

Grazing on the North Wyke Farm Platform

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<http://www.rothamsted.ac.uk/farmplatform>
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Three approaches to sustainable grassland management:

- Permanent grassland
- Increased use of legumes
- Planned reseeding



Management on each farmlet



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Beef and sheep - continuously stocked

- 75 ewes and their lambs
- 30 yearling beef cattle



First silage cut (late May/early June)

Second silage cut (July/August)

FYM applied after cutting





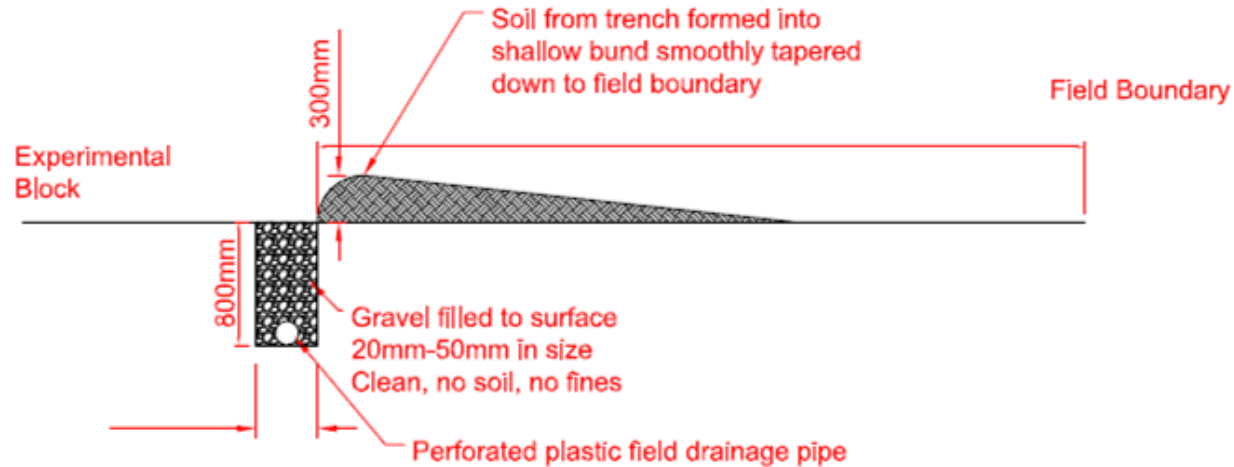
Grassland systems can be designed and managed to deliver optimal sustainable production per unit area, whilst minimising negative impacts on other ecosystem services.

Our vision is to make the Farm Platform a globally recognised model for systems research in sustainable food and farming.

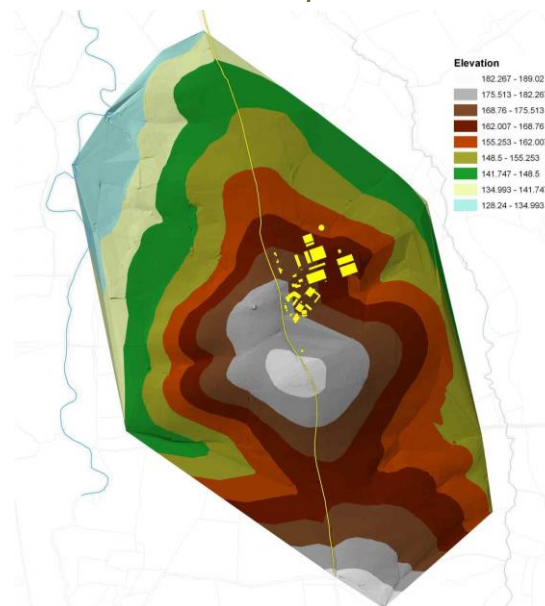
Topography and hydrology



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- slightly stony clay loam topsoil (36% clay)
- impervious mottled stony clay (60% clay)

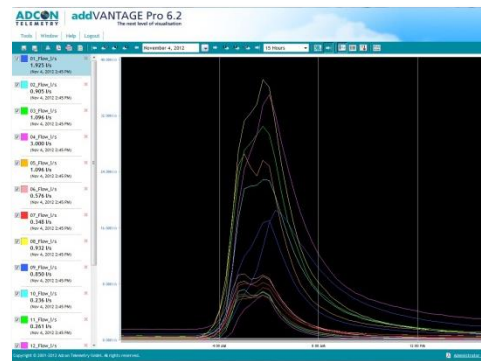


Soil Atmosphere Farm Management

% Moisture
Temperature
pH
Bulk density
N, P & C status

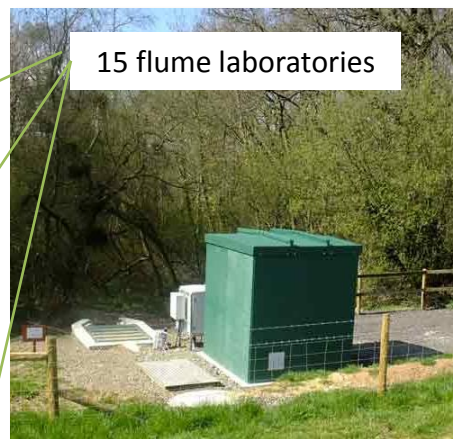
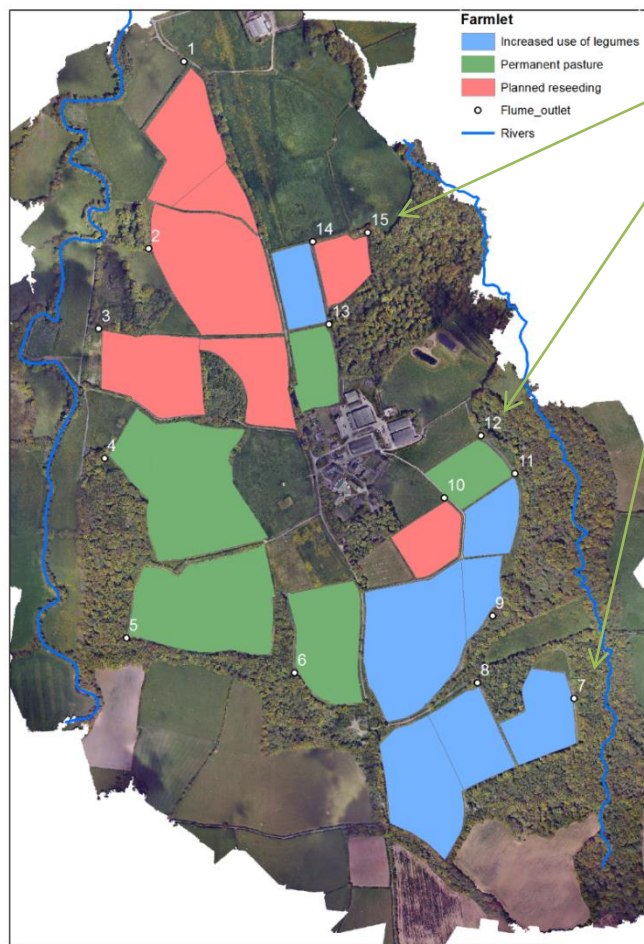
Rainfall
CO₂ and N₂O

Field inputs/outputs
Liveweight gain
Farm activities
Labour hours
Machine hours



Water

Temperature
Conductivity
Turbidity
pH
Dissolved O₂
Ammonium
Nitrate
Dissolved organic C



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Other instruments



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- 15 soil moisture stations: Precipitation, Soil temp (15 cm), Soil moisture (10, 20 & 30 cm)
- Met site: Air temp, RH, Wind speed and direction, solar radiation, ETo
- 3 automated gas sampling systems: CO_2 and N_2O



Other instruments

3 Eddy Covariance towers; 1 in each farmlet

Measure carbon dioxide, water vapour (evapotranspiration) and energy flux at each tower
(Plus one roving methane flux unit)



Other instruments



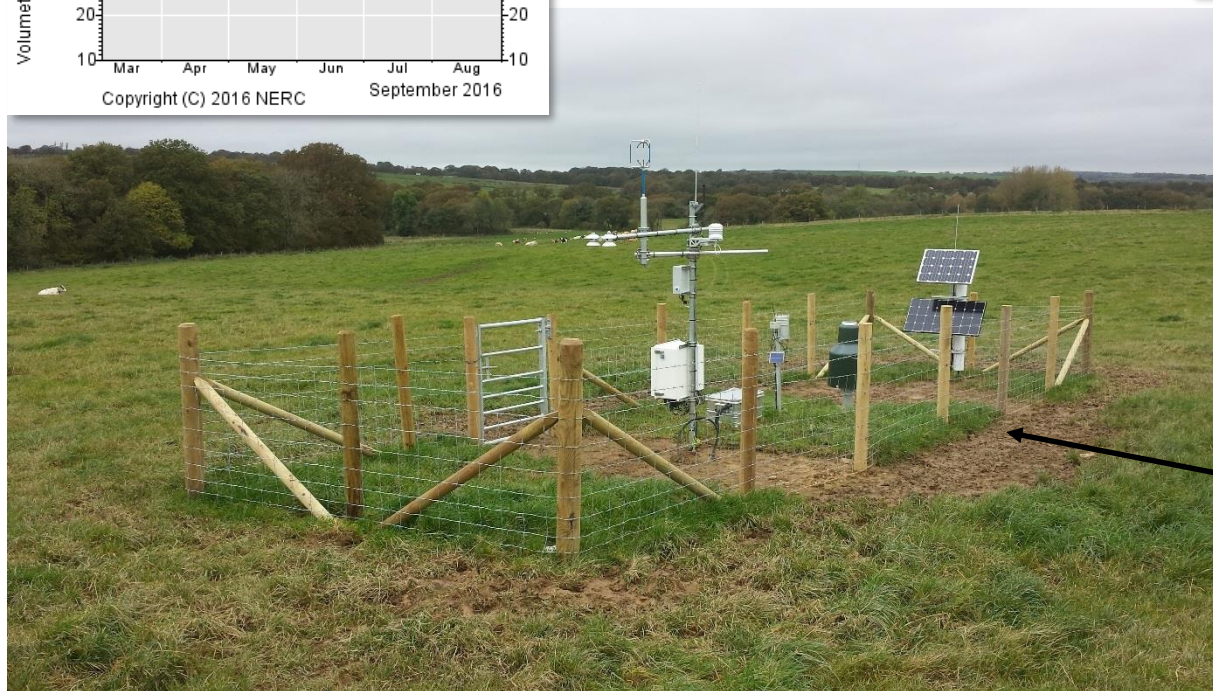
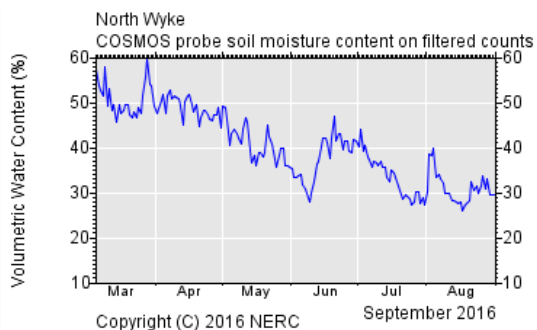
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COSMOS-UK

UK Soil Moisture Monitoring Network



COsmic-ray Soil Moisture Observing System UK



Dedicated cattle housing, silage clamps & FYM middens for each farmlet



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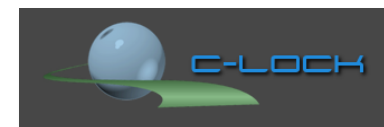
Dedicated GreenFeed units for each farmlet



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GreenFeed – Large Animals



Measure methane and carbon dioxide fluxes

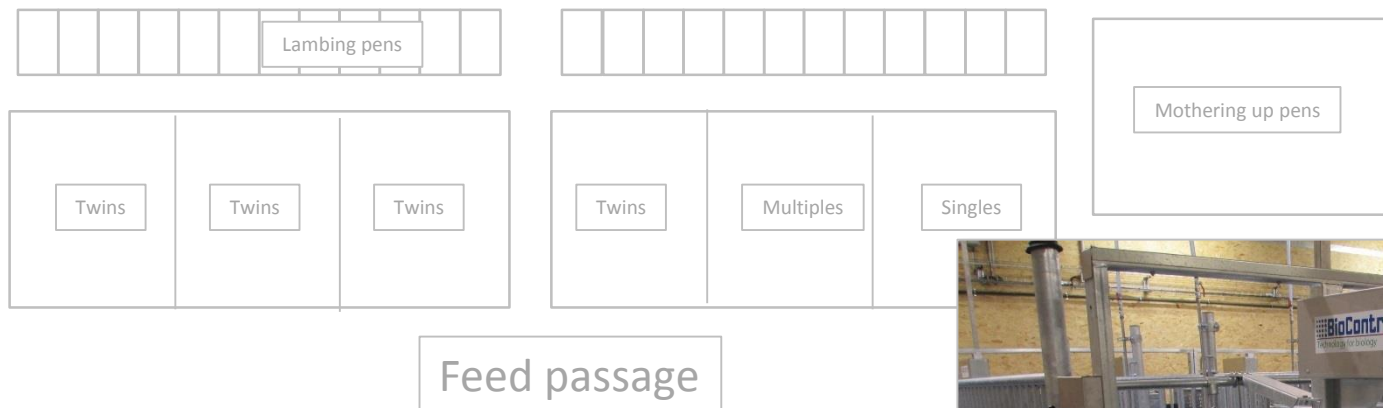


System offers a small amount of pelletized bait attractant to entice the animals to visit multiple times per day

To be built 2016/2017 – dedicated sheep housing for each farmlet, with CRFI (Controlling and Recording Feed Intake) system



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Mickael Bernard (INRA Theix)



Mickael Bernard (INRA Theix)



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Sustainability metrics for beef and sheep

Criteria	Measure	Units	Permanent pasture
Animal performance	Liveweight gain from weaning to sale	(kg per day)	0.75 (cattle) 0.165 (lambs)
Annual carrying capacity	Animals per ha	(kg live weight per ha)	271 (cattle) 164 (ewes) 58 (lambs)
Nutritional provision	Human edible nutrients per ha	Energy (MJ ha ⁻¹) Protein (kg ha ⁻¹) Fat (kg ha ⁻¹) Omega-3 (kg ha ⁻¹) Vitamin B12 (mg ha ⁻¹) Haem iron (g ha ⁻¹)	4365 77.4 68.7 3.8 10.6 7.5

Lee et al. (2016) A farm platform approach to optimizing temperate grazing-livestock systems: metrics for trade-off assessments and future innovations. *Global Food Security* (submitted)



Fibre analyser

Cold extraction unit

- Crude fibre (CF)
- Neutral detergent fibre (NDF)
- amylase treated Neutral detergent fibre (aNDF)
- acid detergent fibre (ADF)
- acid detergent lignin (ADL)

Meat analysis at Langford



Analyse meat samples from
5 CHX steers per farmlet



- pH
- colour (shelf life)
- TBARS
- vitamin E
- total carotene in fat
- fatty acid
- texture (mechanical)
- sensory attributes



Farm Platform Data Portal



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**Farm Platform
Data Portal**

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Register and/or log in if you want to download data.

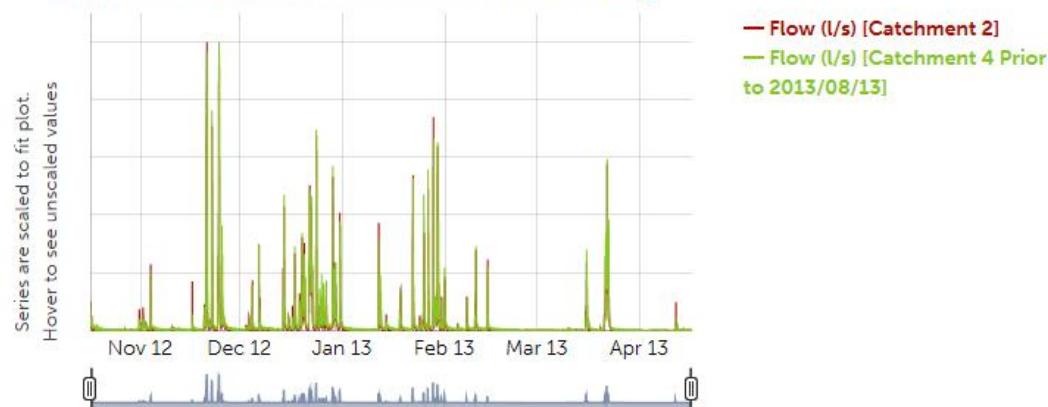
Click on the map below to select catchments



Start
Date 2012-10-17

End
Date 2013-09-17

Data Preview for 15 min time series data only



The above preview plot is restricted to 6 months of data from the selected start date and 5 individual series. ***This limitation does not apply to downloaded data.***

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