

Downpatrick Monitor Farm

Meeting title: Technology

Date: 11 February 2020

Speakers: Craig Patrick, Precision Decisions



AFBI Research Update

- Evaluating the impact of a range of organic manures applied to arable land on soil, crop and NI agriculture
- Key objectives:
 - To complete a desk-top literature review of work to date on impact of organic manures to crops and soil relevant to NI with a section on the potential for increasing arable land area to act as sink for organic manures.
 - Initiate and complete 3 years of a long-term large-scale farmer’s field trial on spring barley to which a range of organic manures will be applied. Impact on soil and crop health will be monitored.
 - Study the environmental fate of organic manure-derived pathogens in arable soils on a site that has previously received minimal or no manure applications. DNA extraction and microbiological techniques will be used to detect pathogen presence in organic manures prior to application and to determine their persistence in the soil following application.
- Looking to assess soil health, crop performance and pathogen fate

	Treatment	Application width (m)	Method
1	Control (no fertiliser)	NA	NA
2	Control (inorganic fertiliser)	12	Kuhn
3	Digestate	6	Slurry Kat
4	Digestate +	6	Slurry Kat
5	Green waste	9	Spreader
6	Pig slurry	6	Slurry Kat
7	Cattle slurry	6	Slurry Kat
8	Broiler litter	9	Spreader
9	Pelletised poultry manure	12	?
10	Layer manure	9	Spreader
11	Cattle FYM	9	Spreader

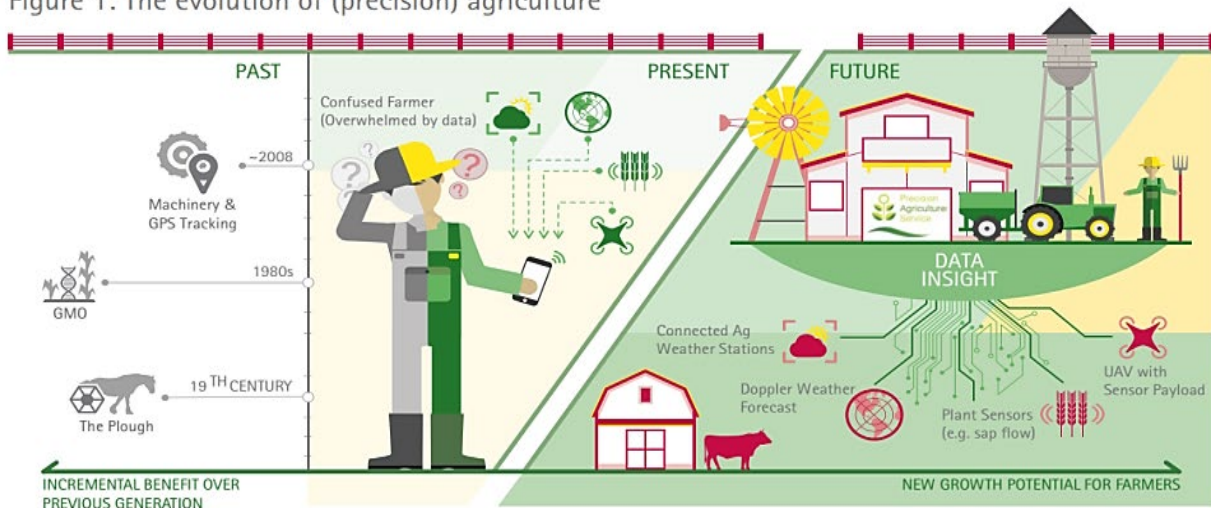
Precision Technology and how it fits

- Key areas of precision agriculture at a glance
 - **Hardware** – GPS technology, receivers, RTK, auto-steer, variable rate control, yield monitors...
 - **Mapping** – Prescription maps, yield maps, application maps, soil maps, gross-margin maps...
 - **Data** – Crop sensors, satellites, drones, artificial intelligence, weather stations
- Hardware - Benefits
 - Reduced overlaps
 - Reduced input rates
 - Increased efficiency
 - Reduced operator fatigue?
- Mapping – available for the following:
 - Soil Nutrients
 - Variable rate drilling
 - Variable rate fertilizer
 - Variable rate lime
 - Variable rate ag chemicals
 - Satellite biomass
 - As-applied maps
 - Yield maps
 - Protein maps
 - Gross-margin maps
 - Soil type
 - Drone map
- Practical reality of variable rate options
 - Satellite: 2 minutes to sort data - Fast, known inaccuracies, rough around the edges
 - Existing Dataset: 15 mins – 2 hours to sort data - Moderate amount of time, accurate, practical.
 - Drone: 6-8 hours* to sort data - Time consuming, post-processing, poor end result.

Take-home messages

- Understanding what you are wanting to achieve is vital
 - Think about investment?
 - What's your motivation, what's the return?
 - How do you build the business case for Precision Farming?
 - Without one you will waste money
- When thinking about mapping, start with the basics – soil and yield

Figure 1: The evolution of (precision) agriculture



Making Technology Pay

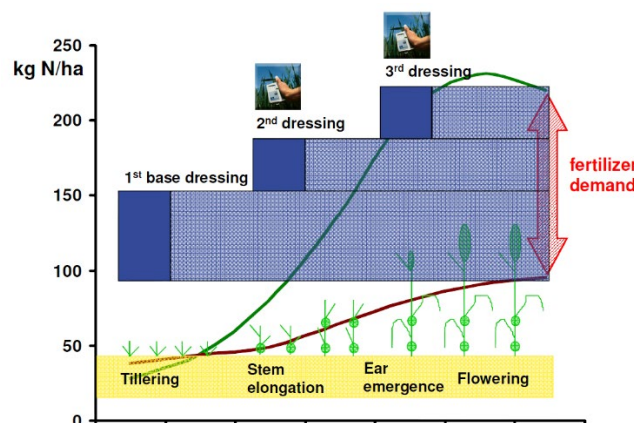
- Nitrogen Use Efficiency - Ratio of additional yield produced to the amount of nitrogen applied to achieve that increase. Often expressed as kg additional yield per kg N applied
- On average 40% of the nitrogen fertiliser applied isn't utilised by crops – if you spend £143 on fertiliser, £57 of that isn't utilised
- In trials at the York monitor farm they trialled using more smaller N doses using the N Tester recommendations and found that they could increase the NUE to 83%
- In the UK we grow 1.4-2.1 million ha of wheat a year, with an average N rate of 220 kg N/ha if we achieved a 15% saving in applied N it would be equivalent to 294,000 tons of CO₂

Take-home messages

- Think about N use efficiency and what you can do to improve it.

Further information

- [RB209 Section 1 Principles of nutrient management and fertiliser use](#)
- [Soil assessment methods](#)
- More information from the GREAT soils programme is available at ahdb.org.uk/greatsoils



AHDB resources


- Understand your business costs with AHDB's benchmarking tool Farmbench at ahdb.org.uk/farmbench
- Monitoring tools are available at ahdb.org.uk/tools
- Sign up to market information and research newsletters at ahdb.org.uk/keeping-in-touch
- Find out what's going on at other Monitor Farms and Strategic Farms at ahdb.org.uk/farm-excellence
- All AHDB events can be found at ahdb.org.uk/events
- For guidance on how Brexit will impact your business, see ahdb.org.uk/brexit

Contact details

For more information contact: Michelle Nuttall

E: Michelle.Nuttall@ahdb.org.uk

M: 07778 143404

 [@Cereals_NW_NI](https://twitter.com/Cereals_NW_NI)

AHDB

Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

T 024 7 669 2051
E info@ahdb.org.uk
W ahdb.org.uk
 [@AHDB](https://twitter.com/AHDB)



CEREALS & OILSEEDS

© Agriculture and Horticulture Development Board 2020. All rights reserved.