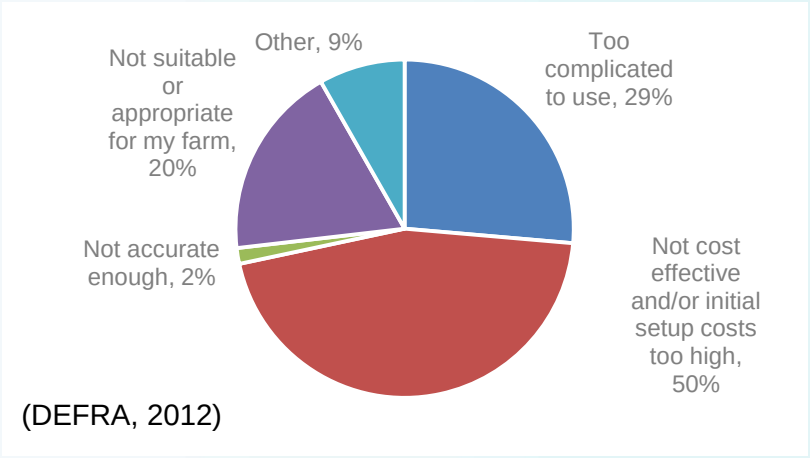
How can we make the most out of precision technology in the dairy sector?

- Factors limiting uptake of precision technology?
- Why people were investing?
- How were they ensuring they were getting the most out of the technology?

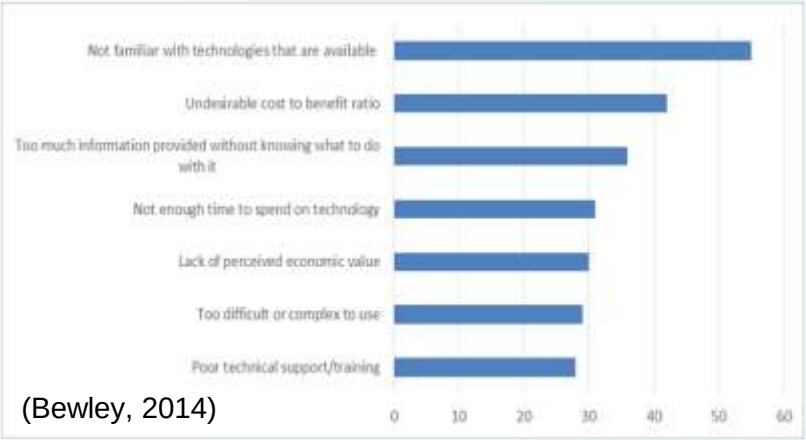
- >70 interviews with:
  - Industry
  - Technology manufacturers
  - Farmers
  - Researchers

Factors limiting adoption?

- Limited evidence base on cost-benefit of technology
- Lack of resource
  - Financial
  - Time



(DEFRA, 2012)

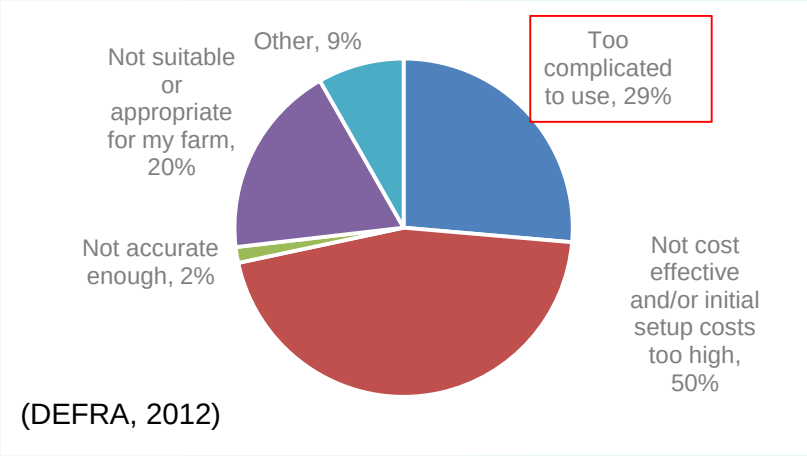


(Bewley, 2014)

Factors limiting adoption?

- Limited evidence base on cost-benefit of technology
- Lack of resource
  - Financial
  - Time
- Easy of use
  - Skillls base on farm
  - Off-farm support network

45% of UK dairy farmers felt that having better ICT skills was required to embrace use of technology(DEFRA, 2012)



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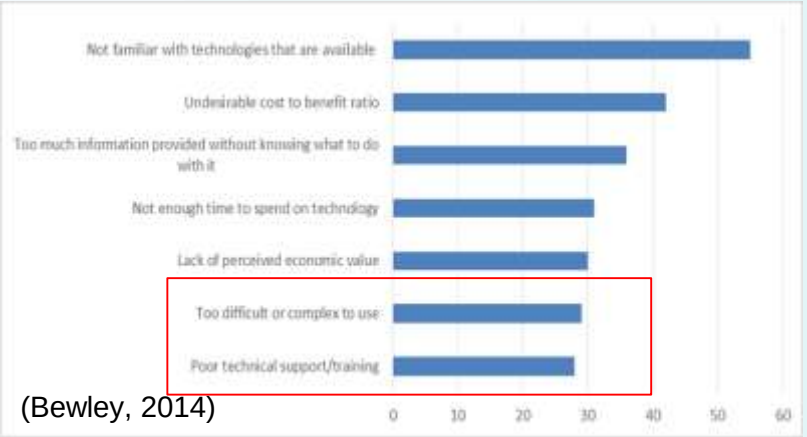
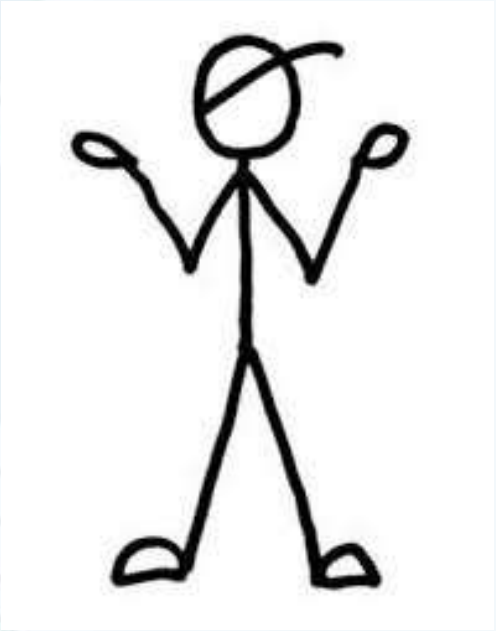


(Bewley, 2014)

Why were people investing?

- Curious
- Wanted to be ahead of the game/ new challenge
- Labour saving/Quality of life
- Better management of business



What did they look like?

- Younger (with older generation providing strategic/financial support)
- Achieved higher level education
- Multiple business enterprises – spread financial risk

How was technology performing on farm?

I'm not sure, I think it's a better system, it's got much more data and it cost a lot of money!

My herd fertility is good now but I'm not sure what it was like before

I am not sure what the best metrics are to measure against, I look at what the sales person told me

Long-term, yes we'd consider more robots but we want to get this working correctly first

Measure to Manage?

Investing in technology brings greater measurement, not necessarily better management

Adaption process

Phases of the learning trajectory of new precision dairy farmers (adapted from Eastwood et al.2012)

3 - 6 months	6 – 12 months	12 months +
Early learning	**Consolidation phase**	**Advanced learning**
Basic data entry, creating simple groups, descriptive and responsive activity	**Task repetition leading to knowledge consolidation, building data interpretation skills**	**Combining different data to give more effective decision support processes, tailored to specific needs, additive benefit to farm** **Opportunity for true cost-benefit assessment**

Adaption process

Phases of the learning trajectory of new precision dairy farmers (adapted from Eastwood et al.2012)

3 - 6 months	6 – 12 months	Lack of:	12 months +
Early learning	**Consolidation phase**	**Data skills**	**Advanced learning**
Basic data entry, creating simple groups, descriptive and responsive activity	Task repetition leading to knowledge consolidation, building data interpretation skills	**Strategic Guidance**	Combining different data to give more effective decision support processes, tailored to specific needs, additive benefit to farm Opportunity for true cost-benefit assessment

Building the skills base

- Recognising the skill set required on farm is changing – data management and interpretation a key requirement (££)
- Making precision agriculture more accessible at an earlier age

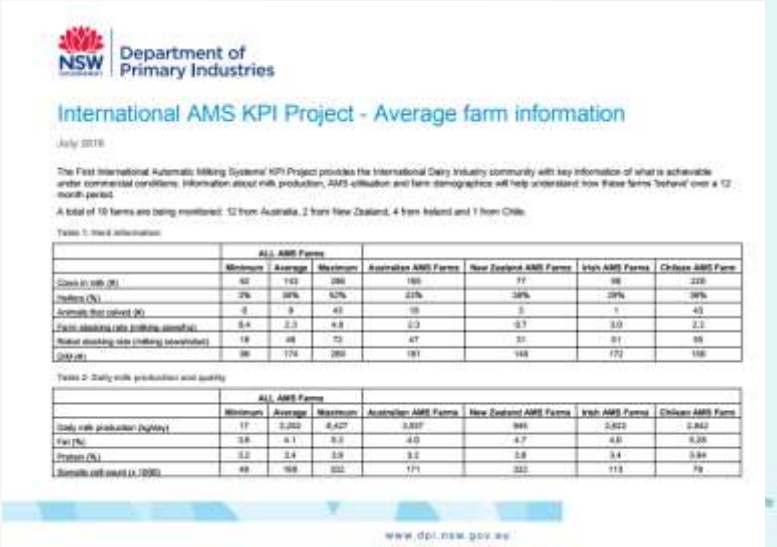
Providing strategic guidance

- Nick and Rebecca Dornauf, Gala Dairies, Tasmania
- Voluntary access, 4-way grazing system
- Started in 2010
- 600 cows (400 spring, 200 autumn)
- 8000kg milk/cow/year

Providing strategic guidance

“We felt quite alone, we didn’t know if what we were doing was right or how we compared to other robot farms”

- Need for clear KPIs when implementing precision technology
- Greater sharing of data across technology



Using technology to drive grassland production and utilisation

- Grassland agriculture will be pivotal to ensuring sustainable N.I. dairy, beef and sheep industries
  - Significant volatility in price and availability of imported feedstuffs
  - Environmental and social concerns

Significant financial benefit to improving grass growth and utilisation

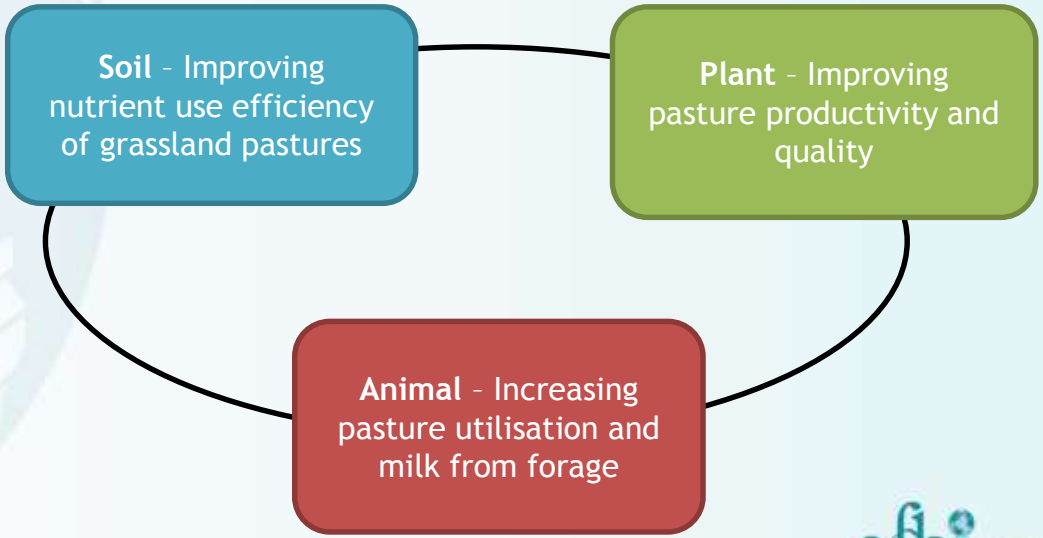
+£441/ha

+£204/ha

(Mayne and Bailey, 2016)

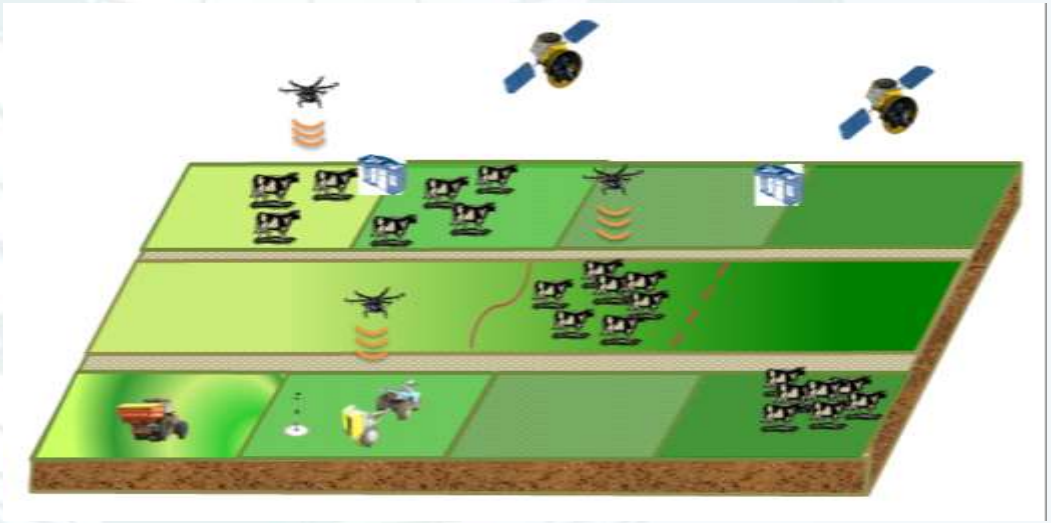
Changing our understanding of the grazing environment: AFBI Precision Grassland Platform

- High-tech research platform which enables the collection of detailed information on soil, plant and animals



Changing our understanding of the grazing environment: AFBI Precision Grassland Platform

- Supported by network of farmer co-researchers providing on-farm test bed for new technologies but also key group for sharing experiences and developing KPIs



Summary

- Need to move from **technology centric view** to **user centric view** of precision agriculture
- Technology allows us to measure but not necessarily manage. Need to address skills gap on farm and offer appropriate industry support.
- Further integration required between research and technology developers to build appropriate KPI's for technology
- Significant scope to drive grassland production and utilisation with precision technology but farmer engagement key