



AFCP Forum

Paper 4: The role of charities in early career development



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NIAB TAG

Plant Science into Practice

About myself

- From a non-farming background
- Interested in agriculture from a young age
- Attended college to complete vocational training (BTEC Diplomas)
- Completed Degree in Agriculture and became very interested in research
- Went on to complete PhD in Plant Sciences at Reading University



Strip tillage unit purchased from Illinois, USA with support from The Douglas Bomford Trust



U.S. study tour to examine strip tillage funded by The RJ Harrison Trust – May 2005



Current Role

- Currently the 'Farming Systems and Soils Specialist' at NIAB
- The role involves the technical management and delivery of research projects within applied research programmes and to lead and develop expertise in the area of applied soil science.

Strip tillage - European experiences



RJ Harrison Trust
funded study tour to
Germany for a two day
strip tillage workshop in
May 2011



New Farming Systems (NFS) research project

- The NFS series of experiments started in 2007 and are located at Morley (Norfolk) on a sandy loam soil.
 - NFS delivers several ongoing (large scale fully replicated) rotation projects focusing on improving resilience and output.
- Main research themes:
 1. Cover crops: The evaluation of the potential fertility building benefits of cover crops and/or legume bi-crops within rotation systems.
 2. Cultivations: Examining cultivation suitability within defined approaches.
 3. Amendments: Determining the value of amendments to soils and rotation systems.
- Two more recent studies started in 2011:
 - MORE (Manure and Organic Replacements Experiment).
 - LESS (Low Energy Sustainable Systems).

STAR Project

(Sustainability Trial for Arable Rotations)



National Agronomy Centre

Rotations

- Winter Cropping
- Spring Cropping
- Continuous W Wheat
- Alternate Fallow

X

Establishment

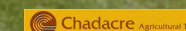
- Annual Plough
- Deep non-inversion
- Shallow non-inversion
- Managed Approach

= 16 treatments

X 3 replicates

Cropping

Rotation	2006 (Year 1)	2007 (Year 2)	2008 (Year 3)	2009 (Year 4)	2010 (Year 5)	2011 (Year 6)	2012 (Year 7)	2013 (Year 8)	2014 (Year 9)	2015 (Year 10)
1 Winter cropping	WOSR	Wheat	Winter beans	Wheat	WOSR	Wheat	Winter beans	Wheat	WOSR	Wheat
2 Spring cropping	Spring Beans	Wheat	Spring Oats	Wheat	Spring Beans	Wheat	Spring Linseed	Wheat	Spring Oats	Wheat
3 Cont wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat	Wheat
4 Alt fallow	Fallow	Wheat	Fallow	Wheat	Fallow	Wheat	Fallow	Wheat	Fallow	Wheat





Mid Pilmore and CSC

New Farming Systems

STAR

NFS, NIAB TAG



Centre for Sustainable Cropping, JHI



Mid Pilmore, JHI



The James Hutton Institute



STAR, NIAB TAG



JC Mann Trust

- Integration of major UK field experiments
- Research will assess differences in soil conditions for plant growth at 3 long term systems sites
- Objectives include:
 - quantification of differences in soil carbon concentration / SOM
 - measurement of the impact of soil management on crop performance
 - quantifying farm gate impacts of shifts in management practice
 - delivery of practical tools and definition of favourable soil physical conditions for cereal production.

Saxmundham Experimental Site

- Long-term experimental site started in 1899.
- Experiment looking at the effects of manure and fertiliser amendments on crop performance.
- Recently the site was acquired on a long-term lease by TMAF and has been brought back into cropping following a period when it was left fallow.
- This important long-term experiment provides a platform to develop research activities supporting research and educational groups.



Support from charities - Summary

Supported project	Charity
PhD	The Morley Agricultural Foundation and The Chadacre Trust
Farm equipment	The Douglas Bomford Trust
U.S. Study Tour	The RJ Harrison Trust
German Study Tour	The RJ Harrison Trust
Sustainability, Performance and Yield (SPY) – on brash soils	The John Oldacre Foundation
New Farming Systems (NFS) project	The Morley Agricultural Foundation and The JC Mann Trust
Sustainable Trial in Arable Rotations (STAR) project	The Felix Thornley Cobbald Trust and The Chadacre Trust
Saxmundham Experimental site	The Morley Agricultural Foundation

Support from charities has developed my career

- My current role within NIAB as the 'Farming Systems and Soils Specialist' has allowed me to develop expertise in:
 - Farming Systems
 - Crop performance
 - Soil structure
 - Soil function and fertility
- The farming systems programme funded through charitable support has become increasingly widely recognised, both nationally and internationally, as a leading, long term, independent research programme exploring ways to improve the sustainability, resilience and output of arable farming systems.

The challenges for the industry

- Global population is expected to increase from 7 billion today to over 9 billion by 2050.
 - Hunger remains widespread with around 925 million people experiencing hunger.
 - Many current systems of food production are unsustainable due to:
 - Soil loss from erosion;
 - Loss of soil fertility, salination and other forms of degradation;
 - Heavy reliance on fossil fuel-derived energy for synthetic fertilisers, agrochemicals and pesticides.

How support from charities can better support the industry

- Support for funding long-term system and soil management research is difficult to secure funding.
 - Economic returns are sometimes difficult to quantify.
 - Outcomes from research can sometimes be unexpected – difficult to set hypothesis at the outset.
- Wider collaboration between charities could help secure funding for much needed research in areas of agriculture e.g. soil science and help to develop the next generation of skilled workforce ready to meet the challenges ahead.

How support from charities can better support the industry

- Charities have a beneficial role in supporting the industry through:
 - Encouraging and supporting new entrants into the industry through training and education e.g. formal training and studentships.
 - Support and promote the ongoing workforce of the agricultural industry. Identify skills and knowledge gaps and support accredited training to assist businesses develop their workforces for **21st Century farming**
- AFCP may be able to provide a matrix of key areas for support to assist with targeting research

AHDB Cereals & Oilseeds Research and Knowledge Exchange Priority Matrix 2015–2020



Aims	Priority Targets for Knowledge Exchange	Crop Management	Natural Resources and the Environment	End Use Quality
Inform On-farm Decisions	Identify, analyse and manage constraints on production	<ul style="list-style-type: none"> Black-grass control Effective weed management in the rotation Resistance to pesticides Cost-effective integrated crop management options 	<ul style="list-style-type: none"> Avoiding and alleviating soil compaction Better understanding of soil biology Improving soil health 	<ul style="list-style-type: none"> Reducing input costs while maximising market returns, e.g. yield versus end use quality in a volatile market
				<ul style="list-style-type: none"> Monitoring tools Prediction End quality Yield Over inputs
Improve Business Opportunities				<ul style="list-style-type: none"> Research in regional Methodologies Research in food and Research in livestock Research for improved
Prepare the Industry	Impact scenarios			
	<ul style="list-style-type: none"> Develop early warning systems for pest and disease risks Assessment of costs and benefits of novel technologies 	<ul style="list-style-type: none"> Greater spread of pest, weed and disease Monitoring for new and emerging threats to crop production Improved targeting of crop inputs Optimum rates and timings of crop nutrients 	<ul style="list-style-type: none"> Improved linkage of weather forecasts to decision support tools New technologies for precision application of crop inputs 	<ul style="list-style-type: none"> Rapid warning/detection systems for acrylamide, ergot and fusarium mycotoxins New technologies for plant breeding and rapid phenotyping to develop more resilient varieties

A matrix of possible research areas of interest to charities could assist with targeting proposals to appropriate charities.

Picking a high profile project behind which charities could unite forces as a one-off initiative, or perhaps an on-going sponsored studentship that comes up every three years.

How support from charities can better support the industry

- What percentage of the workforce in agriculture have no qualifications at all?
73% of employers in our sector think there is no need for training because their staff are proficient.
- 18% which beats every other sector
- What do you think the top barrier to training cited by employers in our sector is?
 - a) No money available for training
 - b) No training available in relevant subject area
 - c) All staff are proficient / no need for training
 - d) Too busy for training

New infrastructure :



Course Finder



Level	Sector	Role
Any	Any	Any
Dates and locations	Course Title	
To be scheduled	Black-grass management - theory into practice	
To be scheduled	Disease management in oilseed rape	
Winter/spring 2016, various locations	Optimising nutrients for combinable crops	
Winter 2016, various locations	Rotations and soil fertility in combinable crops	
Autumn/winter 2015-16, Cambridge	Practical management of soil compaction	
To be scheduled	Spray applications	
Spring 2016, Cambridge	Principles of weed and pest management in combinable crops	
Winter 2015-16, various locations	Disease management in wheat	
Autumn/winter 2015-16, various locations	Soils - Foundation	
Autumn/winter 2015-16, Cambridge	Principles of water management and crop irrigation	
To be scheduled	Principles of soil and water management (non-irrigated crops)	
Autumn/winter 2015-16, various locations	Principles of nutrient management in field vegetables	



Available courses



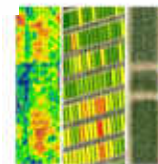
Wheat disease control

Devoted by NIAB TAG's [Bill Clark](#)

Learn about fungicide management and gain access to the unique variety fungicide planning tool which allows users to see how individual varieties respond to fungicide inputs. Also included is a wheat disease database that covers identification, biology and control. This is an ideal follow-up to the principles learnt in our Wheat disease identification e-learning course.

[Read More](#)

[Click Here to Subscribe](#) [Click Here to Login](#)



The science behind remote sensing

Devoted by NIAB TAG's [Bill Clark](#) with input from [Eric Olson](#) and [John Cassam](#)

This course explains the science behind some of the remote sensing techniques that are used in modern farming. It explains satellite, air-borne and tractor-mounted sensors, what they actually measure and how to interpret the images. Understanding the science behind these technologies will allow you to use them more effectively on farm to help manage your inputs.

[Read More](#)

[Click Here to Subscribe](#) [Click Here to Login](#)

Duration: 2 hours - self paced



The arable year

Devoted by NIAB TAG's [Nick Watson](#) and [Liz Robinson](#)

This entry level course gives an overview of arable agriculture, showing the process of growing six common arable and cereal crops over the course of a year, as well as methods of soil tillage.

Resilient rotations...spring 2016



Resilient Rotations Model

Model

Results

GM Heavy

GM Light

Land Type

Heavy

Save/Send current status

Number of Years

4

Cropping Year

Year 1

Year 2

Year 3

Year 4

Crop Species

Wheat

Oilseed Rape

Barley

Wheat

Milling/Malting



Drilling Date

Early

Mid

Mid

Early

Preceding Cover Crop



Cropping

Winter Wheat Milling

Winter Oilseed Rape

Winter Barley

Winter Wheat

Users Gross Margins



Position in Rotation

1

1st

1st

1st

Oilseed Rape Frequency

25%

Primary Cultivation System

Plough

Deep Non-Inversion

Shallow Non-Inversion

Direct Drill

Yield loss analysis

Yield Loss Analysis						
	1 st WW	2 nd WW	3 rd WW	W OSR	WW	WOSR
Cultivation System	0.00	0.00	0.00	-0.42	0.00	-0.42
Drilling Date	0.00	-0.75	-2.10	0.00	0.00	0.00
Rotation Position	0.00	-2.14	-3.61	0.00	0.00	0.00
Oilseed Rape Frequency	0.00	0.00	0.00	-0.12	0.00	-0.12
Preceding Break Crop	0.00	0.00	0.00	0.00	0.00	0.00

Impact of mid and late drilling dates

Impact of shallow non inversion tillage on OSR yield compared to ploughing

2nd and 3rd wheat yield reduction

Yield decline in OSR with shorter rotation



Plant Science into Practice



Thank you