

# Hitachi Social Innovation Forum 2017

———— BRISBANE ————

---

**HITACHI**  
Inspire the Next

## **Ian Layden**

Leader, Horticultural Systems  
(Innovation)

**Department of Agriculture and  
Fisheries**

# Topic: Technology in Agricultural Systems: the Cultivation and Perfection of Human Beings

Ian in his role at the Queensland Department of Agriculture and Fisheries he has undertaken a range of horticultural field trials responding to nitrogen loss in intensive horticulture, and was responsible the first surface flow treatment wetlands for rural applications on banana and cane farms in North QLD. In 2015 he constructed the first of what is now 20 denitrification bioreactors in Queensland.

Ian currently leads a national RD&E project that is optimising a range of precision technologies for the vegetable industry

Ian is currently completing his commercial UAV certification sits on the National Committee of the Society for Precision Agriculture Australia (SPAA).



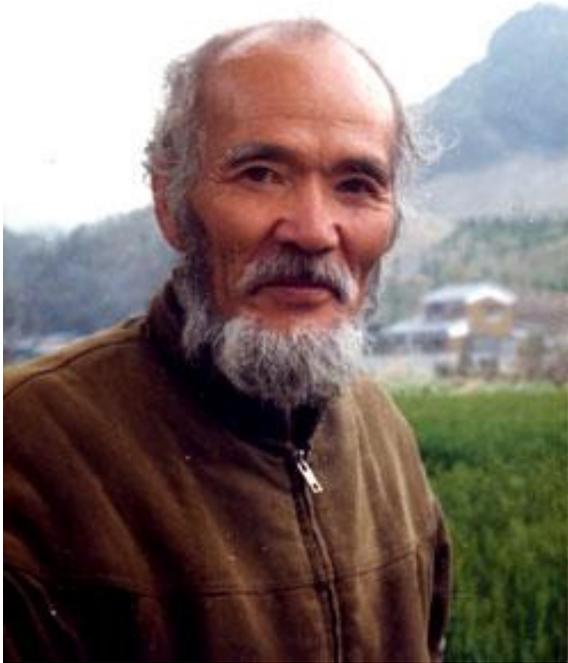
**Ian Layden**  
Leader, Horticultural  
Systems (Innovation)  
*Department of Agriculture  
and Fisheries*

# Technology in agricultural systems



Ian Layden  
Leader Horticultural Systems (Innovation)  
Department of Agriculture and Fisheries





*“...the ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings”*

Masanobu Fukuoka (1913 –2008) Agriculturist, farmer, philosopher

# Some adoption theory

- Adoption is based on subjective perceptions or expectations rather than on objective truth
- Adoption is a learning process with 2 distinct aspects:
  - collection, integration and evaluation of new information
  - skills to apply the innovation to their own situation

Source: Pannell *et al.* Understanding and promoting adoption of conservation practices by rural landholders. *Australian Journal of Experimental Agriculture*, 2006, 46, 1407–1424

# Typical adoption sequence

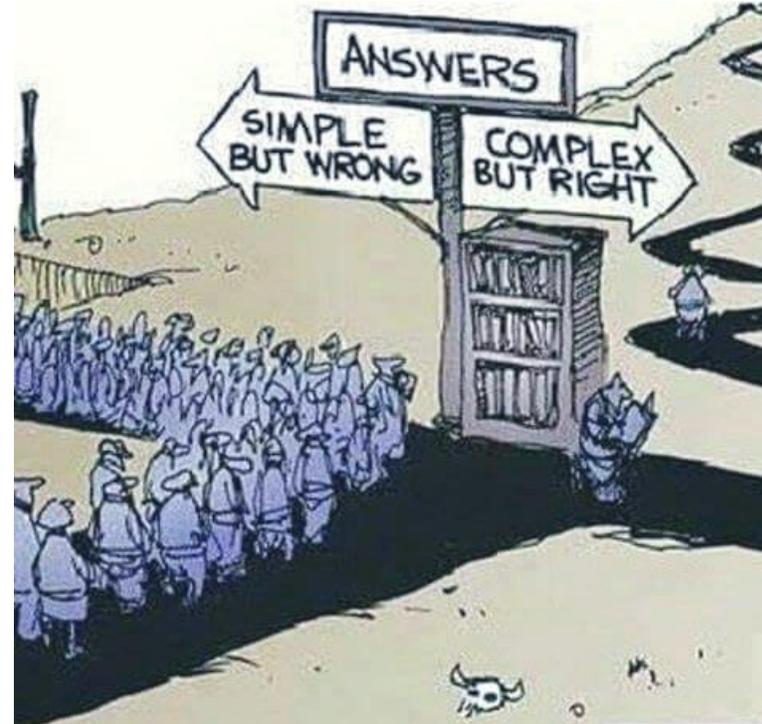
- Awareness
- Non-trial evaluation
- Trial evaluation
- Adoption
- Review and modification
- Non-adoption or dis-adoption

A mixture of scientific information, personal experience, and cultural influences.

Source: Pannell *et al.* Understanding and promoting adoption of conservation practices by rural landholders. *Australian Journal of Experimental Agriculture*, 2006, 46, 1407–1424

# Complexity of the innovation

A critical determinant of a farmer's ability to make an innovation work is their own **management skill**.



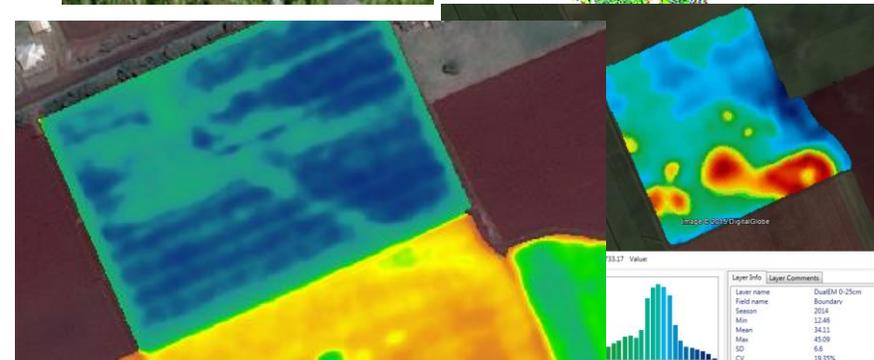
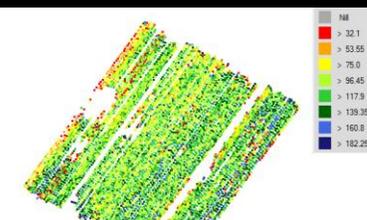
Source: Pannell *et al.* Understanding and promoting adoption of conservation practices by rural landholders. *Australian Journal of Experimental Agriculture*, 2006, 46, 1407–1424



*"If you dig deep enough, most questions end with uncertainty"* Prof. Brian Cox



data is worthless without the insight and skill that interprets it





# Bayer and Bosch will unveil how they will replace the agronomist and the weed seeker at Agritechnica



Sharon O'Keefe  
@agronomy\_sharon

15 Sep 2017, 3 p.m.

Machinery



## Mach



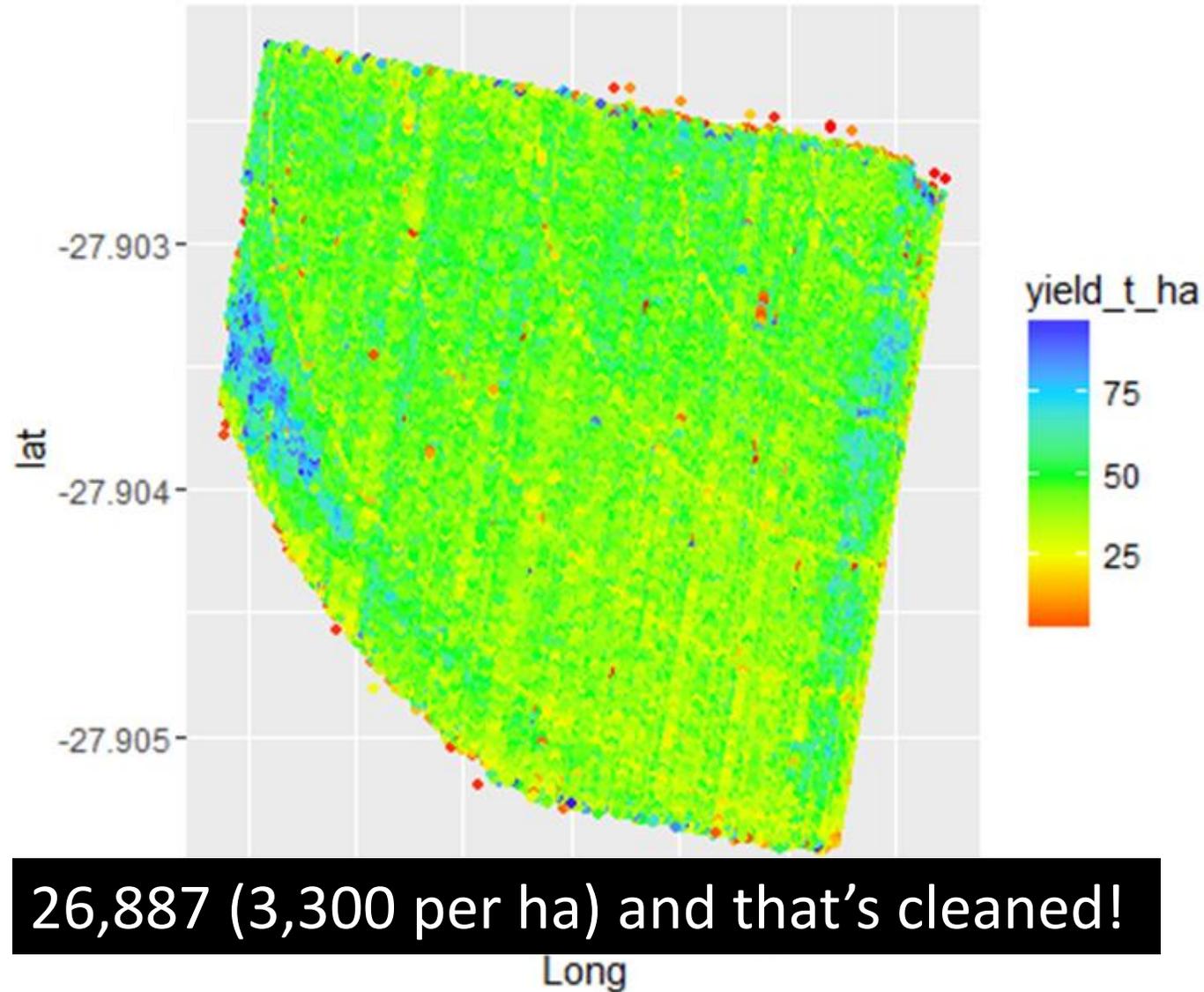
No need  
agrono  
ago

# So what are waiting for? Show me the \$\$...

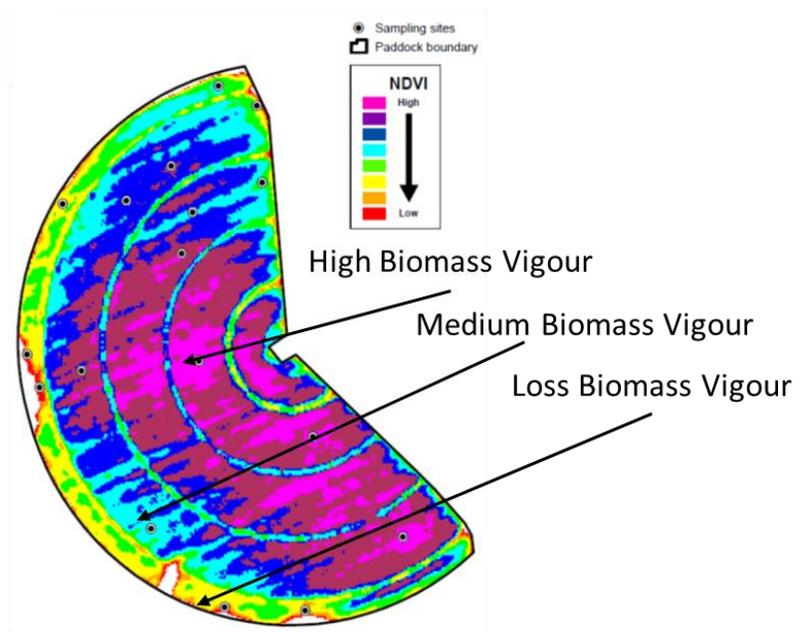
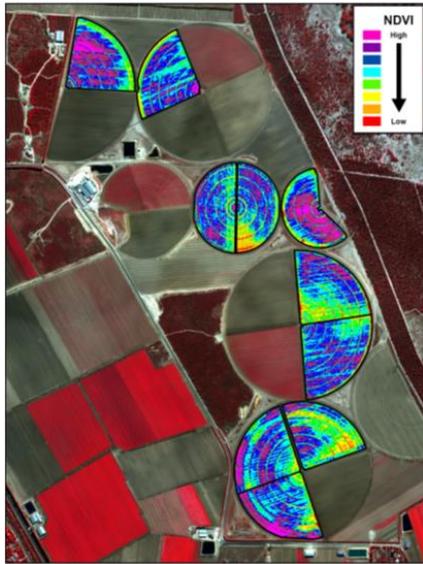
- Multiple rotations – 4,6,8,10 per year
- Varietals
- Right timing
- Climate drivers
- Connectivity
- Data post processing
- Data management
- Agronomy
- Customer demands



# How many data points in 8ha?



26,887 (3,300 per ha) and that's cleaned!



# The ~~challenge~~ in ag opportunity

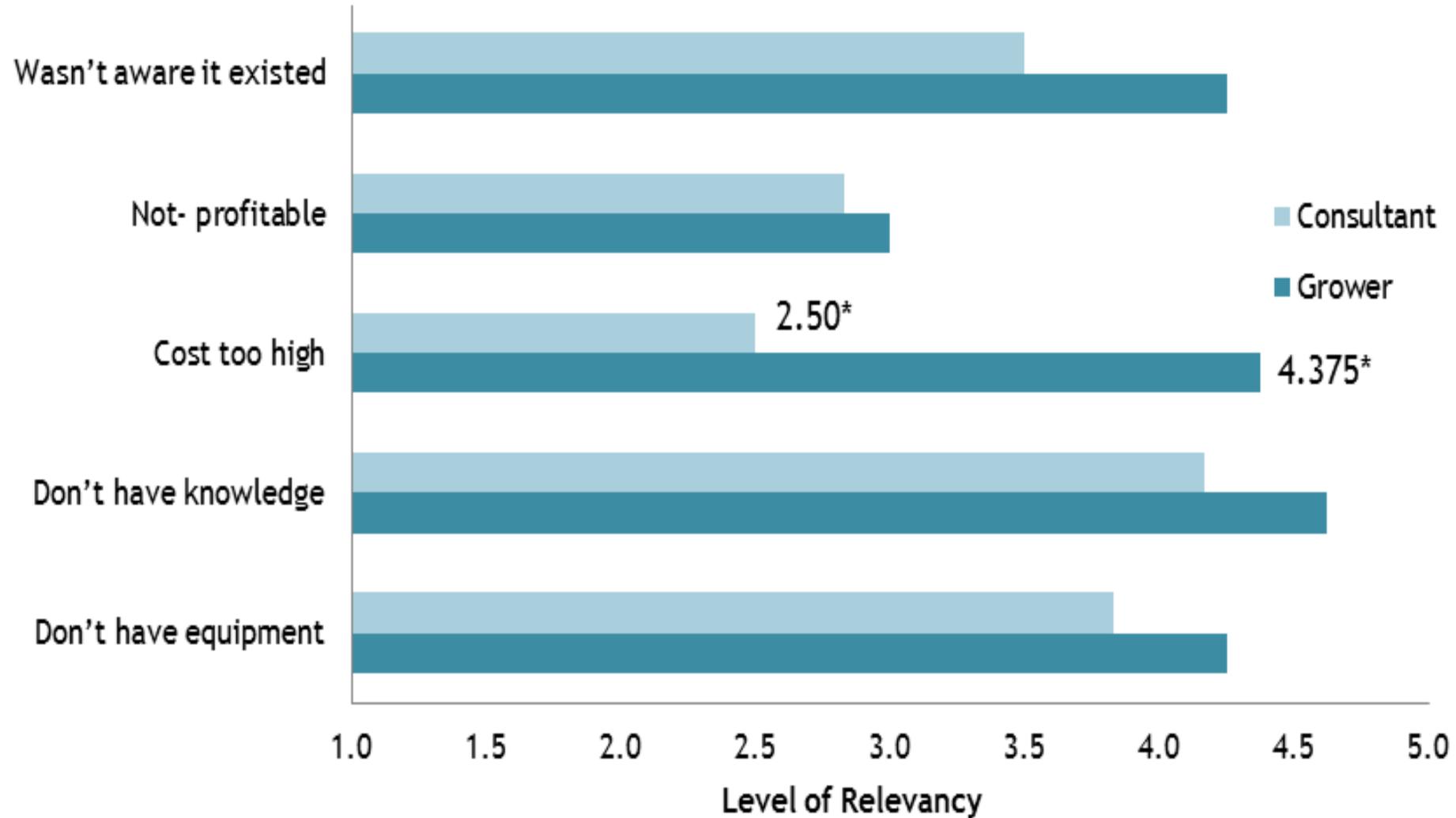
- Volume, timing, connectivity, platform
- Storage/curation
- Integration
- Interpretation
- Management action needed



# What are we hearing...

- *“...opened my eyes to (the) variability that’s there – soil, irrigation system – raises more questions”*
- *“...able to learn what we want to do with the technology, as opposed to “selling the idea”*
- *“Believe in technology enough – to start own project and looking at what we can do”*

# What are we hearing...the barriers



Source: Best, T. (2016) A study of grower and consultant perceptions of precision methods and project impact. DAF Publication

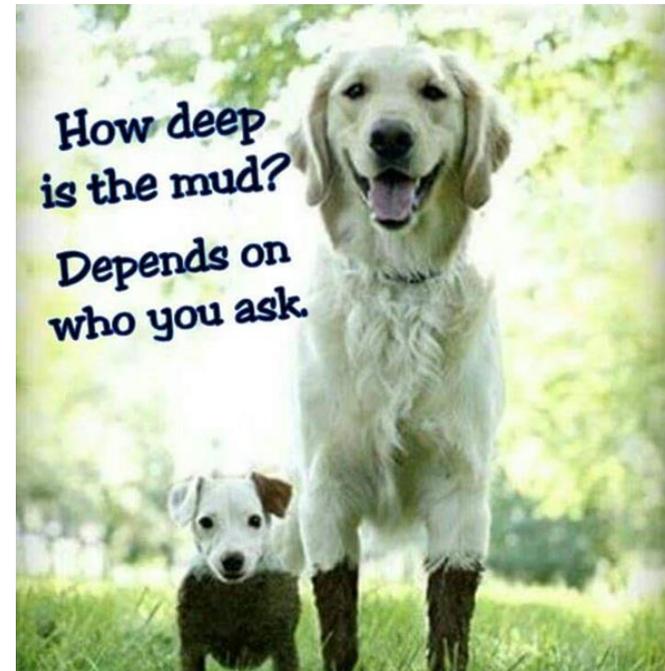
# What are we hearing...the barriers

- *“...time and effort required to implement precision methods”*
- *“...its going to take education and knowledge”*

Source: Best, T. (2016) A study of grower and consultant perceptions of precision methods and project impact. DAF Publication

# Summary

- Adoption processes important
- Are we adding complexity?
- Agronomy/ farming systems are important



Thank You