Catch and cover crops seminar

Strategic Farm Week - Winter 2020 Webinar

Brian Barker, Rob Fox, Kate Smith and Teresa Meadows

Housekeeping

@AHDB_Cereals
#strategicfarm
#SFWeekWinter2020

Strategic Farm Week – Winter 2020

ahdb.org.uk/sfweek-winter-2020

BASIS/NRoSO Points

Name; BASIS Account No; Postcode

Name; NRoSO Member No; Date of Birth; Postcode

Format

09:10 – 09:25

Brian Barker and Rob Fox

EJ Barker and Sons & Strategic Farm East Host // Squab Hall Farm & Strategic Farm West Host

Introduction to the cover crop (East) and catch crop (West) trials

09:25 – 09:50

Kate Smith

ADAS Research Scientist

Harvest 2020 research results and lessons learnt

09:50 – 10:20

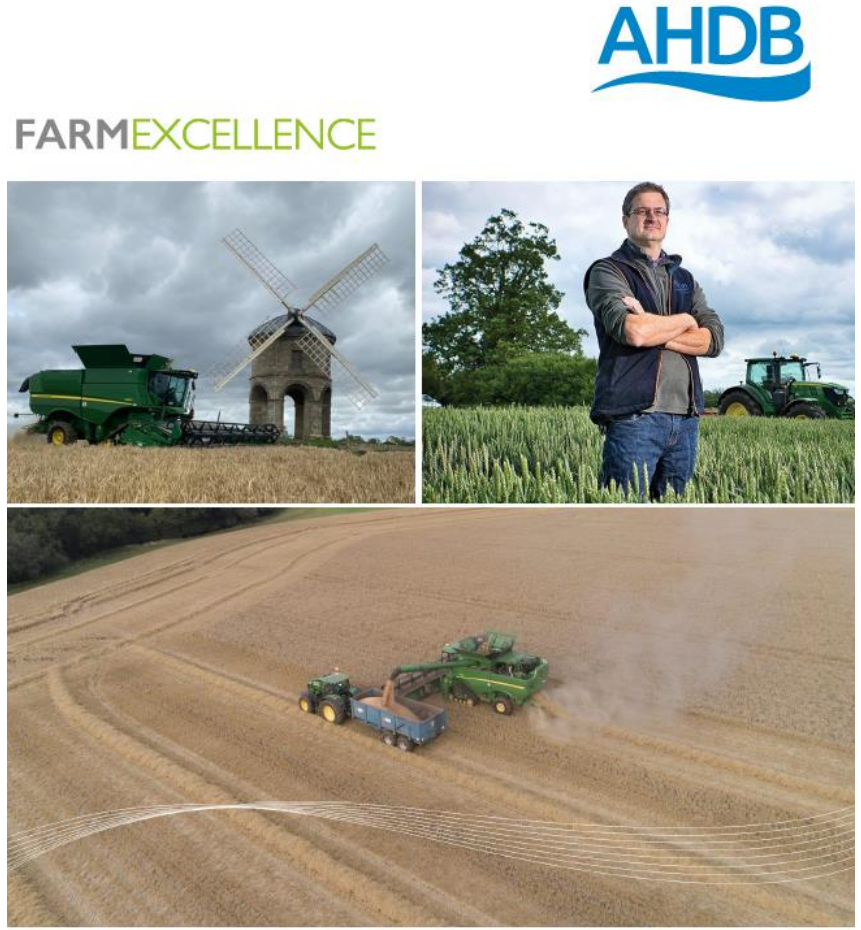
Panel discussion and questions from the floor

Your host…

Teresa Meadows

Knowledge Exchange Manager (East Anglia)

Handouts



April 2020

AHDB
CEREALS & OILSEEDS

Project Report No. 620

Maxi Cover Crop:
Maximising the benefits from cover crops through species selection and crop management

Bhogal, A.[1], White, C.[1] and Morris, N[2]

[1]ADAS Gleadthorpe, Meden Vale, Mansfield, Nottinghamshire NG20 9PD
[2]NIAB, Morley Business Centre, Morley, Wymondham, Norfolk NR18 9DF

This is the final report of a 38-month project (21140009) that started in August 2016. The work was funded by Amazone Ltd, Cousins of Emneth Ltd, Hutchinsons, RAGT seeds and a contract for £230,000 from AHDB.

Session objective

Use the **Strategic Farm results** regarding cover and catch crops to try on-farm, improve existing use or look into further research.

Q: What would you like to know by the end of this session?

Introduction to the cover crop (East) and catch crop (West) trials

Brian Barker, EJ Barker and Sons and Strategic Farm East Host

Rob Fox, Squab Hall Farm and Strategic Farm West Host

E. J. Barker & Sons
Lodge Farm, Westhorpe

‘Dabbling with cover crops’

Cover crops

"Very much a love hate relationship; long term see all the benefits, short term adds risk to my crops and profit."




- Water protection through nutrient absorption.
- Finding a mix of species we think work for us.
- Opens the door for livestock back into an arable business.

CC - Soil Management

"A recent change of farming system has been invested in looking long term with a more regenerative system to benefit soil."




- A change/reprogramming of our soil management; Less is more!
- Carbon capture and looking to NET Zero
- Earthworm, ground beetles and predatory spiders numbers increasing.

CC - Crop health and Protection

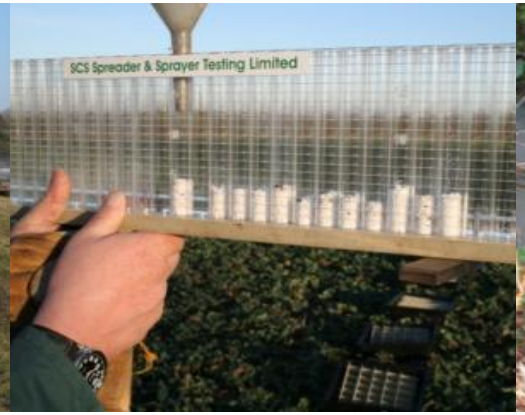
"Actually cause more problems than they solve. Cover crops add risk and now are only used in front of late sown spring crops like Linseed or Mustard"




- Damp soil after destruction has caused slug problems
- Blackgrass seems to be delayed in some scenarios
- Big biomass can be tricky to kill and can require more pesticides to control

CC - Water & Pollution Control

"Without any doubt cover crops will be a part of future farm policy due to capture of leaching nutrients and prevention of run-off."



- Nitrate absorption is clear in drain outlet testing
- Run off reduced where soil is covered and have living roots
- But do the captured nutrients become available after destruction?

Landscape & Nature

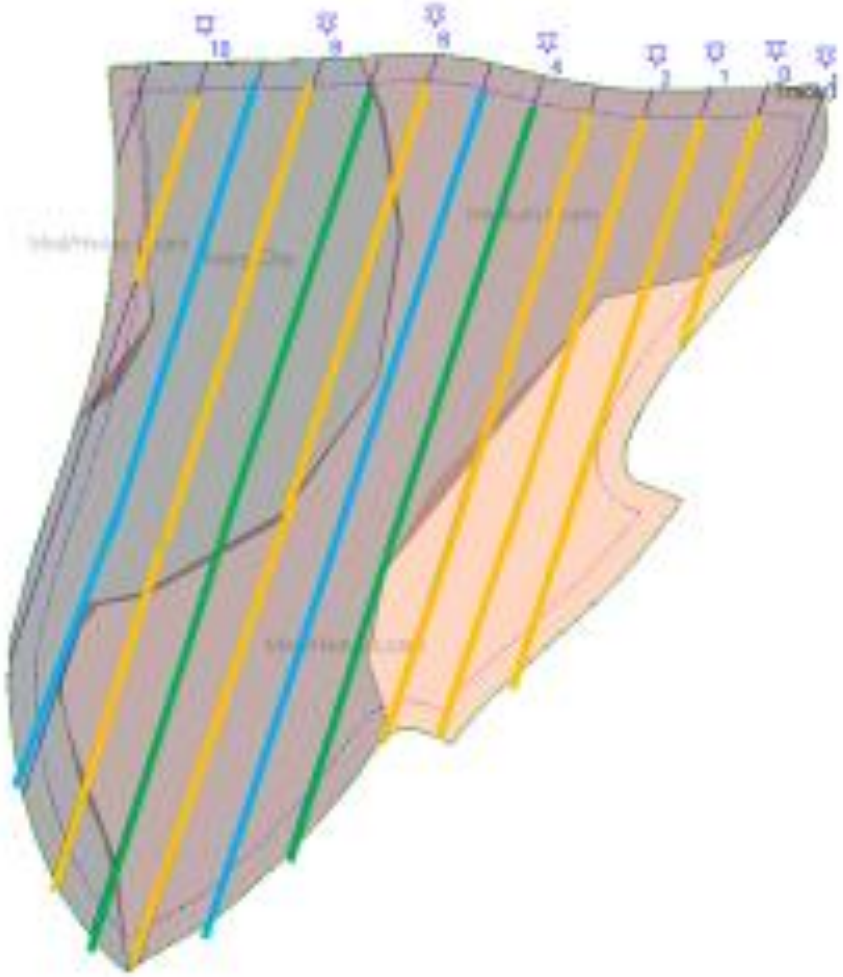
"Green cover of any kind has huge unmeasured benefits towards farmland biodiversity, providing late nectar source, cover from predators at a time when huge areas of fields are clear or brown."

- Grey Partridge, Snipe, Yellowhammers, Hares, Deer all enjoy them.
- IPM benefits with huge insect communities in them from start to finish.
- "Just feels right to have green field and to brown soil"

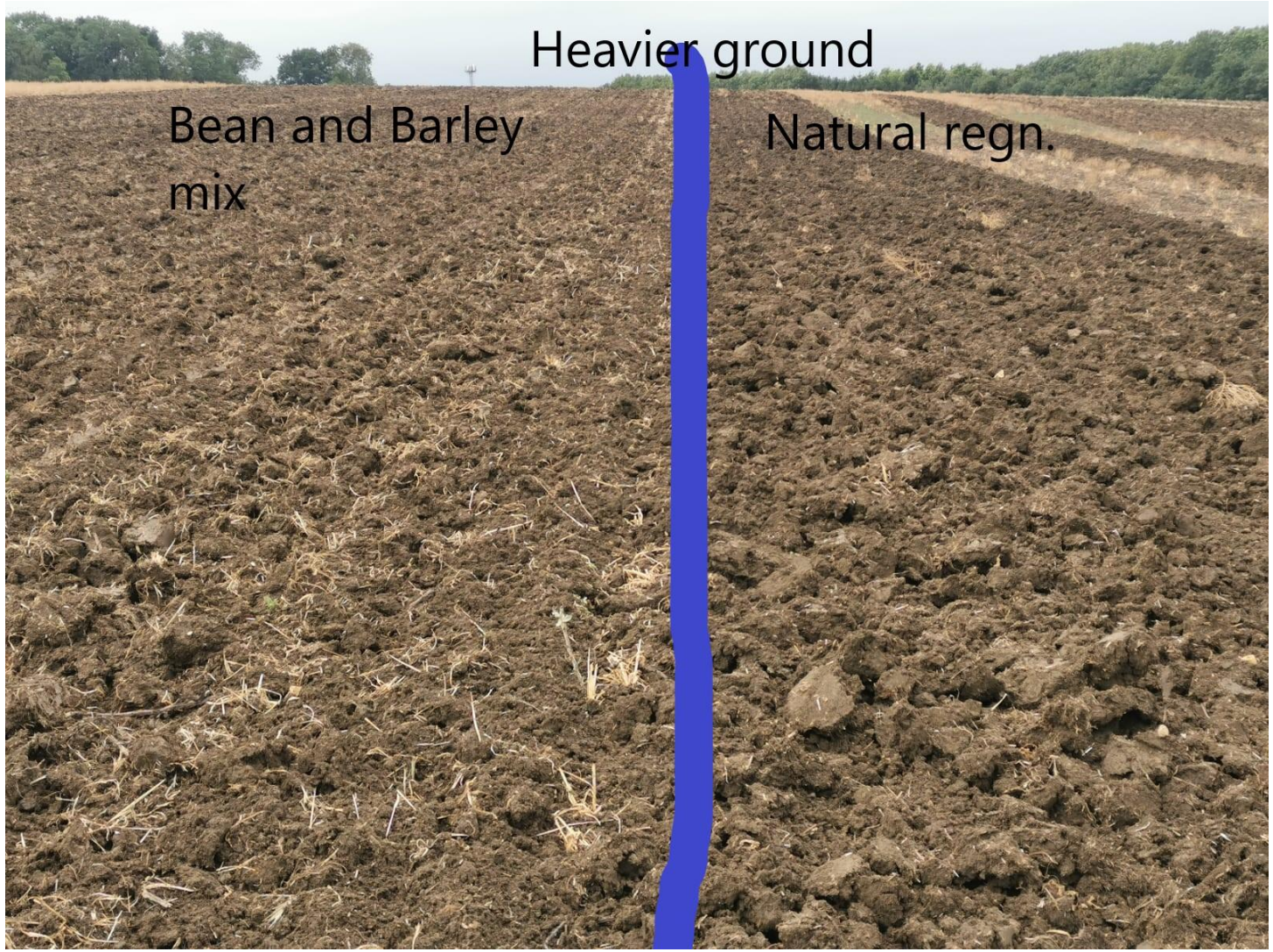
Summer catch crop trial background

Rob Fox, Squab Hall Farm and Strategic Farm West Host

Trial design

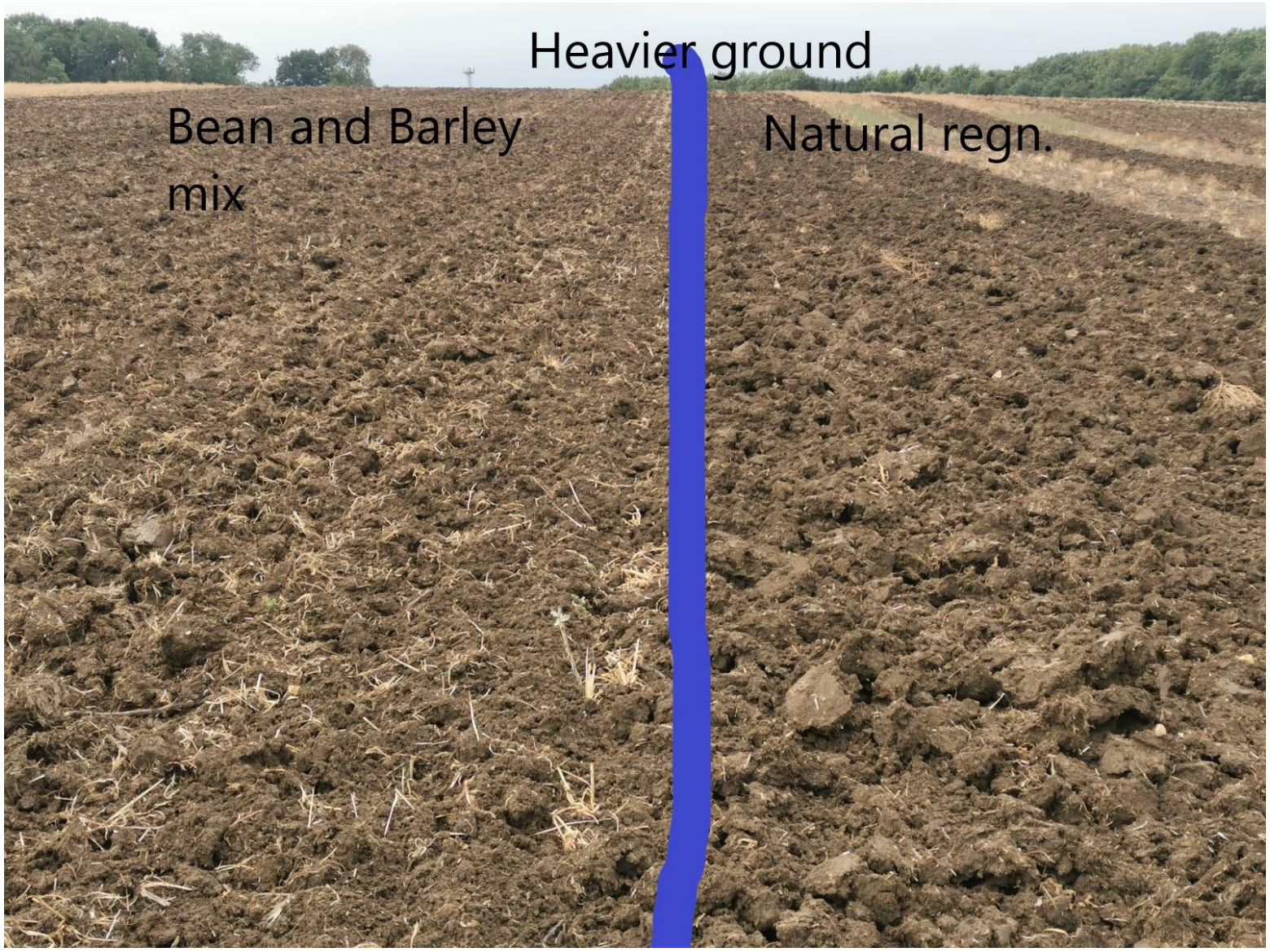


Summer catch crop trial



Summer catch crop trial

Summer catch crop trial



Catch and Cover Crop Trial Results Strategic Farm Week – Winter 2020

Kate Smith, Research Scientist, ADAS

Anne Bhogal, Sam Kendall, Leroy Nyamayaro, Mark Ramsden & Damian Hatley

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Introduction

Results from 2 demonstrations:

1. Summer catch crop - Strategic Farm West
2. Cover crop - Strategic Farm East

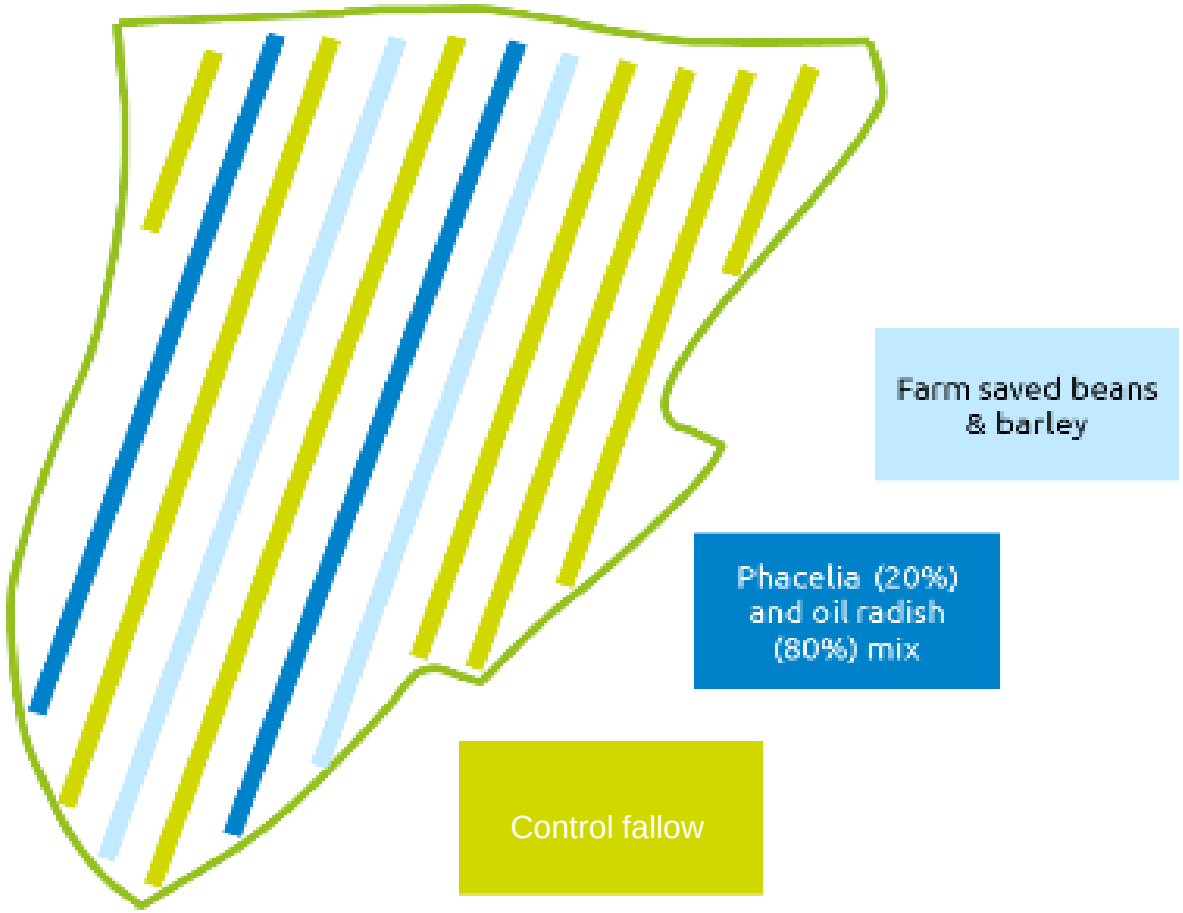
- *Summer Catch crop* - where not been possible to establish a cash crop, to capture useful amounts of nitrogen
  In this study: drilled May & destroyed July 2020
- *Cover crop* – *provides soil cover* post-harvest over-winter, *to capture nitrogen & reduce nitrate leaching losses* EFA retained

Catch Crop SFW, Objective:

To assess the impact of a summer catch crop on soil nitrogen supply, soil structure and the performance of the following crop in the rotation.

Catch Crop SFW: Trial Design

Summer catch crop
Weedy fallow (control)
Farm standard (barley @ 145 kg/ha & beans @ 225 kg/ha)
Commercial mix (designed for soil structure & nutrient retention): Phacelia (20%) and Oil radish (80%) @ 15 kg/ha



Monitoring 2 replicate tramlines of each treatment


Beans/Barley


Phacelia/Oil Radish

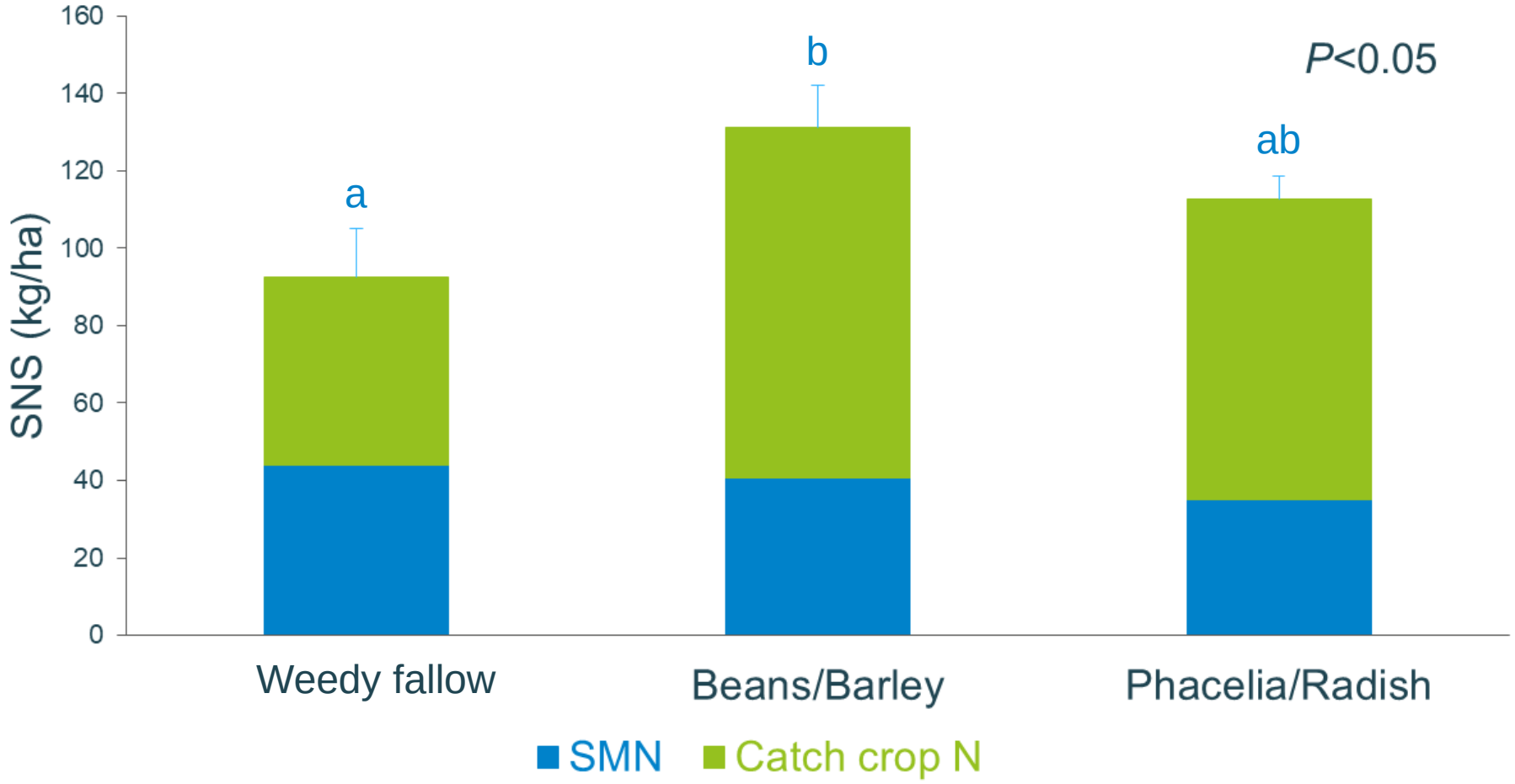

Weedy fallow Control

Catch Crop Performance

Treatment	% Cover*	Dry matter production (t/ha)	Total N uptake (kg/ha)*
Weedy fallow control	70[a]	1.9	49[a]
Beans/Barley	93[b]	2.7	91[b]
Phacelia/Radish	88[b]	2.5	78[b]

*Statistical differences ($P<0.05$) between treatments where means followed by different letters

Soil Nitrogen Supply



Different letters above bars indicates differences(*P*<0.05) between treatments

Cover Crop SFE, Objective:

To determine the role of cover crops in reducing nitrate leaching losses, impacts on soil structure, and spring crop yields

Cover Crop Treatments & Demonstration Design

	Field 1 – Appletree	Field 2 – Blacksmiths
Area:	10.1 ha	7.3 ha
2019 harvest crop:	Winter wheat	
Treatments: Drilled: 28/08/2019 (Apple tree) and 24/08/2019 (Blacksmith) Destroyed: 13/3/20 (using Glyphosate)	Treatment 1: Plough – soil left bare over-winter	Treatment 3: Over-winter Stubble
	Treatment 2: Rye (32%), Buckwheat (40%), Phacelia (8%), Oil Radish (8%,) Sunflowers (12%), drilled at 20kg/ha Established into ploughed soil	Treatment 4: Rye (32%), Buckwheat (40%), Phacelia (8%), Oil Radish (8%), Sunflowers (12%), drilled at 20kg/ha Established in one pass system into stubble
2020 harvest crop:	Spring barley (drilled 28 March 2020), under-sown with herbage grass	

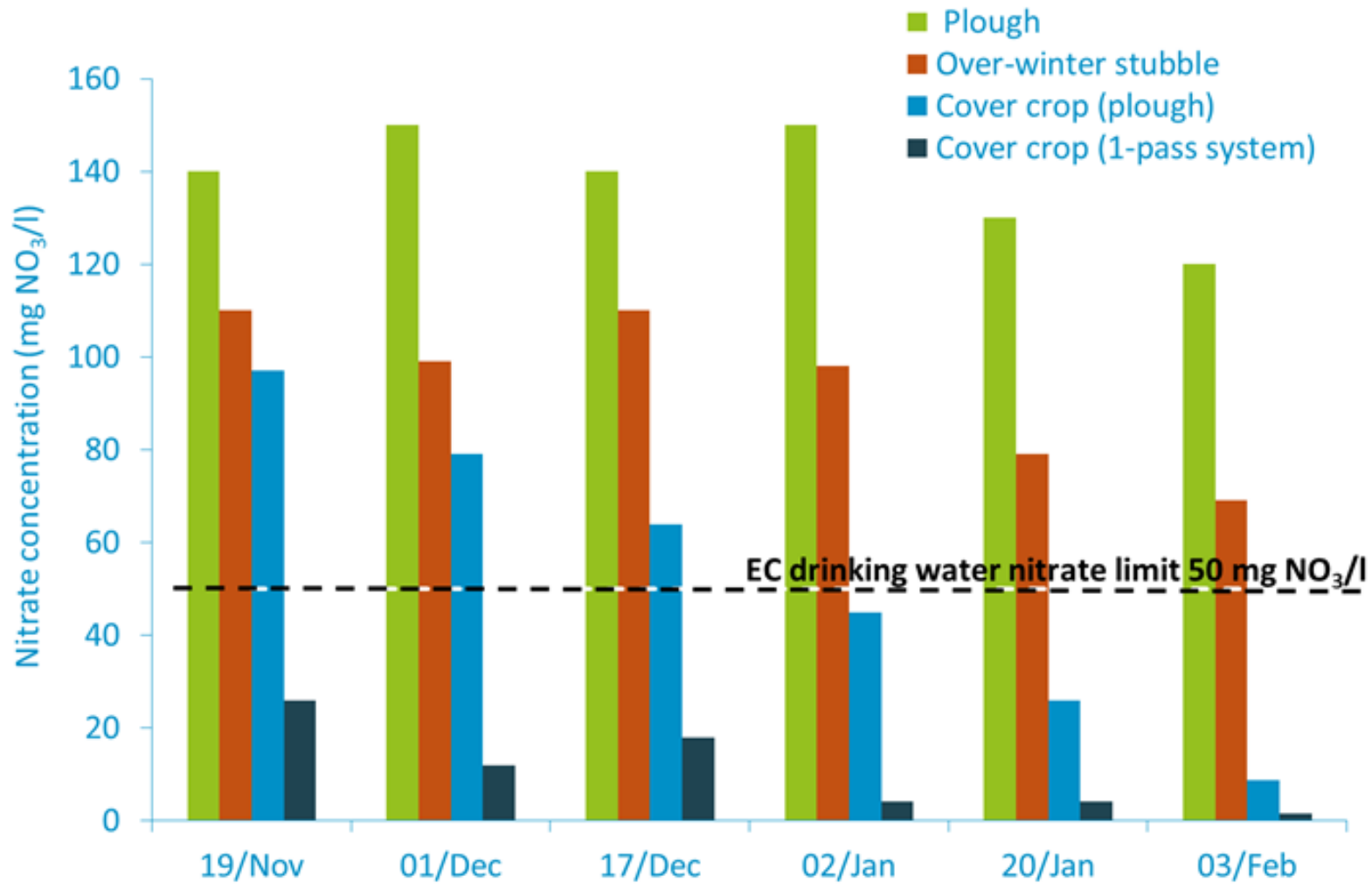
- Two field sites, each testing a different CC establishment method
- Three sampling zones per treatment

Cover Crop Establishment

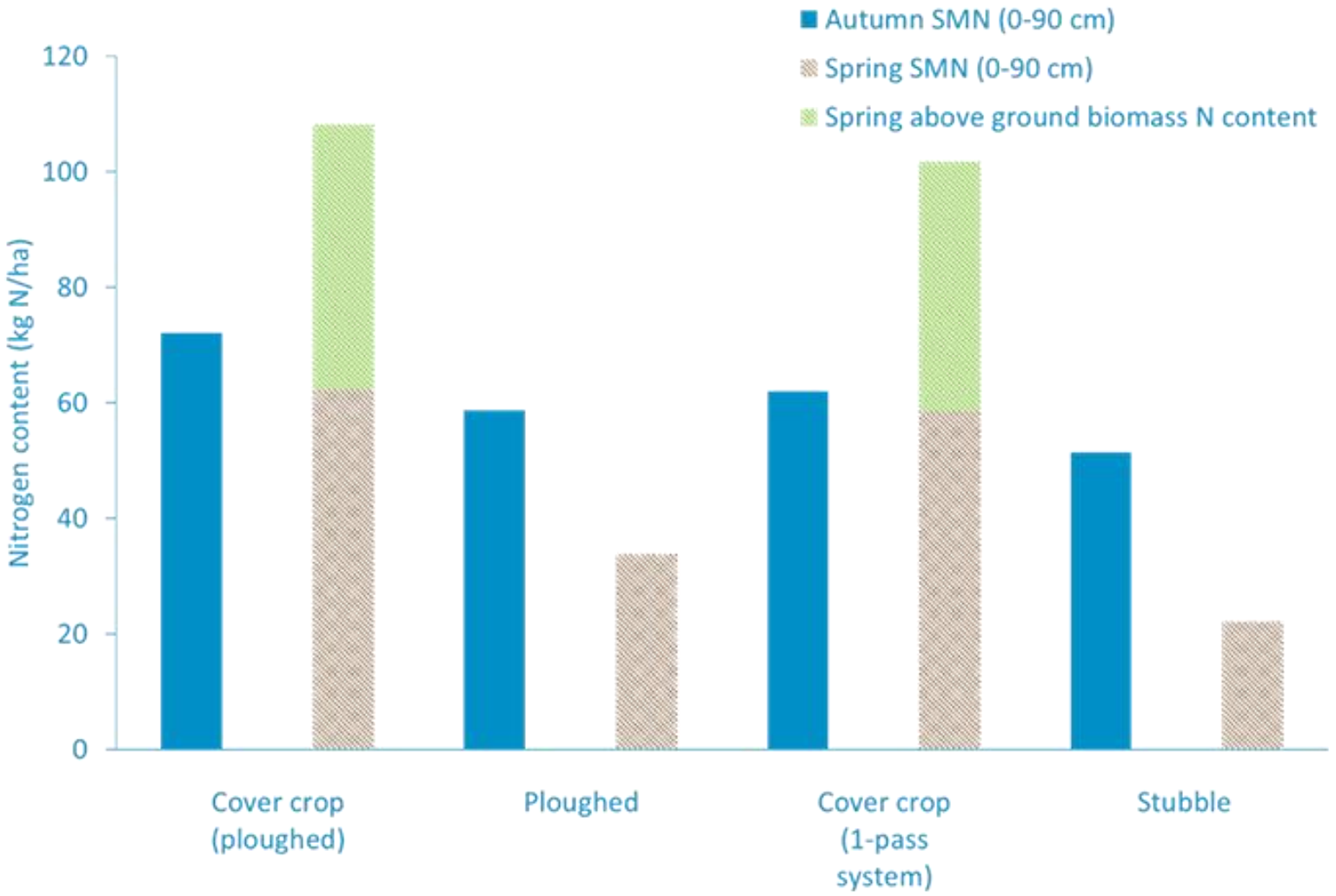
Photos taken 2nd December 2019

By February 2020, cover crops had produced similar amounts of biomass
at 1.4 t/ha (ploughed) and 1.6 t/ha (one-pass system) taking up around 45 kg N/ha

Drainage water nitrate concentrations from November to February 2019/20



Autumn & Spring Soil Nitrogen Supply

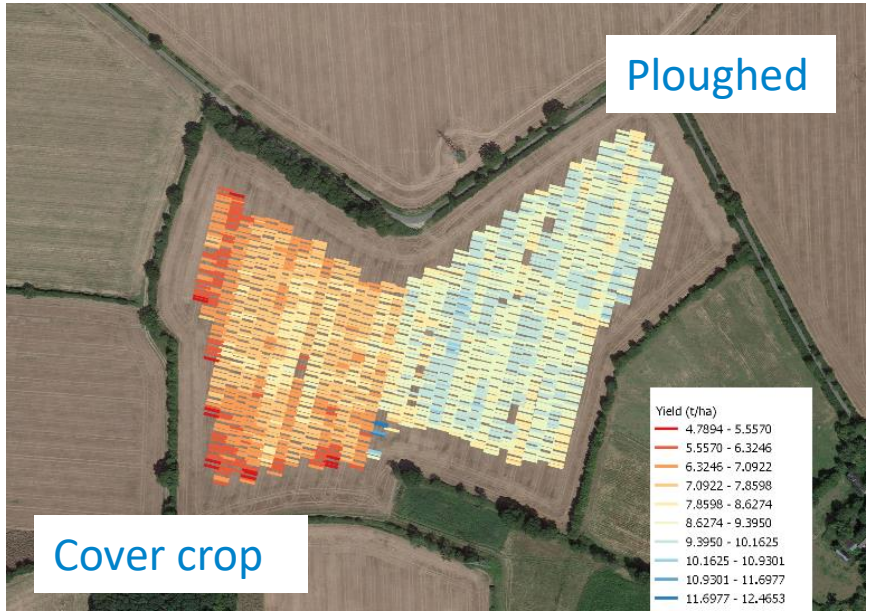


Cover crop N-uptake
c.45 kg N/ha

Cover crop
Spring vs. Autumn SNS
25-30 kg N/ ha greater

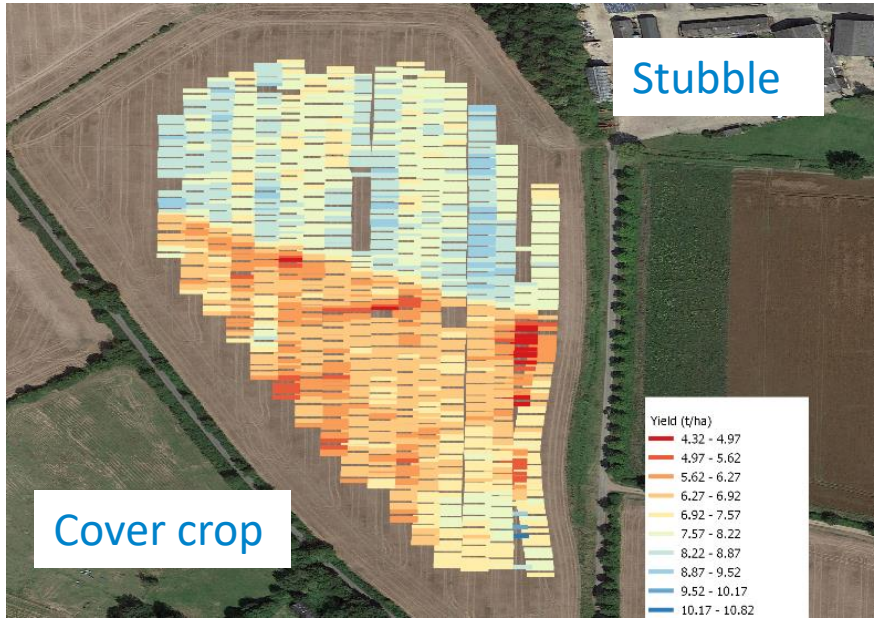
Spring Crop Yield Analysis

Appletree



Cover crop area was *c.*2 t/ha lower
(95% CI= ± 0.24 t/ha) than ploughed at 8.1 t/ha

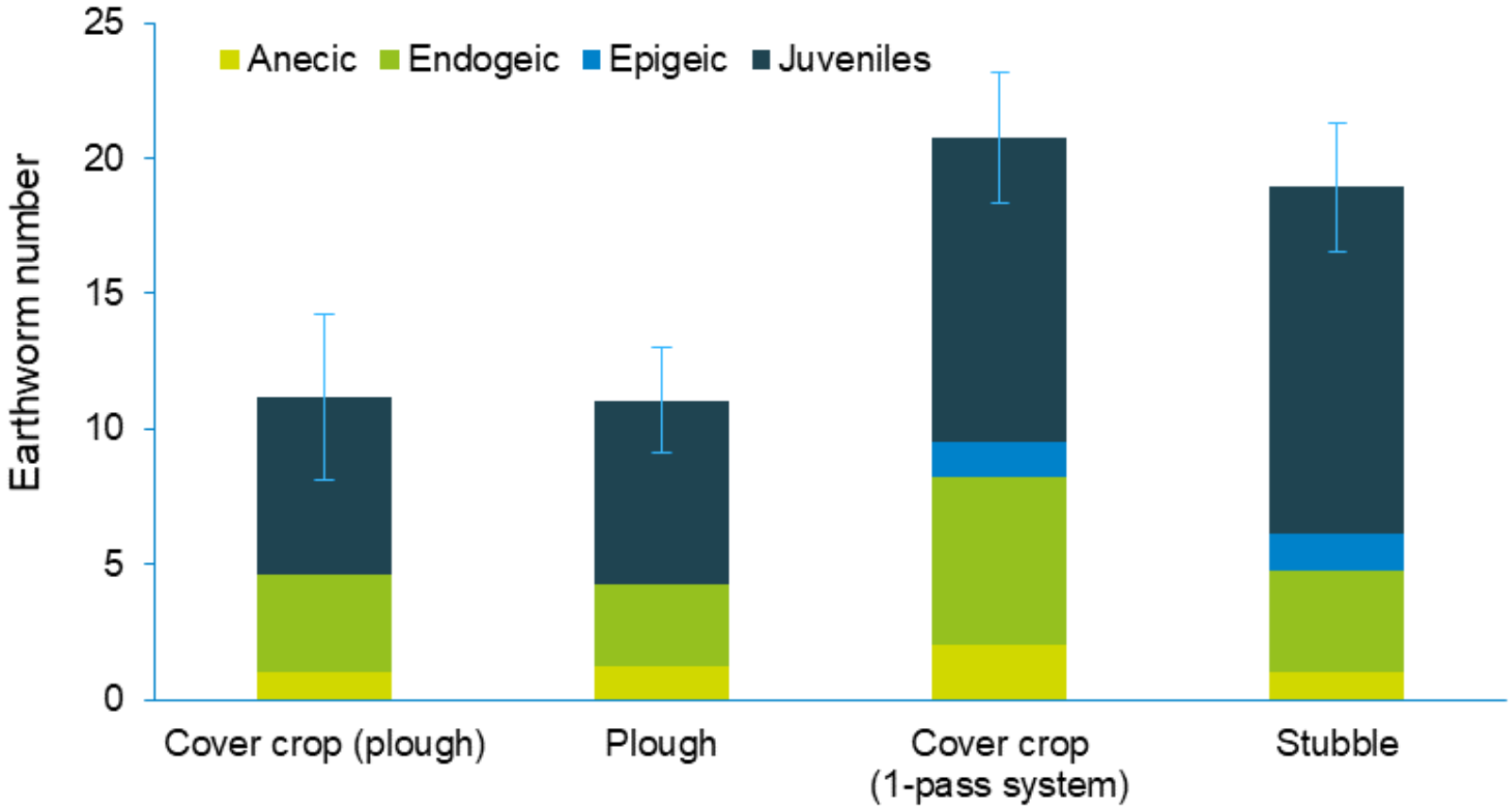
Blacksmiths



Cover crop area at 6.6 t/ha was *c.*1.7t/ha lower
(95% CI = ± 0.37 t/ha) than stubble at 8.3 t/ha

*c.*2t/ha Yield reductions following cover crops result of poor spring crop establishment combination of pest damage and ploughing/drilling in wet soil conditions.

Earthworm Assessments



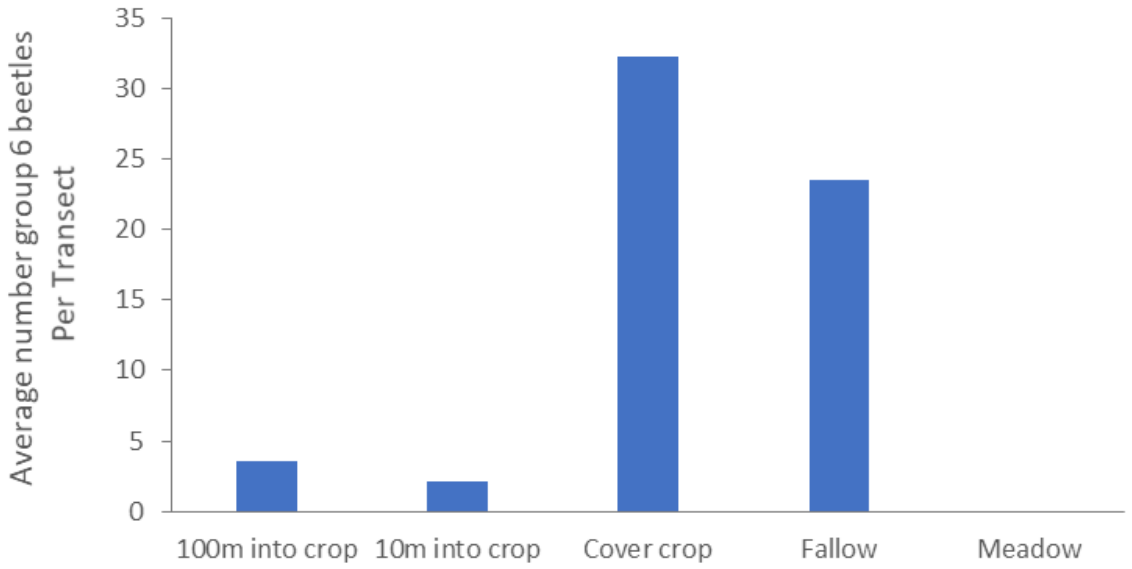
AHDB Scorecard 'Good' number of earthworms across both sites

Difference between fields due to cultivation – ploughing disturbing burrows and reducing surface trash

Assessed February 2020

Pests and Natural Enemies

- In cover crop - higher number of ground beetles (Functional Group 6) compared to stubble/plough treatments
- Dense habitat for prey – cover crops may provide important habitat to promote across farm



Representative Species

Trechus obtusus

Small: 3 to 10 mm (in length)
Generalist predators
Consume eggs and small predators
Important contributions to pest suppression

Summary and Next Steps…

Catch crop demonstration

- Consider growing catch crops when weather and soil conditions prevent crop establishment
- Catch crops provide more consistent ground cover & can take up useful amounts of nitrogen – compared to leaving fallow

Cover crop demonstration

- Cover crop reduced drainage water nitrate concentrations
- Increase in natural enemies (functional group 6) in cover crop
- Reduction in crop yields following cover crop - pest damage & ploughing/ drilling in wet soils

Harvest 2021 – assess soil structure, soil nitrogen supply and crop yields

Thank you for listening
Discussion and Questions

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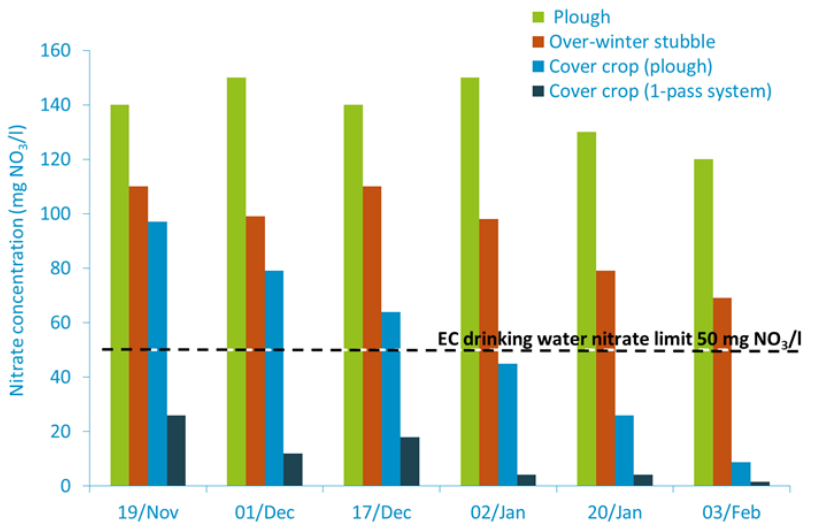
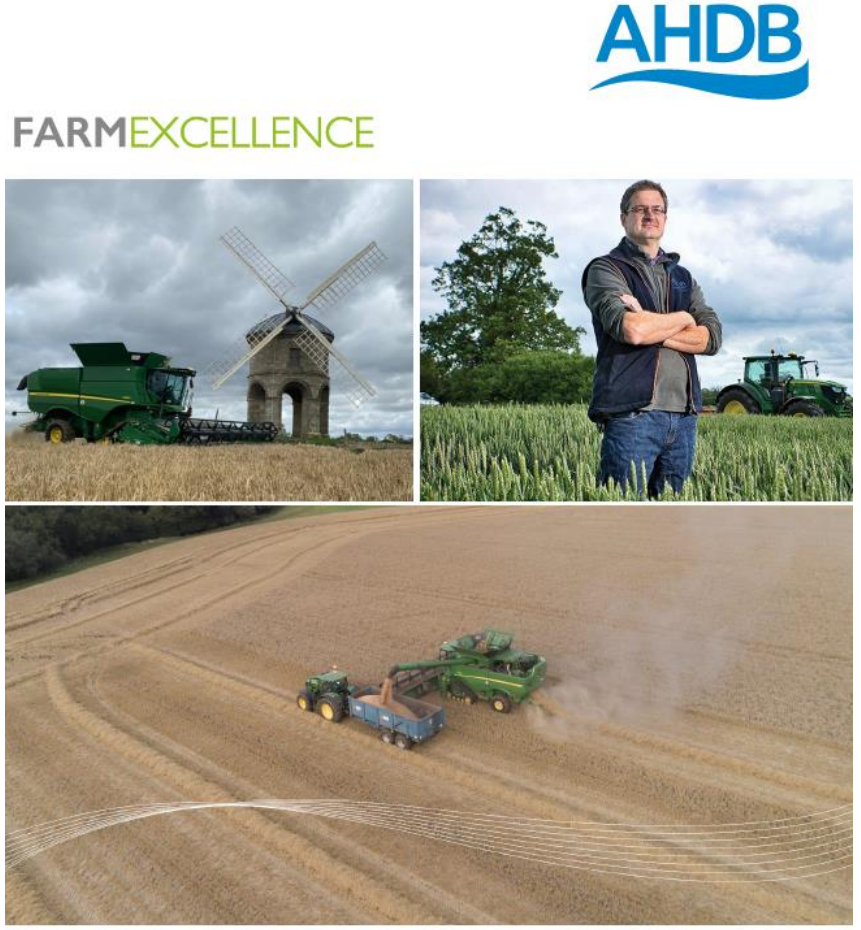
Questions and Discussion



Further information

Resources



ahdb.org.uk/sfweek-winter-2020/results

Resources

- Maxi cover crop project – report, summary and articles
- https://ahdb.org.uk/cover-crops
- Farmer experiences
- Amanda Bennett, AHDB
- Opportunities for cover crops in arable rotations publication

The publication

With a focus on several cover crop species – brassicas (mustards, radishes and turnips), legumes (vetch and clovers), and grasses and cereals (oats, rye and ryegrass) – our cover crops publication describes agronomic and environmental benefits, as well as agronomic considerations.

The review

Our nine-month review, by ADAS and NIAB TAG, provides the most comprehensive analysis of cover crops to date and acts as a practical reference source to aid with cover crop species selection and management.

The research

Our cover crops research project quantified the effects of cover crops, as straights and mixtures, and assessed the impact of cultivation, establishment and destruction techniques.

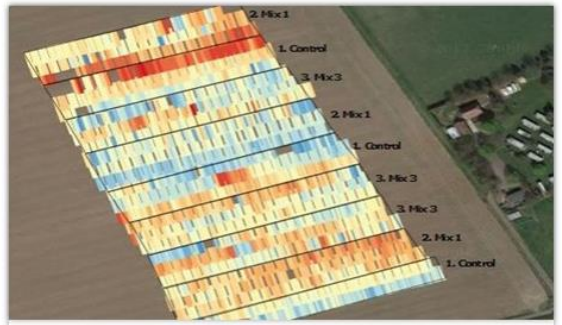
The experiences

These publications feature farmers talking about their experiences using cover crops. They have grown cover crops for a variety of reasons, such as improving soil structure, nutrient capture and overall sustainability improvements. By sharing farmers' experiences, we want to help you select the best cover crop, or species mix, for your farm.

1. Peter Cartwright – Cover crops for improved soil health
2. Richard Reed – Cover crops for improved soil health
3. David Blacker – Cover crops for improved soil structure
4. Phil Jarvis – Cover crops, drainage and targeted cultivaton for improved soil

A clearer course for cover crops

An article from Crop Production Magazine



Maxi Cover Crop research

Find out how cover crops (straights and mixtures) influence cash crop gross margins

Strategic Farm Week – Winter 2020

Watch Strategic Farm research videos

Take part in the webinars

Listen to the podcast special

Download the harvest report and ‘how to’ resources

All at: ahdb.org.uk/sfweek-winter-2020

Coming up…

Strategic Farm Week:

- ✓3pm – Weed management
- ✓ 7pm, Wed – Managed lower inputs, Part II
- ✓ 9am, Thurs – Flowering strips
- ✓ 9am, Fri – Ask the researcher

Wider AHDB:

- Monitor Farm Mondays
- Agronomy week
- Regional and technical events

Info and register at: ahdb.org.uk/events

Could you be a Strategic Cereal Farm host 2021-2027?

- Are you an ambitious arable farm/enterprise in the following counties?
  - Yorkshire
  - Lancashire
  - Dorset
  - Gloucestershire
  - Wiltshire
  - Hampshire
  - Oxfordshire
- Do you want to test and show case research, share technical and financial performance and have ambitions to advance your business and personal development?

Applications open Monday 23 November 2020
ahdb.org.uk/farm-excellence/recruitment
Any questions? Email: Natalie.Gilbert@ahdb.org.uk

Thank you

REC

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