



**Experiences of collaboration from the
industry and research-student perspectives**

**James Moldon, Frontier Agriculture Ltd.
Dr Iain Dummett, PhD at Cranfield University**

6/11/18

IAgrE Conference 2018

Collaboration With Academia

Frontier Agriculture Ltd

James Moldon
Head of Technical Services

The Journey



2001

- 3% market share
- 210 employees
- £220m revenue



ALLIED GRAIN



2005

- 17% market share
- 585 employees
- £875m revenue



2018

- 23% market share
- 1025 employees
- £1.5byn revenue

Frontier: Activities

frontier



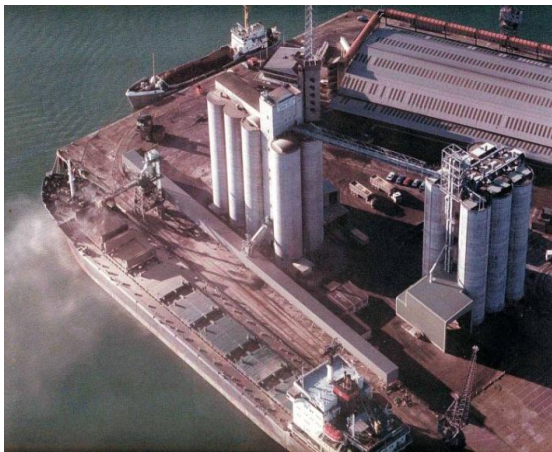
Grain marketing
23% of UK Wheat



Grain logistics
600 'fixings' per day



Grain storage
1,000,000 mt of grain storage



Grain exports
34% of UK Exports



Seed processing
25% of UK Seed



Crop nutrition
21% of UK fertiliser Fert

Frontier: Activities

Farm gate Experts



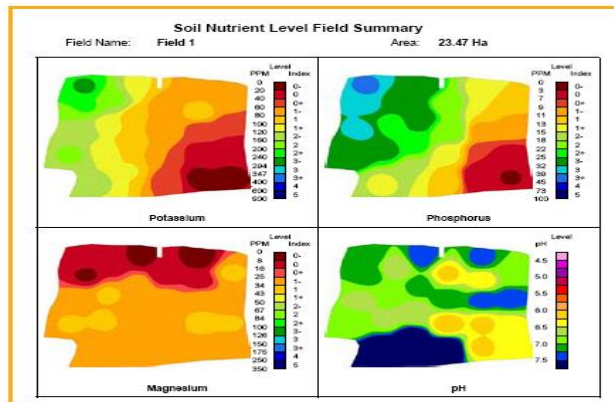
140 agronomists, 80 traders

Agronomy Trials



14000 plots, 22 sites

Precision Farming



1.3m acres of Precision

Biodiversity



No 1 supplier of conservation mixes

Innovation

➤ Frontiers desire to be at the forefront of Innovation



➤ Challenge

- How to generate a return on investment?
- Need to be able to translate research at the farm gate
- Farmer requires a reason and a return



➤ Criteria

- Delivering our customer requirements
- Ability to demonstrate expertise on farm



Credible Research

- Research objective
- What are we trying to achieve?
- Why use a PhD student?
- What makes a good academic partner?



Delivery

- Knowledge Exchange
 - Advisors
 - Farmers



- External Messaging

- **Imperative that R&D is not suppressed**
-



A PhD student's perspective on collaborative research

Dr Iain Dummett

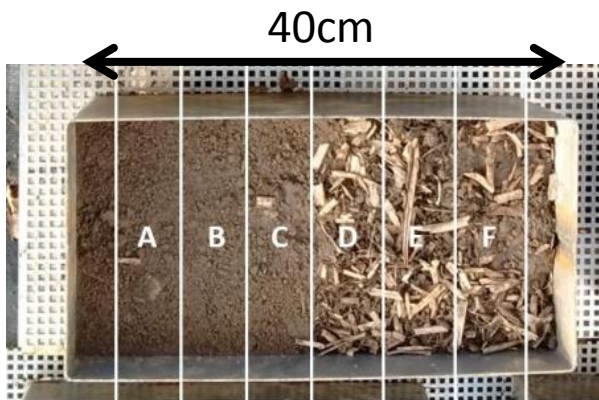
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The Douglas Bomford Trust



Generating value for multiple audiences

- In order for a collaborative PhD to be successful, it must generate value for all stakeholders, including the PhD student
- James has outlined how research can generate value for industry
- For the academic host institution, it's about publications and presentations
- The central challenge is to provide value to both audiences

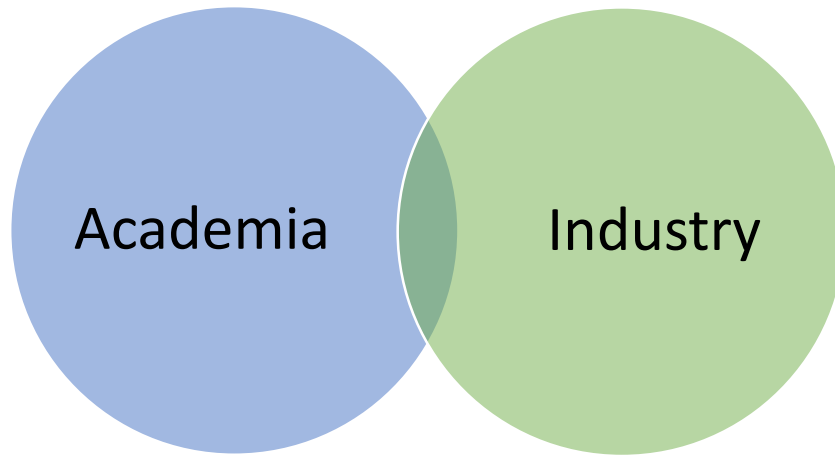


Lab scale

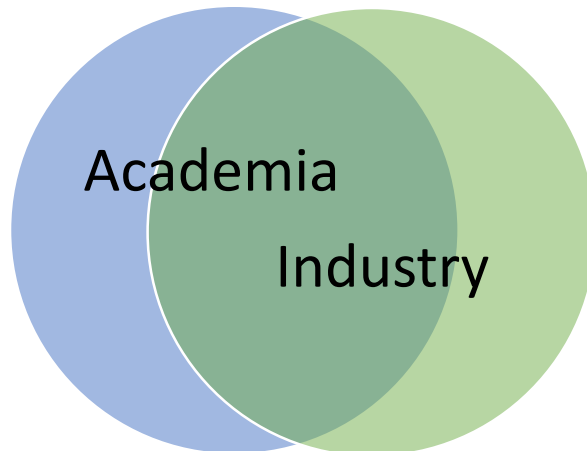


Field scale

Two models for collaboration



- Basic science under controlled conditions
- Field trials to evaluate practices for industry

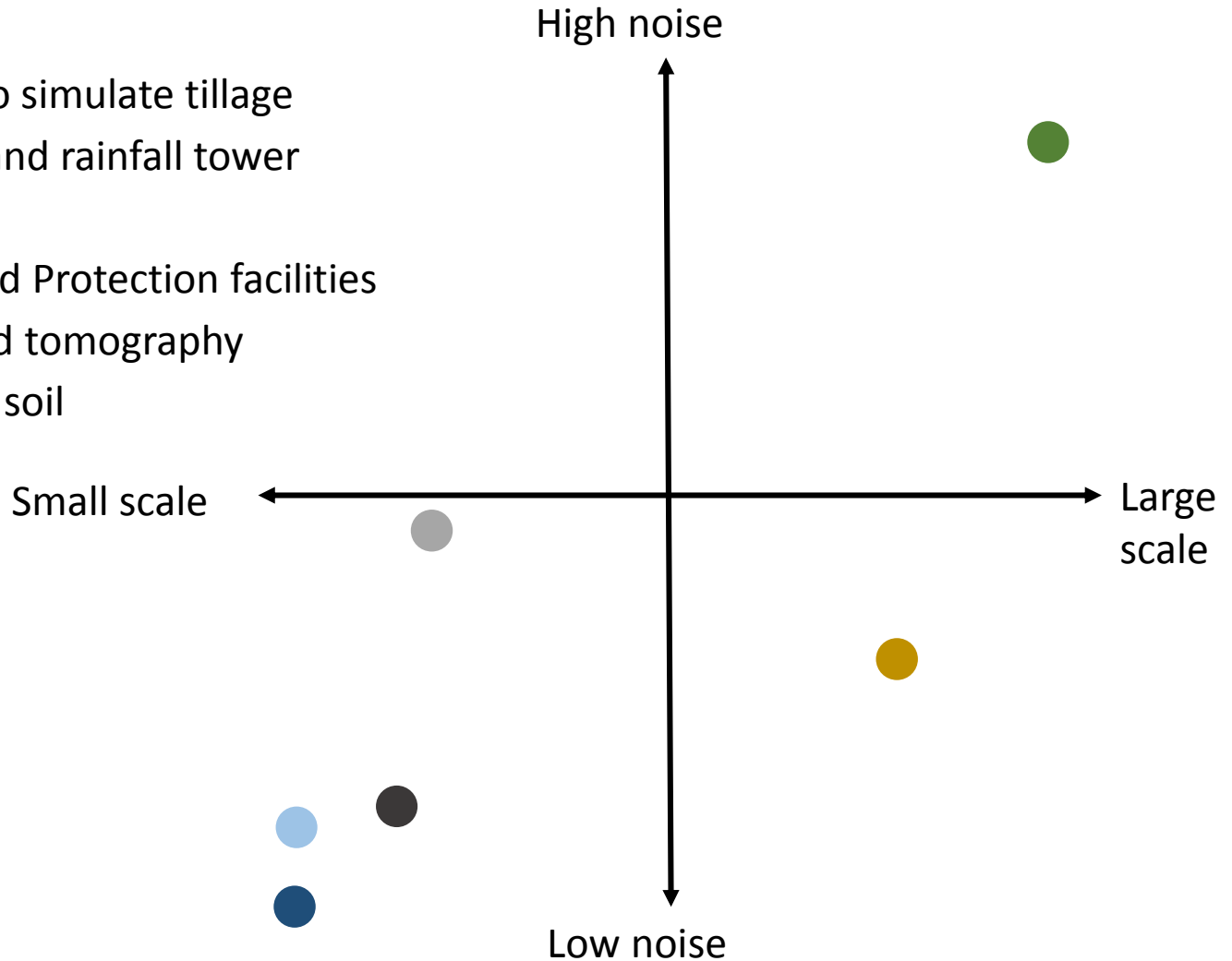


- Work in controlled environment at scale which is valued by industry
- Field trials to evaluate practices for industry



Research methodologies

- Soil Bin
- Using sieving to simulate tillage
- Field samples and rainfall tower
- Field trials
- Crop Health and Protection facilities
- X-ray computed tomography with repacked soil





Robust research

- Field trials are high risk and produce high-noise data
 - A random environment (weather, disease etc.)
 - A single mistake can ruin a year-long experiment

10 extreme weather facts from 2015

UK edition ▾

FW

The Guardian

Farmers fear for their crops after the driest April on record May 2017

BBC

Heatwave: 2018 was the joint hottest summer for UK

Library image © FLPA

🕒 3 September 2018

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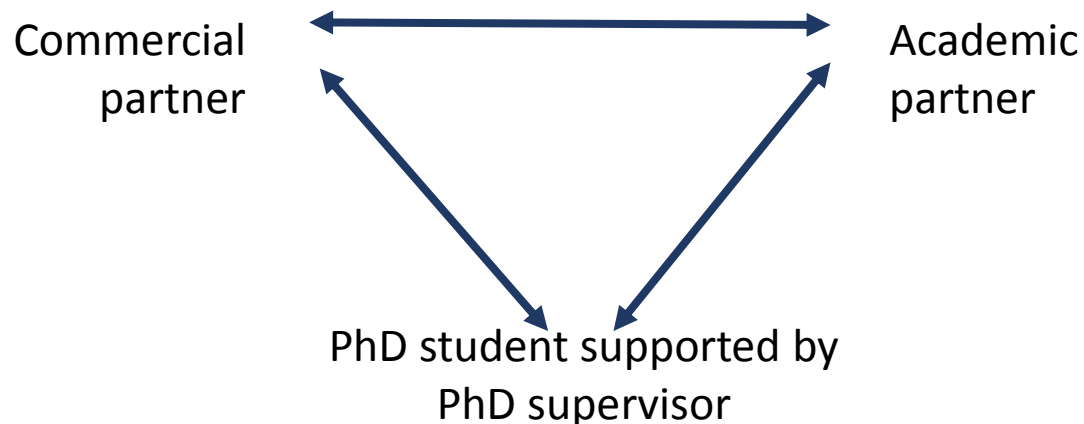
Robust research

- Field trials are high risk and produce high-noise data
 - A random environment (weather, disease etc.)
 - A single mistake can ruin a year-long experiment
- **Personally**, I think that every PhD with a field component should be planned assuming the field trial provides no, or very limited, academic outputs
 - This is not to say that the study would not be valuable for the industrial partner
- Designing a PhD which builds a chain of evidence from basic to applied science ensures research is robust



Tips for a rewarding experience as a PhD student

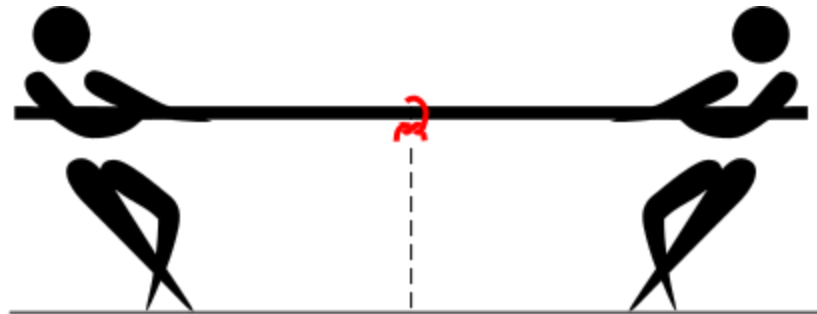
- **Communication is key**
 - Define the research question early on
- As a PhD student
 - Create a **single vision** for the project which includes all stakeholders
 - Be clear about the outputs of a piece of work before starting it
 - Be flexible
 - Take advantage of the expertise you are surrounded by



Opportunities and challenges

Challenges

- Researcher can be stretched thin working for two audiences



Opportunities

- Research has impact
- Pooling of complementary expertise
- Building understanding and relationships



Thank you

Any questions?

