What drives the farm factor
Session outline

Pete Berry, ADAS

Evidence for the Farm Factor

Philip Dolbear, AHDB

Characteristics of top performing farms

Views from the panel

Questions from audience via Slido

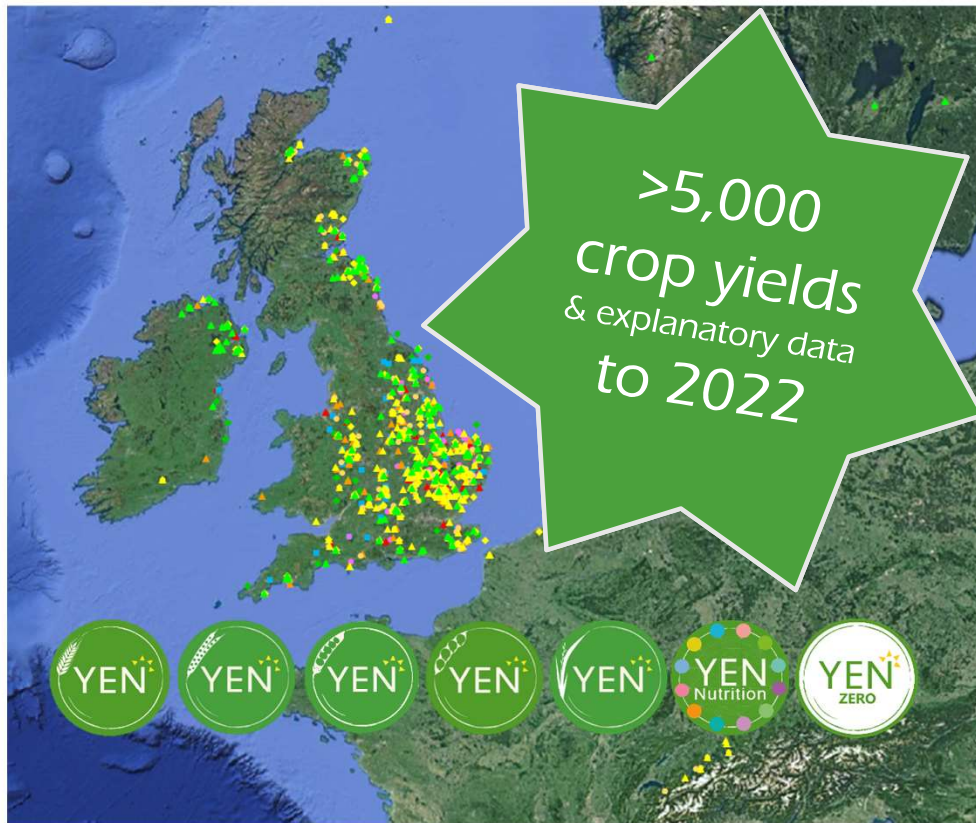# Evidence for the Farm Factor

Pete Berry - ADAS

Evidence for the Farm Factor: From the YEN database

>5,000 crop yields & explanatory data to 2022

Data collected:

- **Weather**
- **Soils**
  - Texture, depth, stoniness, SOM, pH etc...
- **Field & crop info**
  - Cultivations, variety, agronomic inputs...
- **Crop observations**
  - Photos, dates of key growth stages
- **Verified yields**
- **Grain sample**
  - Protein & specific wt
  - Full nutritional analysis
  - Grain size & shape distribution
- **Grab sample**
  - Yield components
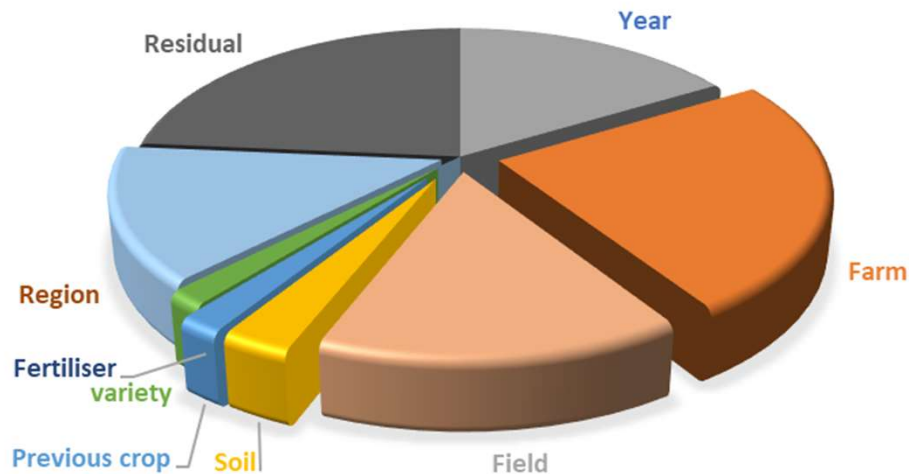 - Harvest Index, Biomass
  - N uptake

Statistical Analyses of YEN data 2013-2020

REML analysis – Restricted Maximum Likelihood

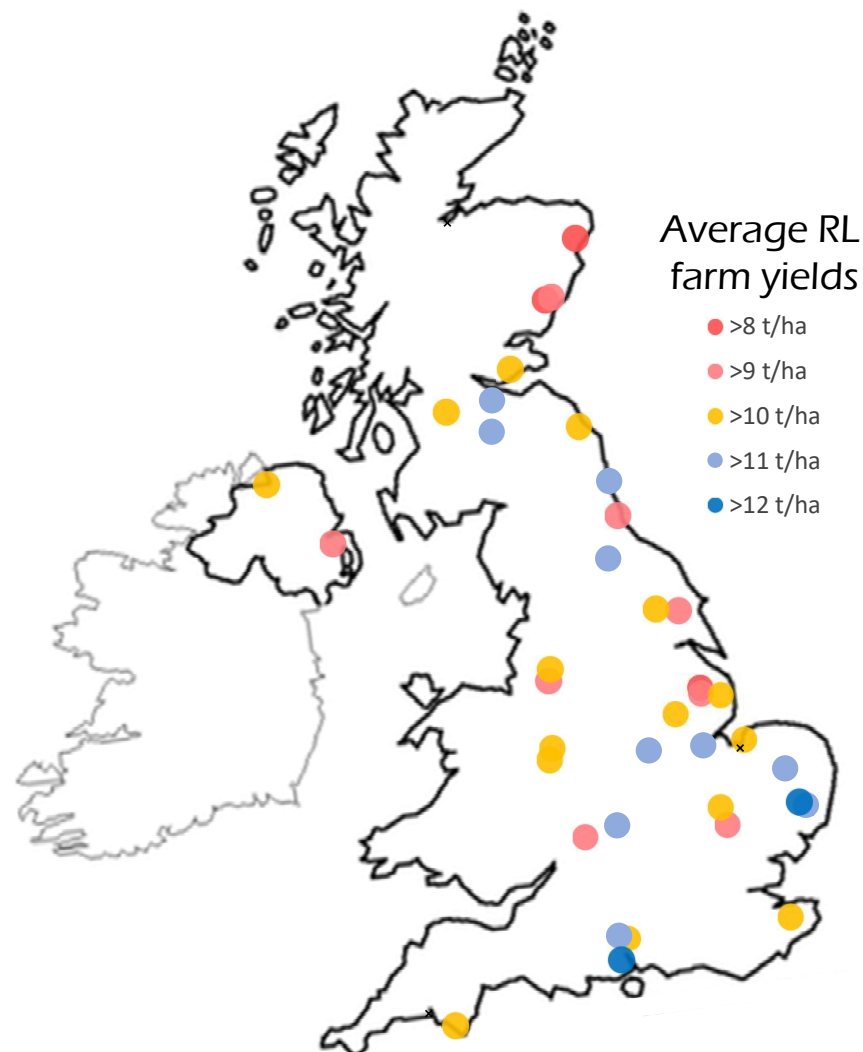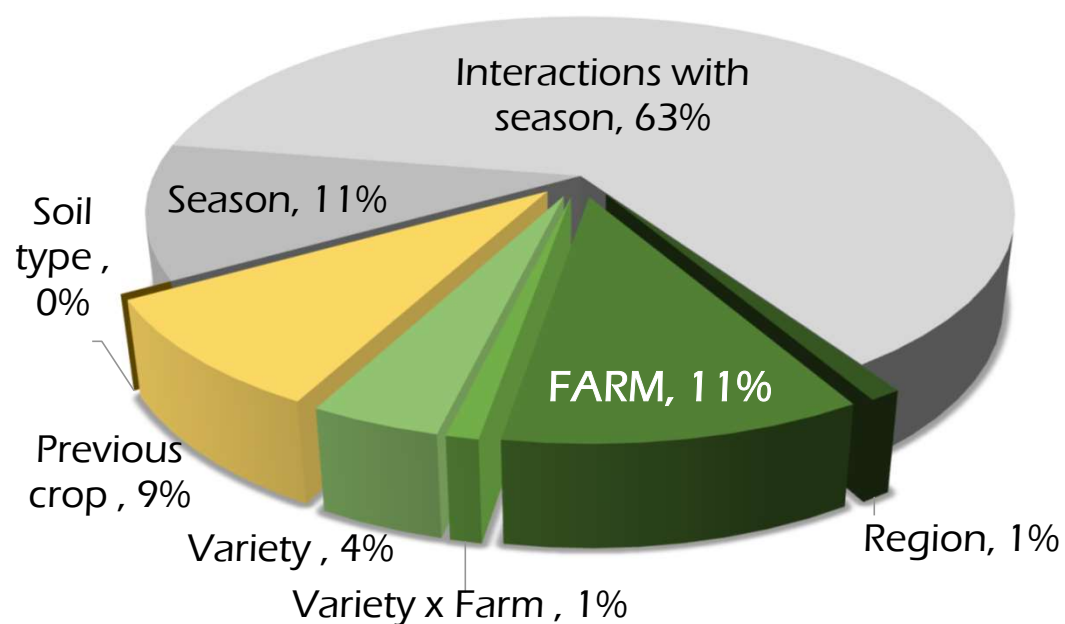**Factors contributing to variation in yield**

- Shows the importance of the **'Farm Factor'**

- Beyond what is explainable by region, year, soil, or husbandry

- Farm Factor could be associated with
  - Physical farm characters, e.g. machinery, finance…
  - Farmer characters, e.g. skills, attitudes, motivations, behaviours …

- 'Farm Factor' also explained most yield variation in other datasets (AHDB RL & LearN)
Sylvester-Bradley *et al*., 2019

RL Trials data, UK 2002–2018

Factors contributing to variation in yield

Interactions with season, 63%

Season, 11%

Soil type , 0%

Previous crop , 9%

Variety , 4%

Variety x Farm , 1%

FARM, 11%

Region, 1%

Average RL farm yields
- ● >8 t/ha
- ● >9 t/ha
- ● >10 t/ha
- ● >11 t/ha
- ● >12 t/ha

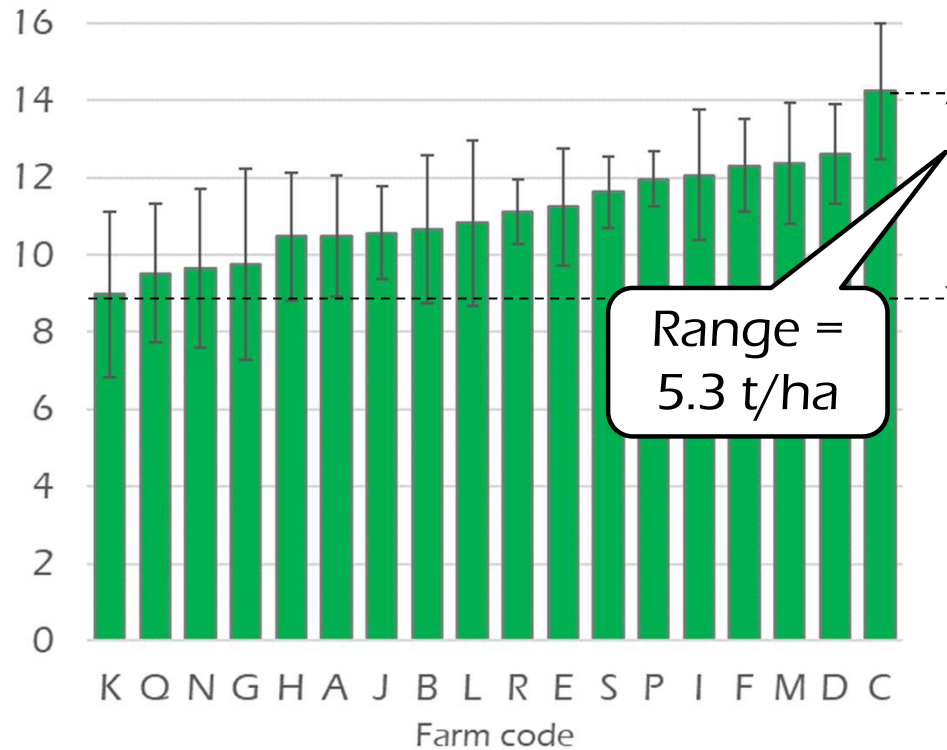# Tramline trials with different N rates

Factors contributing to variation in yield
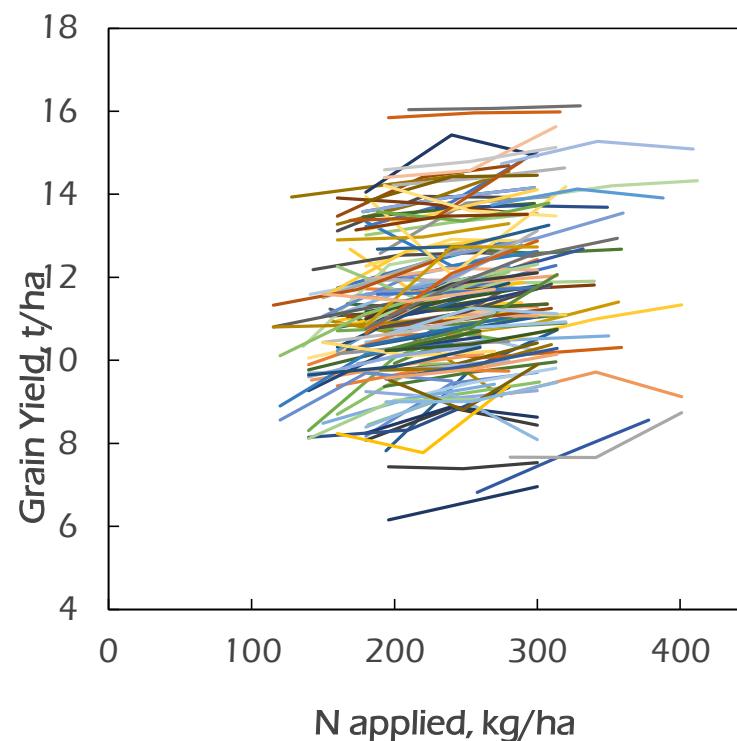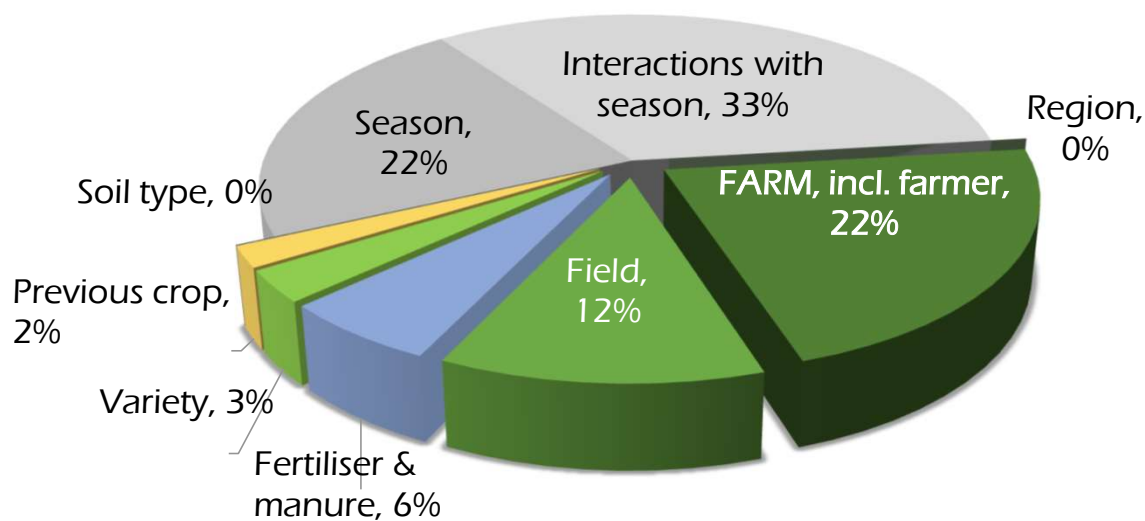
Large yield differences between YEN farms

Average wheat yield (t/ha) on 18 farms which entered YEN in 5 or more years

Range = 5.3 t/ha

YEN cereal yields exceeding 14 t/ha 2013-2022

Wide geographical spread of high yielding crops illustrates that regional weather factors and soil types are not critical for high yield
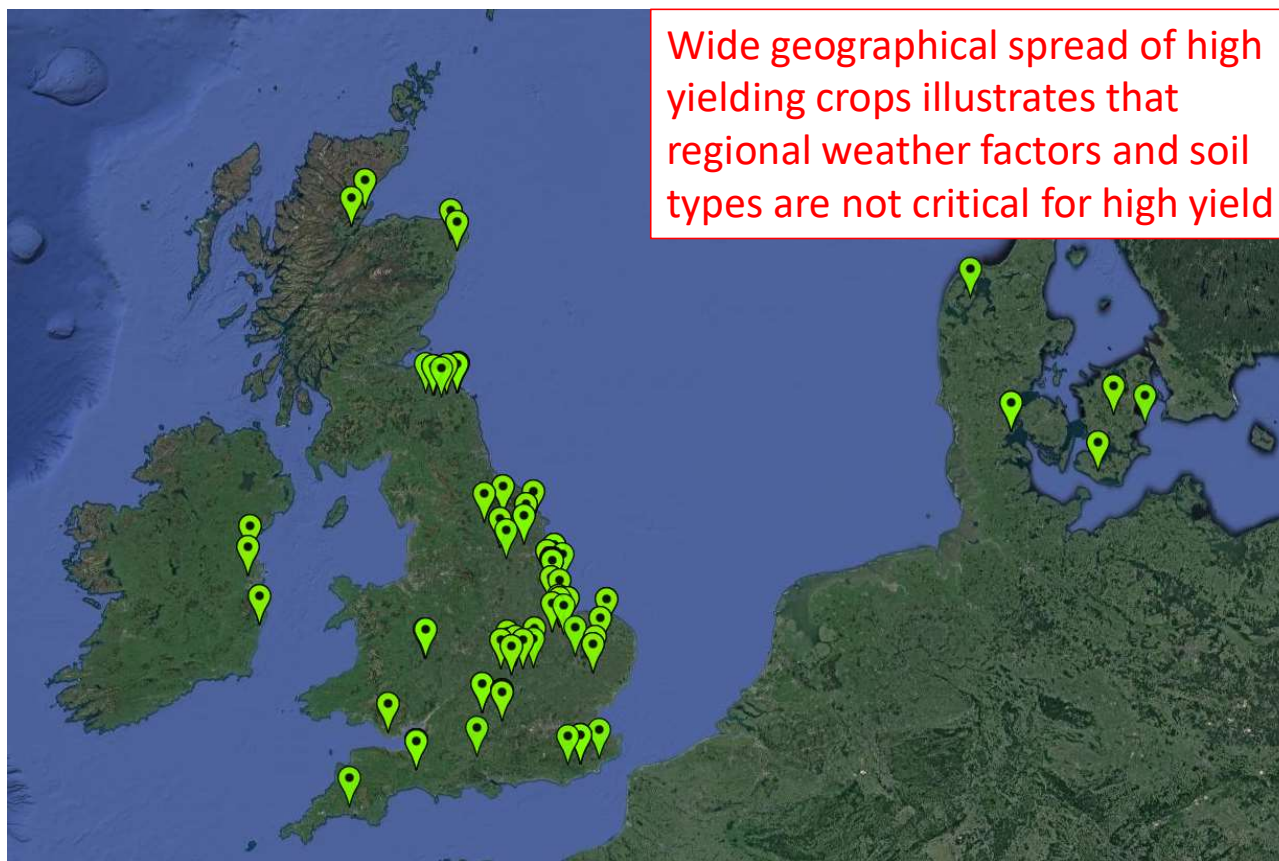
Farm Factor for grain protein
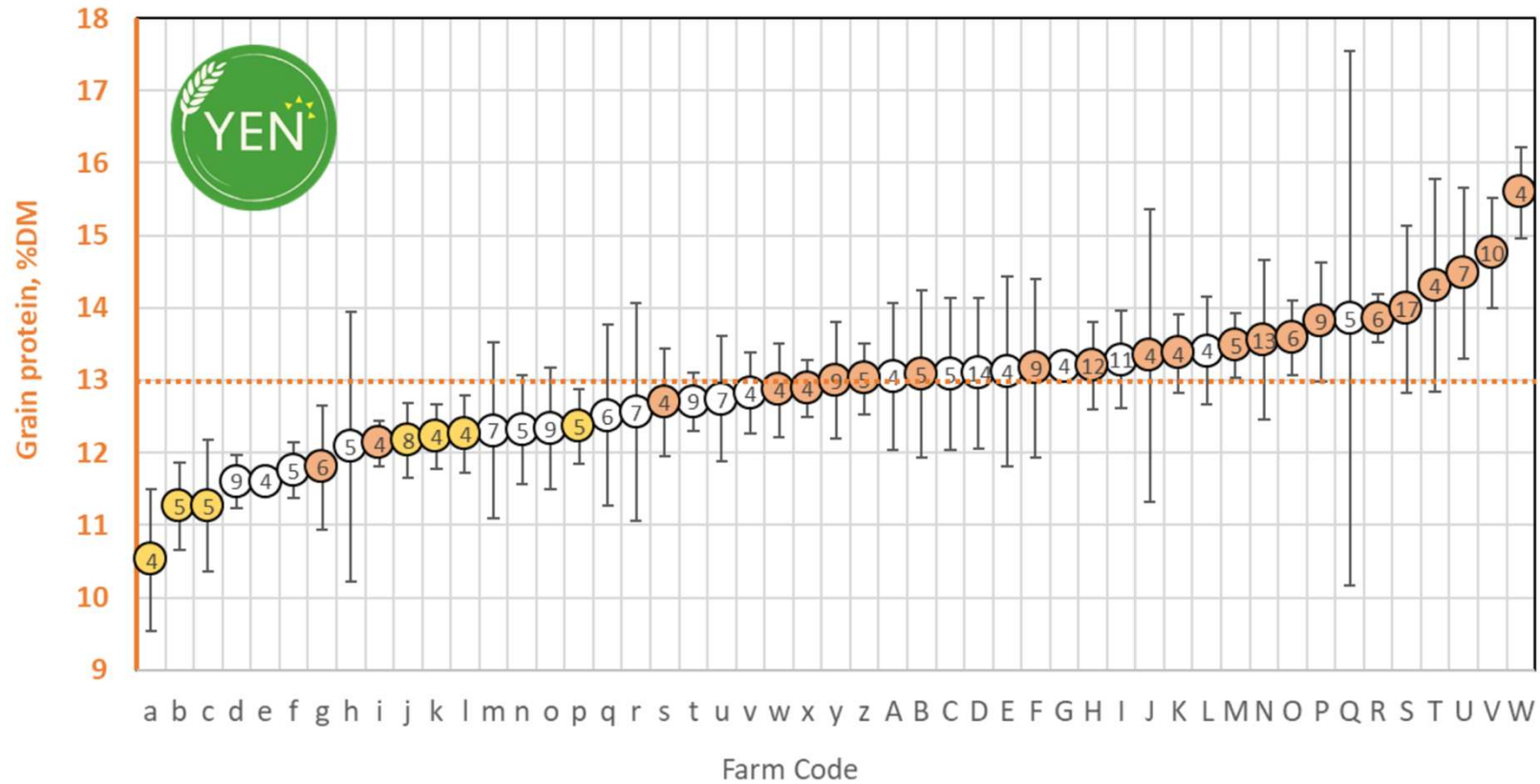
Orange circles: mainly Group 1; Yellow circles: mainly Group 2

What drives the Farm Factor?

FARM FACTOR

Enthusiasm for farming

Attention to detail

Ability to prioritise

Measurement & benchmarking

Long-term commitment

Testing ideas

Knowledge with experience

Unafraid of failed tests

Access to resources (e.g. contractors)

Often returning to farming from a different career

Trusted circle for advice
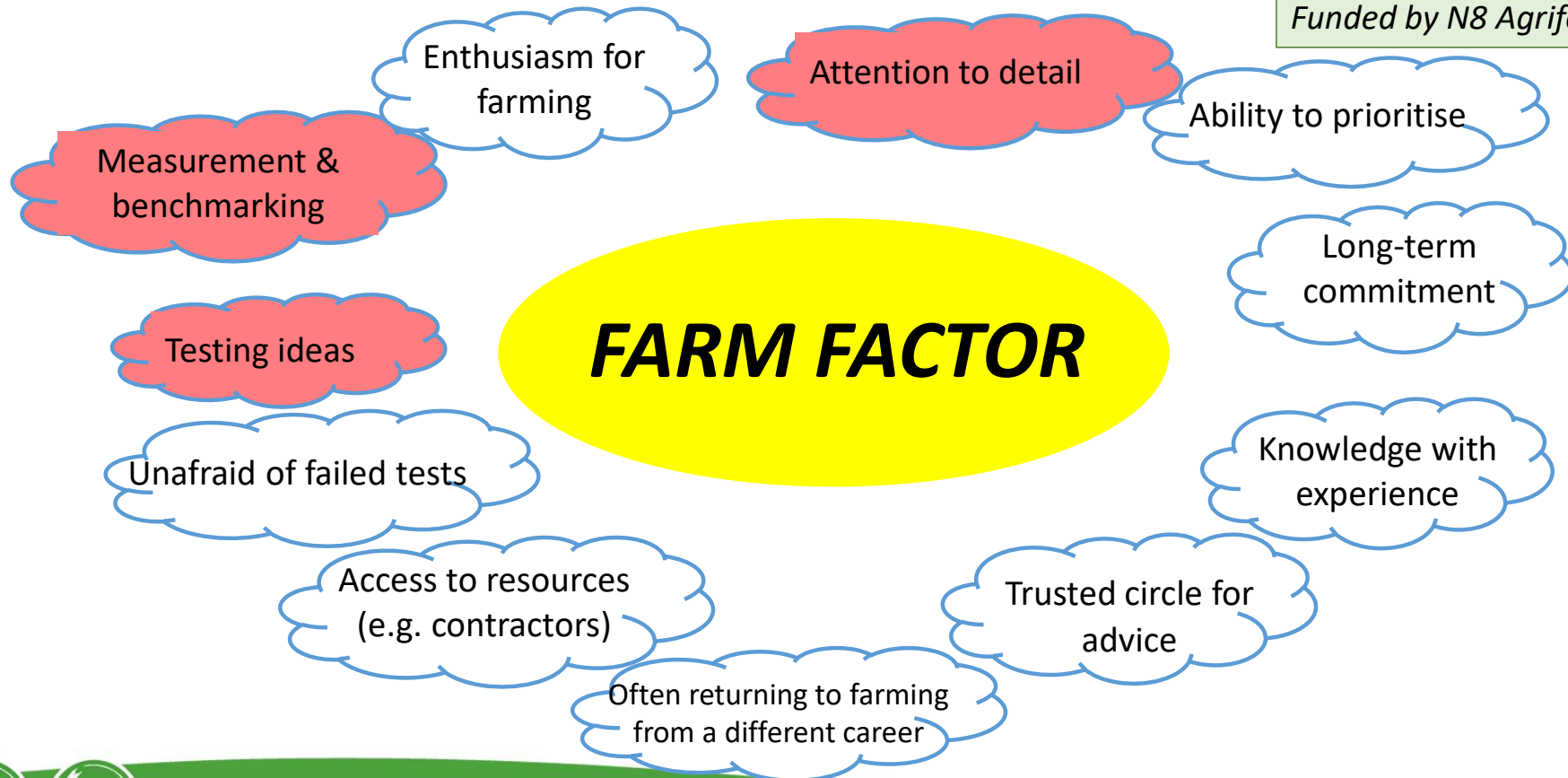
YEN Conference, Peterborough, 24.1.23

The characteristics of top performing farms

Philip Dolbear

AHDB Senior Knowledge Exchange Manager

Cereals and Oilseeds

Eight key differentiators

- **Minimise overheads**
- **Set goals and budgets**
- **Compare yourself and gather information**
- **Understand the market**
- **Focus on detail**
- **Have a mindset for change and innovation**
- **Continually improve people management**
- **Specialise**

BEEF & LAMB   CEREALS & OILSEEDS   DAIRY   PORK
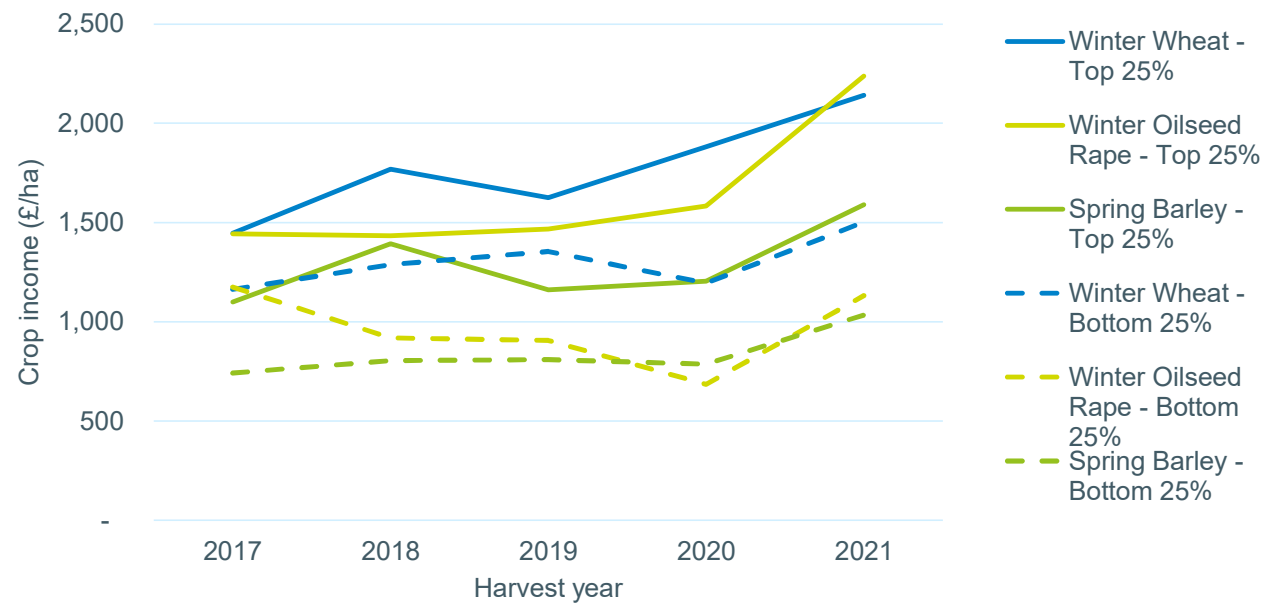
The analysis

FARMBENCH

AHDB

- Over 11,000 conventional combinable crop enterprise performance results for 2017 to 2021 harvest years

- 2022 estimated figures based on part of crop year at higher input prices

- 2023 forecast figures based on a full crop year at current inputs inflation rates

- 10% fertiliser usage reduction is assumed

Crops analysed
- Spring barley
- Winter barley
- Spring beans
- Winter beans
- Linseed
- Spring oats
- Winter oats
- Winter oilseed rape
- Feed peas
- Spring wheat
- Winter wheat

Top 25% income increased by around £500 to £800/ha over the five years

Chart: Crop income (£/ha) versus Harvest year (2017–2021)

Legend:
- Winter Wheat - Top 25%
- Winter Oilseed Rape - Top 25%
- Spring Barley - Top 25%
- Winter Wheat - Bottom 25%
- Winter Oilseed Rape - Bottom 25%
- Spring Barley - Bottom 25%

AHDB
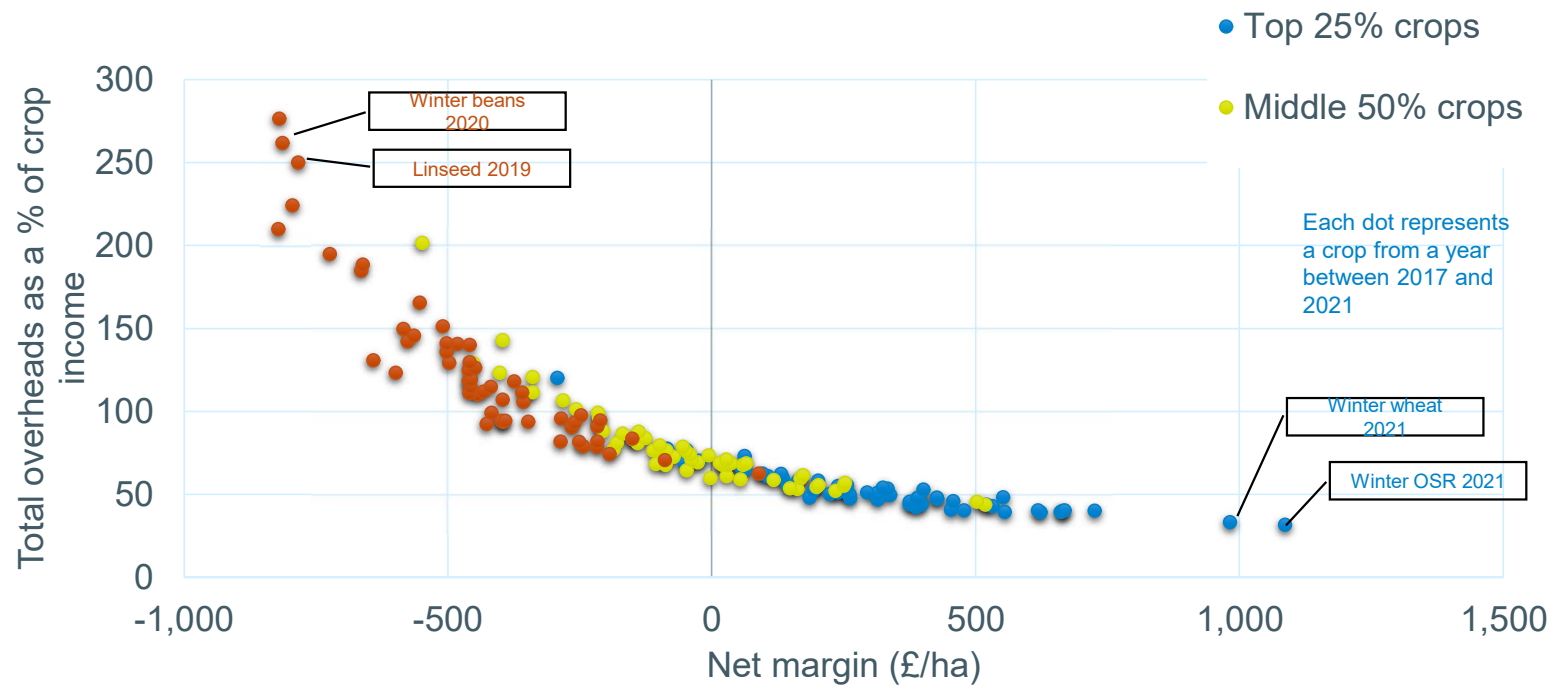
Winter wheat, OSR and winter oats top 5 year average net margins
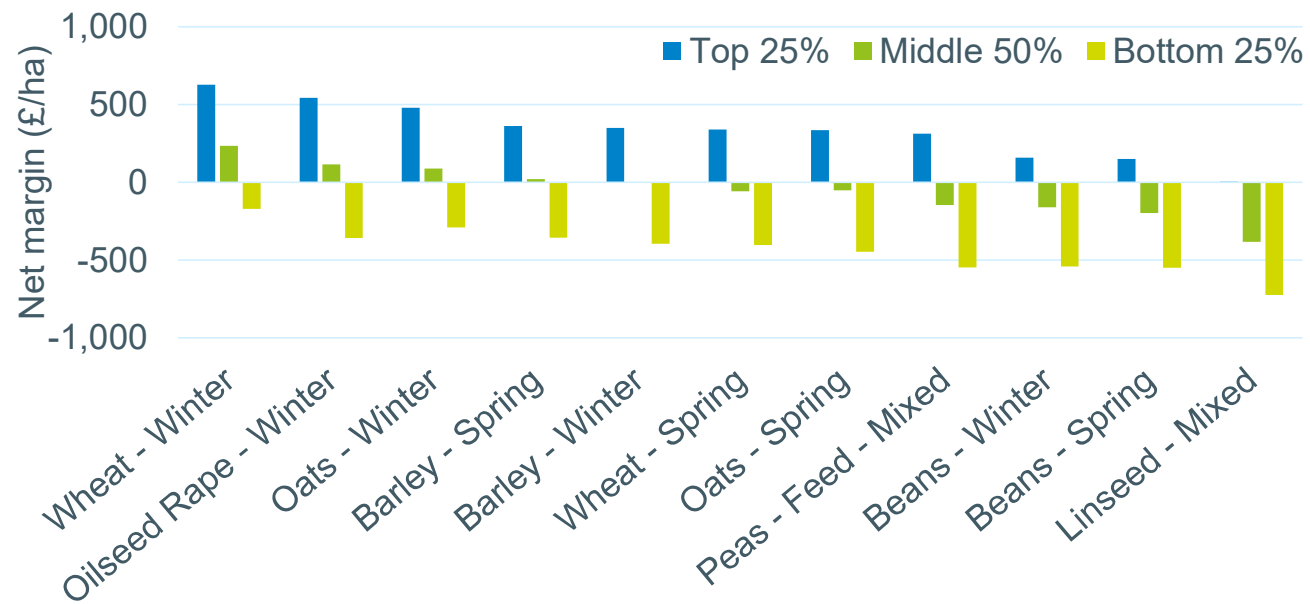
Most difference between performance levels come from income rather than costs

Difference between top 25% and bottom 25%

- Difference in income £/ha
- Difference in cost of production £/ha
- Average of Yield

Harvest year	2018	2019	2020	2021
Yield	8.7	9.7	8.2	8.9
Difference in income £/ha	£522	£317	£743	£743
Difference in cost of production £/ha	-£339	-£394	-£231	-£241
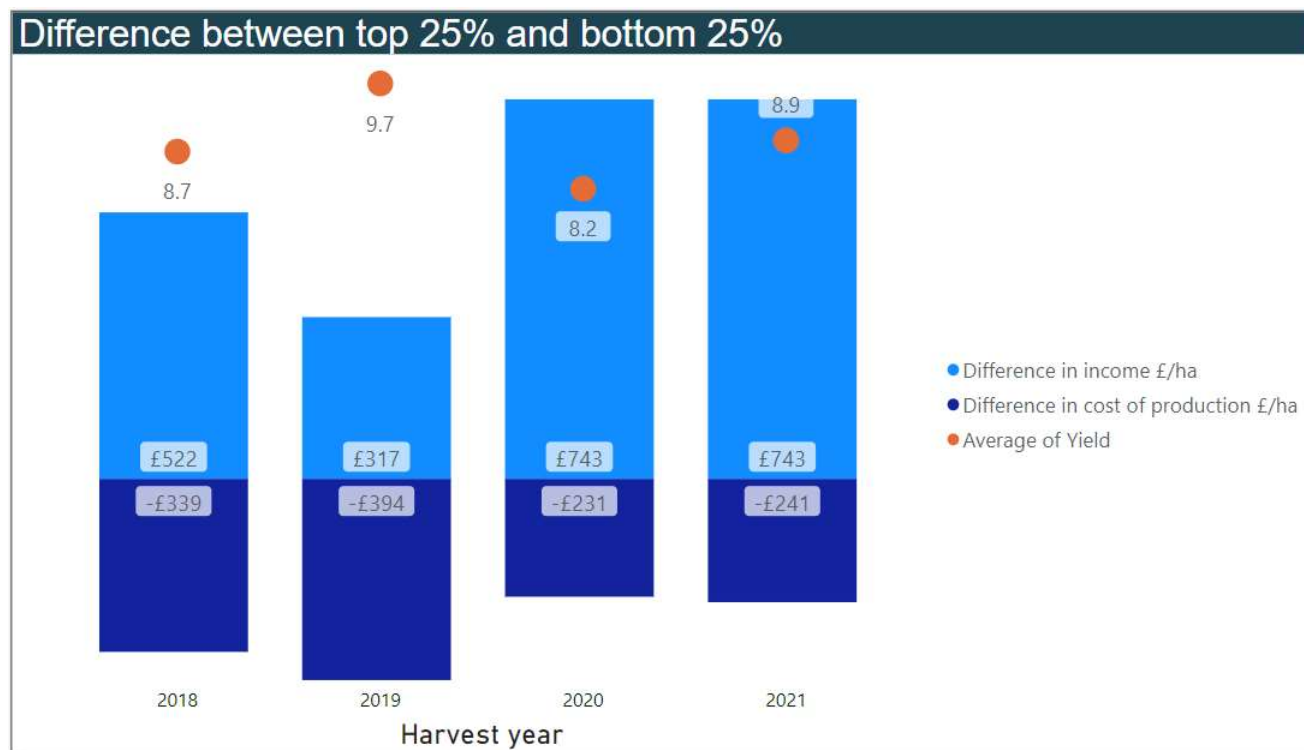
Average costs up 6% in five years, 15% in 2022 and 32% in 2023
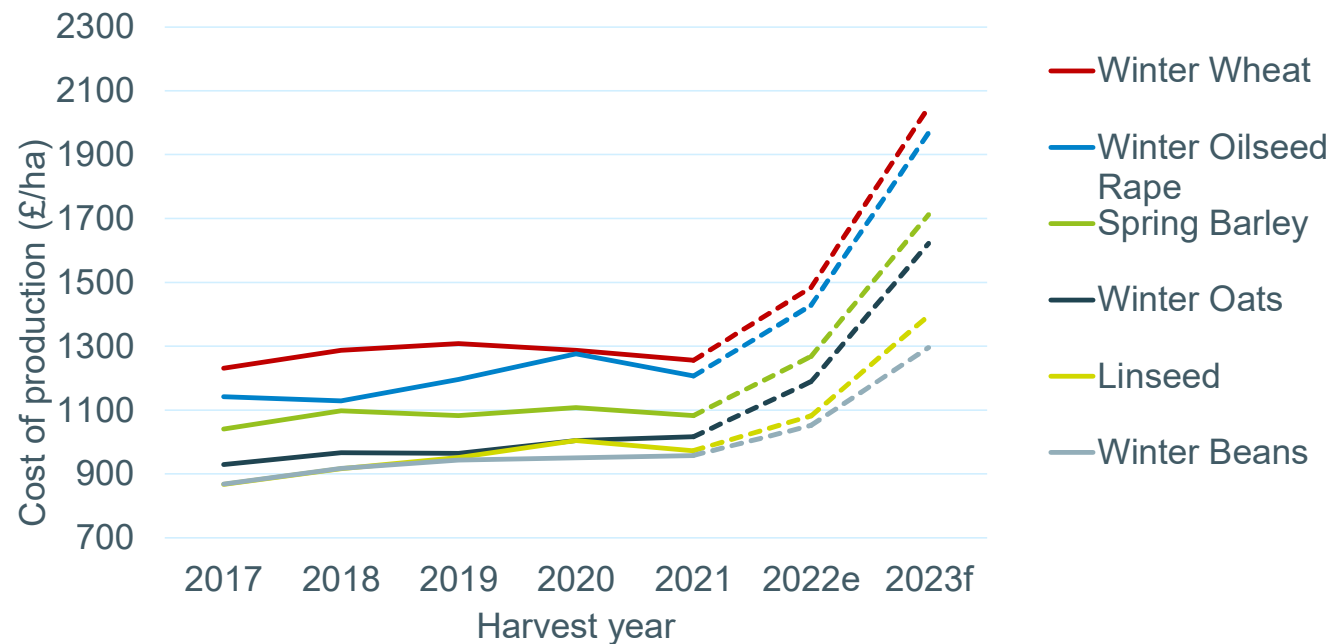
Middle 50% performers – ranked by net margin

Prices will have a greater impact than in previous years

AHDB

£/t	Middle 50%	Forward crop prices[1]	
	2021 (based on prices received)	2022 (based on Nov-22)	2023 (based on Nov-23)
Feed wheat	196	265	261
Feed barley	190	240	236
Oilseed rape	499	559	560

[1]as at 4/11/22

t/ha	Yields for the middle 50%	
	2021	5-year average
Winter wheat	8.8	8.9
Spring barley	6.5	6.3
Winter barley	7.5	7.6
Oilseed rape	3.4	3.4

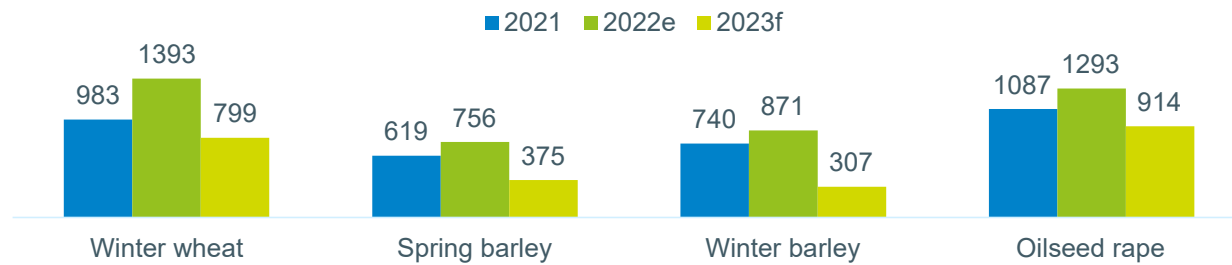## Total cost of production (£/ha) – middle 50%

■ 2021 ■ 2022e ■ 2023f

	Winter wheat	Spring barley	Winter barley	Oilseed rape
2022e	+18%	+17%	+20%	+18%
2023f	+38%	+35%	+37%	+38%

Net margin (£/ha) – middle 50%

■ 2021 ■ 2022e ■ 2023f

	Winter wheat	Spring barley	Winter barley	Oilseed rape
2021	516	219	468	490
2022e	939	326	675	473
2023f	337	-145	178	-64

AHDB

Net margin (£/ha) – top 25%

■ 2021 ■ 2022e ■ 2023f

Winter wheat: 983, 1393, 799
Spring barley: 619, 756, 375
Winter barley: 740, 871, 307
Oilseed rape: 1087, 1293, 914

Net margin (£/ha) – middle 50%

■ 2021 ■ 2022e ■ 2023f

Winter wheat: 516, 939, 337
Spring barley: 219, 326, -145
Winter barley: 468, 675, 178
Oilseed rape: 490, 473, -64

Eight key differentiators

- **Minimise overheads**
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- **Have a mindset for change and innovation**
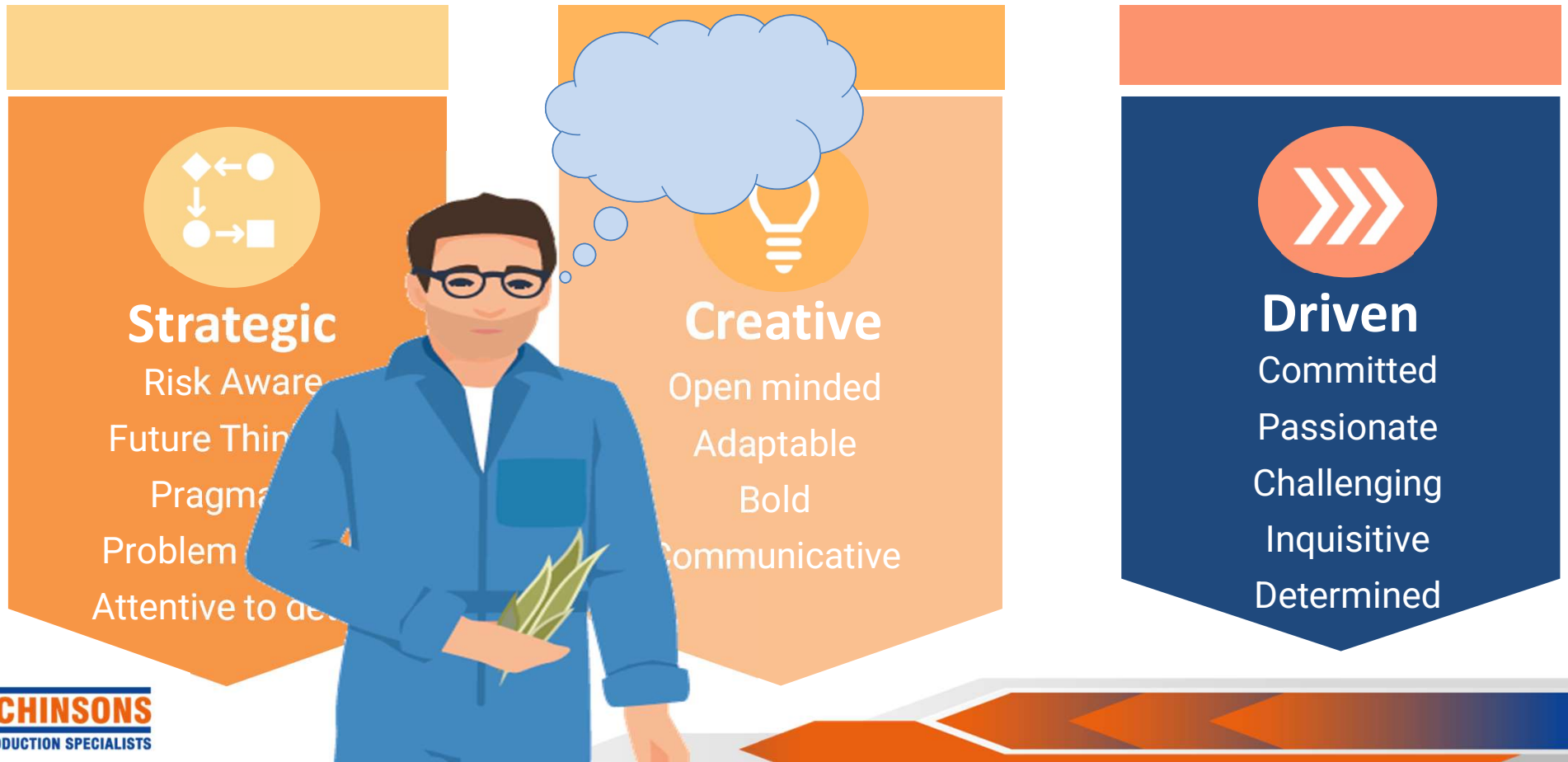- **Continually improve people management**
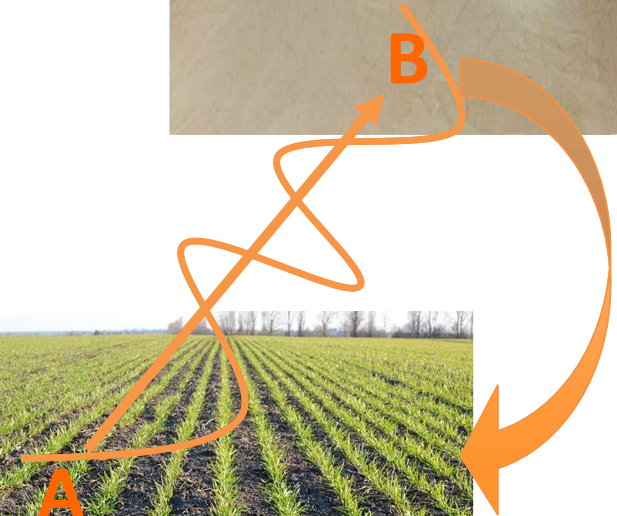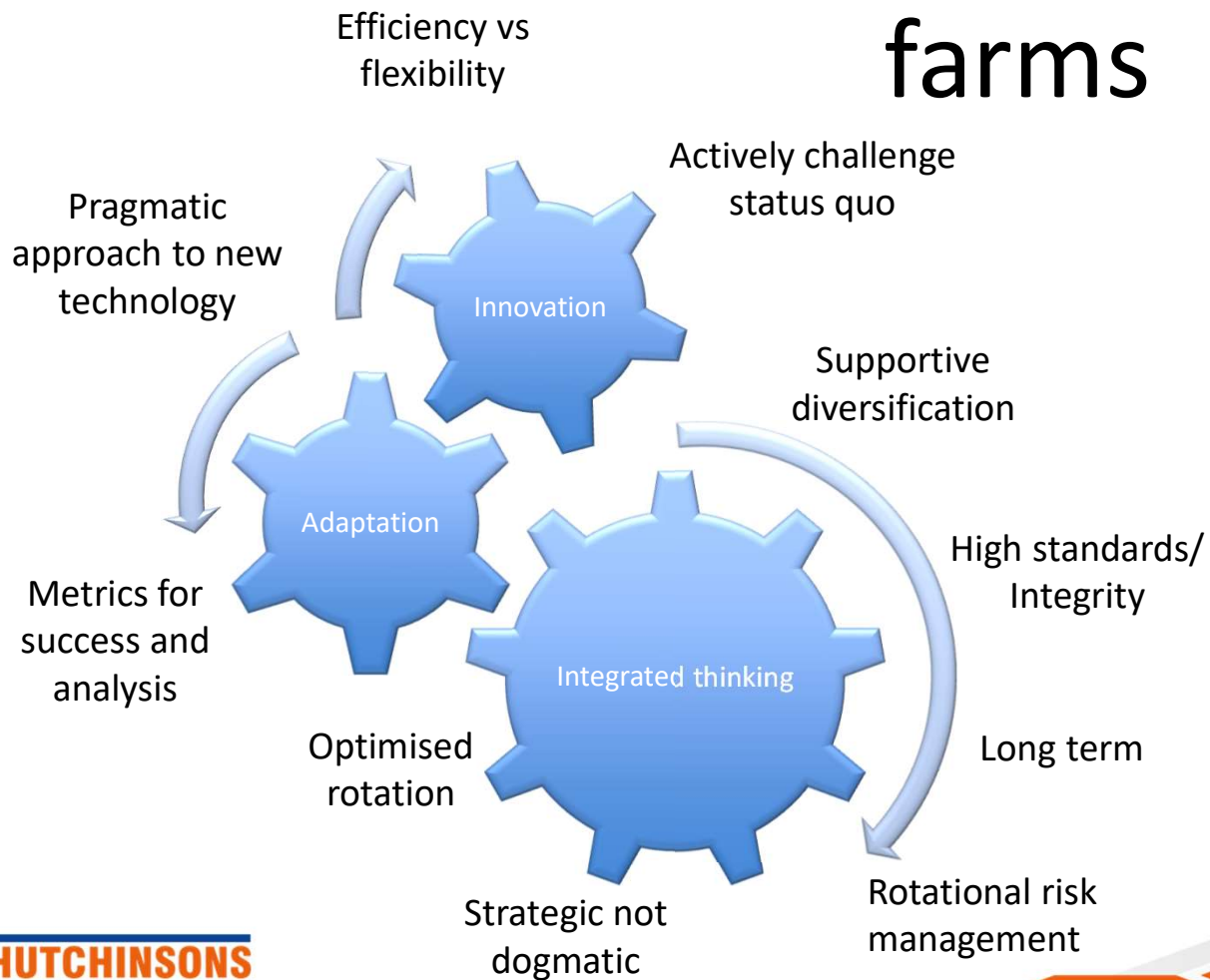- **Specialise**

BEEF & LAMB

CEREALS & OILSEEDS

DAIRY

PORK

'Inspiring our farmers, growers and industry to succeed in a rapidly changing world'

What makes up the "Farm Factor"- Grower Qualities

Strategic
Risk Aware
Future Thin
Pragma
Problem
Attentive to de

Creative
Open minded
Adaptable
Bold
Communicative

Driven
Committed
Passionate
Challenging
Inquisitive
Determined

HUTCHINSONS
CROP PRODUCTION SPECIALISTS

What are the key factors of high yielding farms

Efficiency vs flexibility

Pragmatic approach to new technology

Actively challenge status quo

Innovation

Supportive diversification

Adaptation

Metrics for success and analysis

High standards/ Integrity

Integrated thinking

Long term

Optimised rotation

Strategic not dogmatic

Rotational risk management

B

A

HUTCHINSONS
CROP PRODUCTION SPECIALISTS

What Are The farm Factors In My Opinion?

Physical Factors

Land Type and Layout

Land Tenure

Rotations

Potential markets for crops

Climate

Human Factors

Attitude of farmer

Ability of the farmer
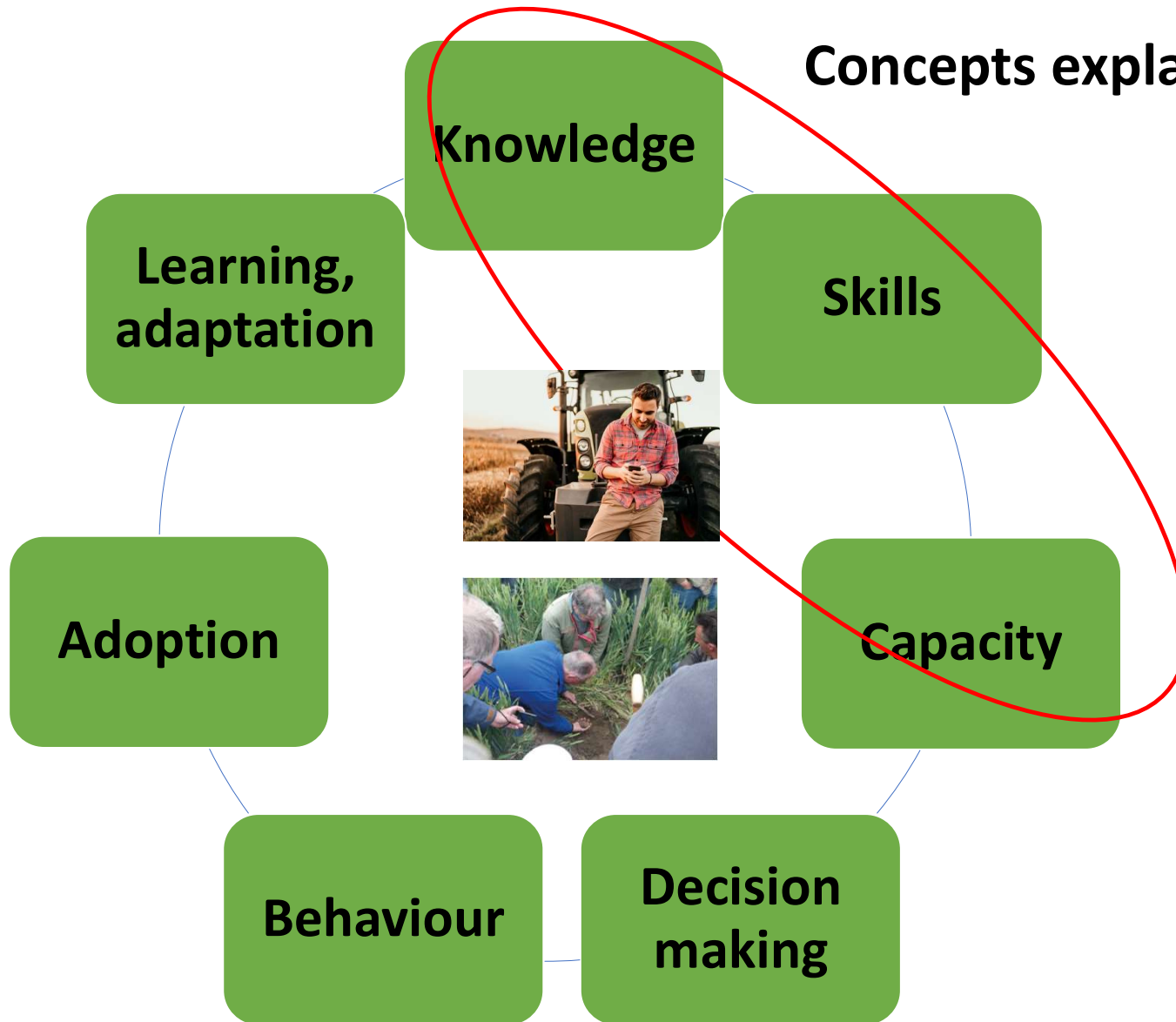
Farmers own interest

External factors

Family Matters

Social science research explaining the 'farm(er) factor'

Julie Ingram

Countryside and Community Research Institute

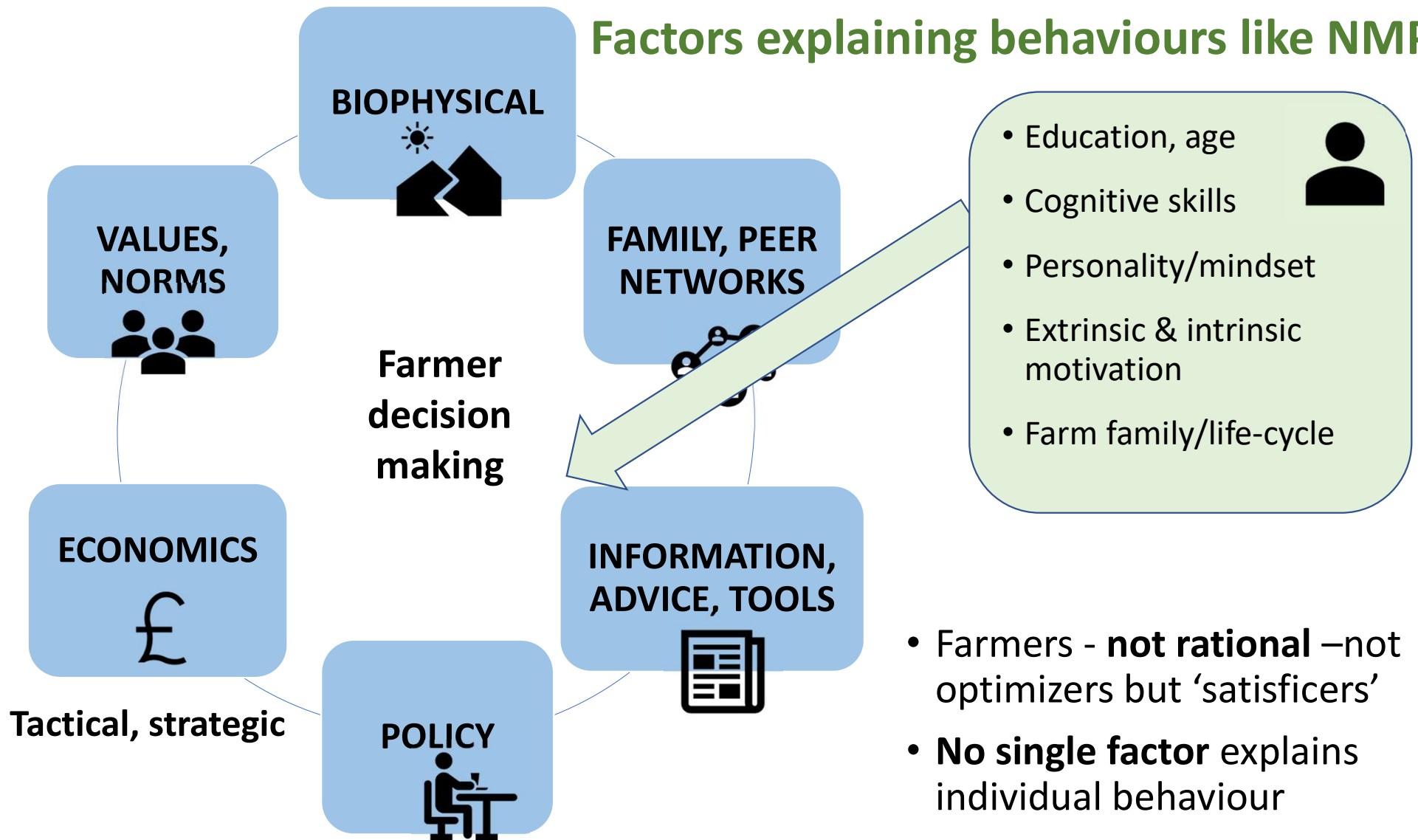University of Gloucestershire

Concepts explaining farmer factor

Knowledge

Skills

Learning, adaptation

Capacity

Adoption

Behaviour

Decision making

Know what, Know why, Know how, Know who

Managerial, business, entrepreneurial, technical, digital
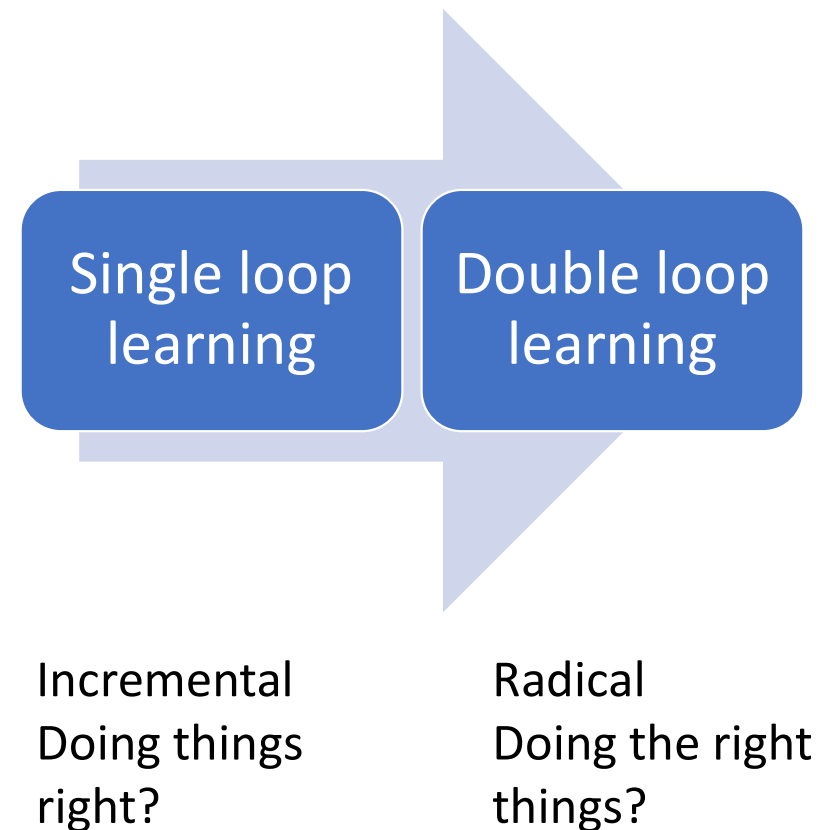
Capacity to use information & innovate

Factors explaining behaviours like NMP

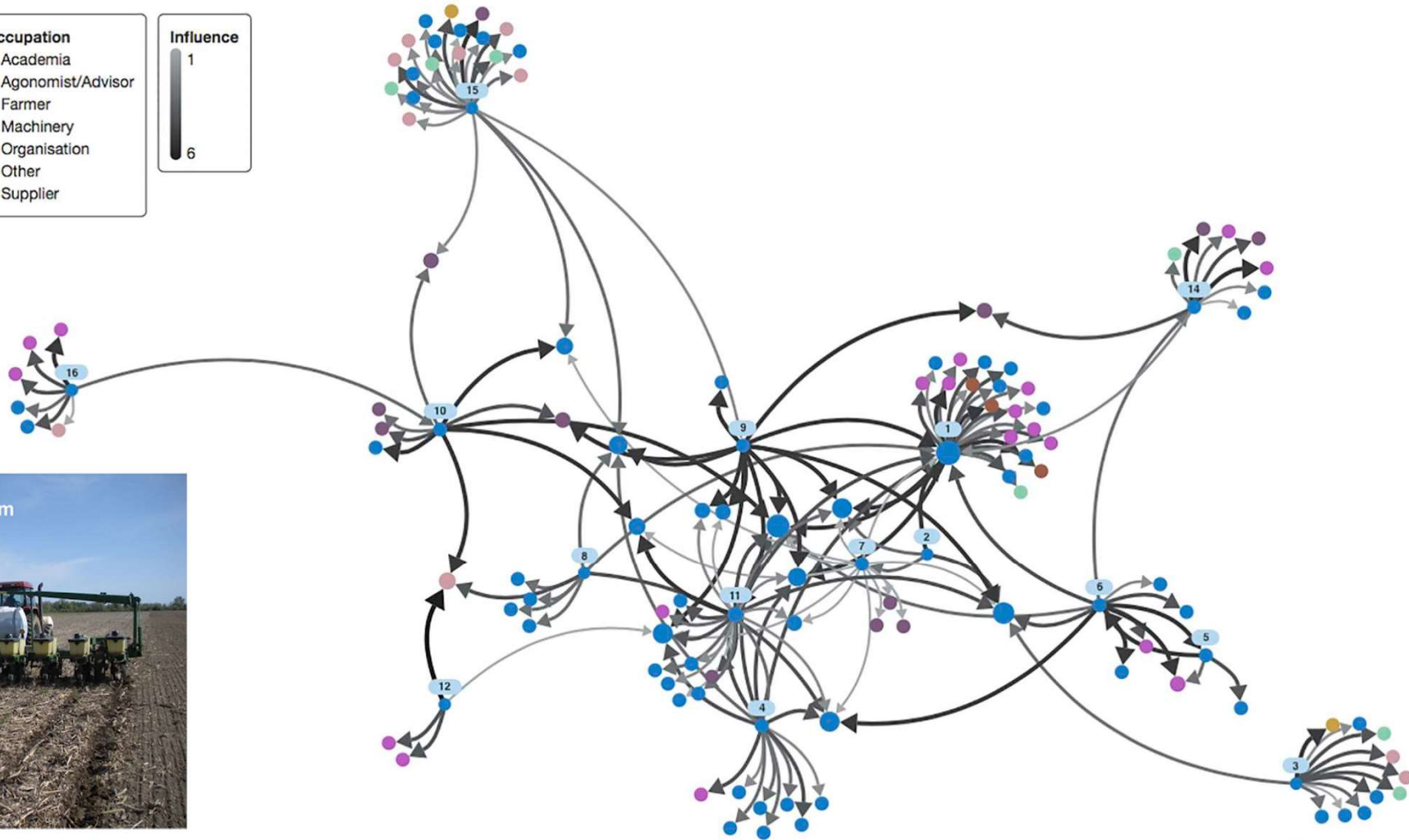BIOPHYSICAL

VALUES, NORMS

FAMILY, PEER NETWORKS

Farmer decision making

ECONOMICS

INFORMATION, ADVICE, TOOLS

Tactical, strategic

POLICY

- Education, age
- Cognitive skills
- Personality/mindset
- Extrinsic & intrinsic motivation
- Farm family/life-cycle

- Farmers - **not rational** –not optimizers but 'satisficers'
- **No single factor** explains individual behaviour

Learning, adapting, innovating

The Experiential Learning Cycle

Concrete Experience
(doing / having an experience)

Reflective Observation
(reviewing / reflecting on the experience)

Abstract Conceptualisation
(concluding / learning from the experience)

Active Experimentation
(planning / trying out what you have learned)

Single loop learning

Double loop learning

Incremental
Doing things right?

Radical
Doing the right things?

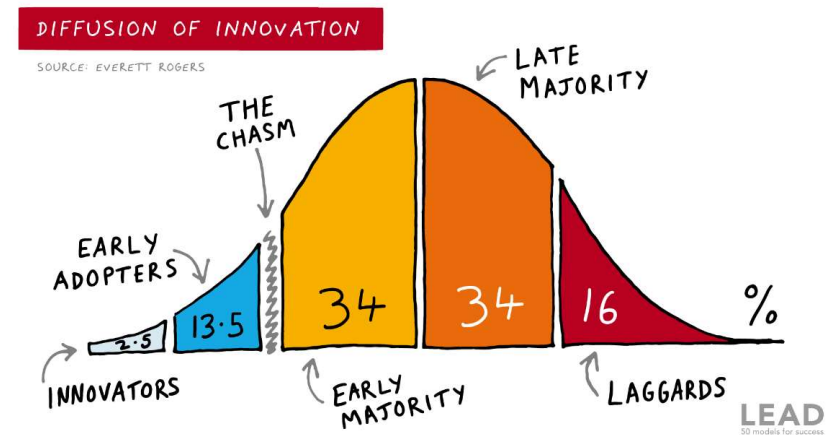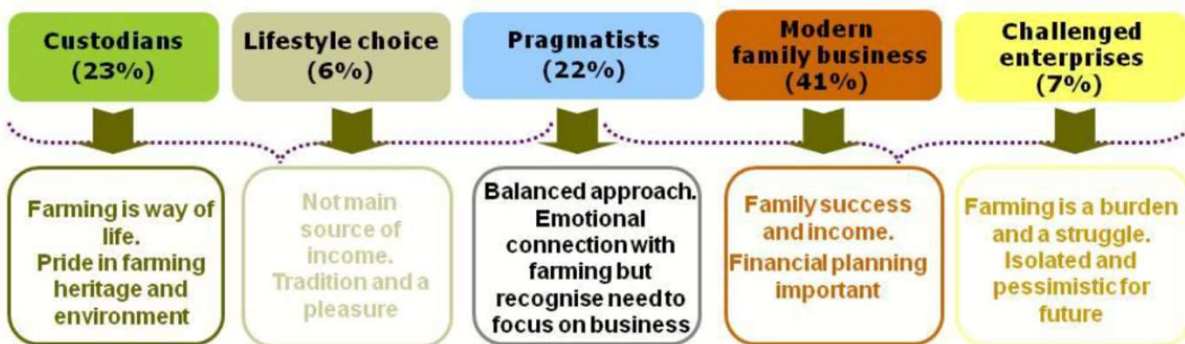# Knowledge intensive zero tillage in UK: farmer networks
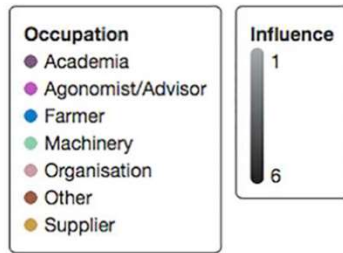
Skaalsveen et al 2020

Farmer typologies

- Concepts of 'good farmer' technically proficient/productive, resilient, stewardship
- Farmer types, learning styles

Being a 'smart' farmer- using information, data, tools

Decision Support Tools - What if?

Digital literacy - ability to obtain, process, understand, evaluate and use data and (digital) technologies to make informed decisions