

The PROSOIL project 2009-2014

Heather McCalman
Grassland Development Centre



Cwmni Amcwybyddol Ewrop ar gyfer
Datblygu Gwledig: Ewrop yn Bwriadu
newydd Archwilio Gwledig
The European Agricultural Fund for
Rural Development: Europe Investing in
Rural Areas



Llywodraeth Cynulliad Cymru
Welsh Assembly Government

PROSOIL Aims

To develop producer-led co-operation to test and develop the concept :

optimising soil health can improve

1. Financial efficiency
2. Product quality



on livestock farms in Wales.

Introduction

Soil health



Forage quality



Livestock performance



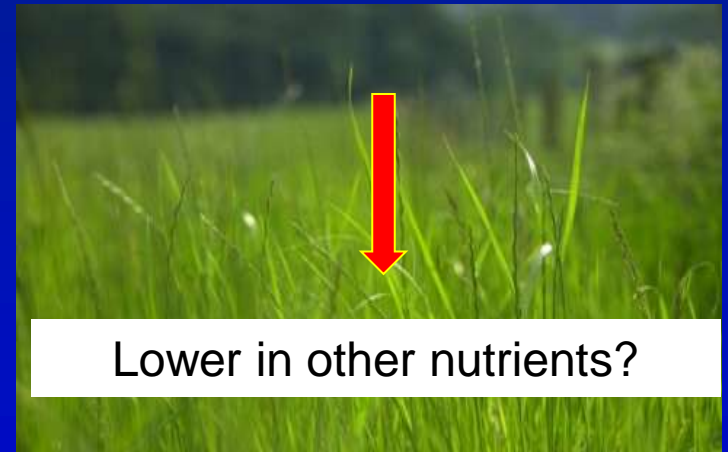
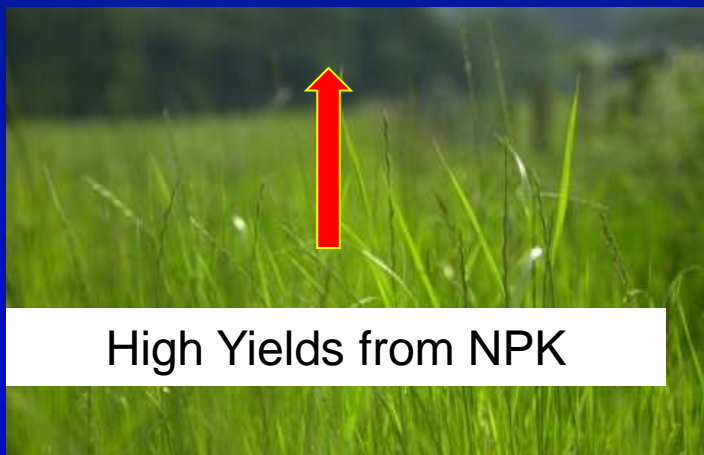
Product quality



Does the *quality* of agricultural products depend on the **health** of the soil?

Achieving Productivity & Product Quality

- Do modern agricultural systems (NPK) produce meat and dairy products with a balanced range of minerals, vitamins and trace elements ?



Introduction – soil nutrient analysis

1. Standard RB209 Guidelines

- ‘Sufficiency level’ – once you provide soil nutrients to correct index, plant growth will be maximal
- focus is mostly on NPK (+ lime)

2. Base Cation Saturation Ratio (BCSR)

- ‘Mineral balancing’ – once you balance the ratio of cation bases in the soil, uptake of nutrients by plants will be optimal
- focus is on soil ‘health’ – condition, biological activity

Soils are not just a sterile growing medium for plants

Project Objectives

1. To develop producer-led co-operation across Wales thinking about the importance of managing soils to optimise farm productivity.
2. To determine scientifically the impact of improving soil health on forage and livestock productivity and quality
3. To effectively disseminate key findings throughout the agricultural industry



Project Delivery – Phase 1

Objective 1

Years 1 - 5

Soil health



Forage quality



Objective 2

Years 1-3

Soil health

Forage quality



Years 4 -5

Livestock performance



Product quality



Objective 2

1. Plot scale experiment evaluating different approaches to improving soil health



2. Field-scale experiment comparing two soil management regimes



1.1 Plot-scale experiments: Effects of different approaches to improve soil health

Treatments include:

- Inorganic N (control)
- Aerated and non-aerated slurry
- Soil conditioner based on BCSR theory
- Gypsum
- Anaerobic biodigester residue
- Soil aeration



Approaches as across 8 commercial development farm sites

2. Field-scale experiments – effects of two soil management regimes

Treatments include:

1. Standard Soil Management (Control)

- soil analysis /amendment - focus on NPK (+ lime)
- based on RB209 guidelines

2. Alternative Soil Management (Alternative)

- soil analysis /amendment - considers all plant nutrients
- uses soil conditioner based on BCSR theory
- plots managed for high clover content

Soil 'Health' Measurements

a) Soil biology

- earthworms
- nematodes



b) Soil chemical composition

- N, P, K,
- Ca, Mg, K, Na, Al KCl, H, B,
Fe, Mn, Cu, Zn, Al, Se, Co

c) Soil physical assessments

- autumn each year



1.2 Forage measurements

a) Forage quality

- Protein, Energy, Fibre
- Minerals and trace elements

b) Forage Yield

Small plots

- Determined from material in 8 m x 1.5 m / plot

Field plots

- Silage cut yields
- Determined using quadrats cut pre and post cut/grazing





Improve our knowledge base- link to IBERS R & D

Reduce costs (fertiliser levels declining year on year)

Improve awareness of soil structure problems

Improve soil health and fertility



Commercial Development Farms

Geographic spread

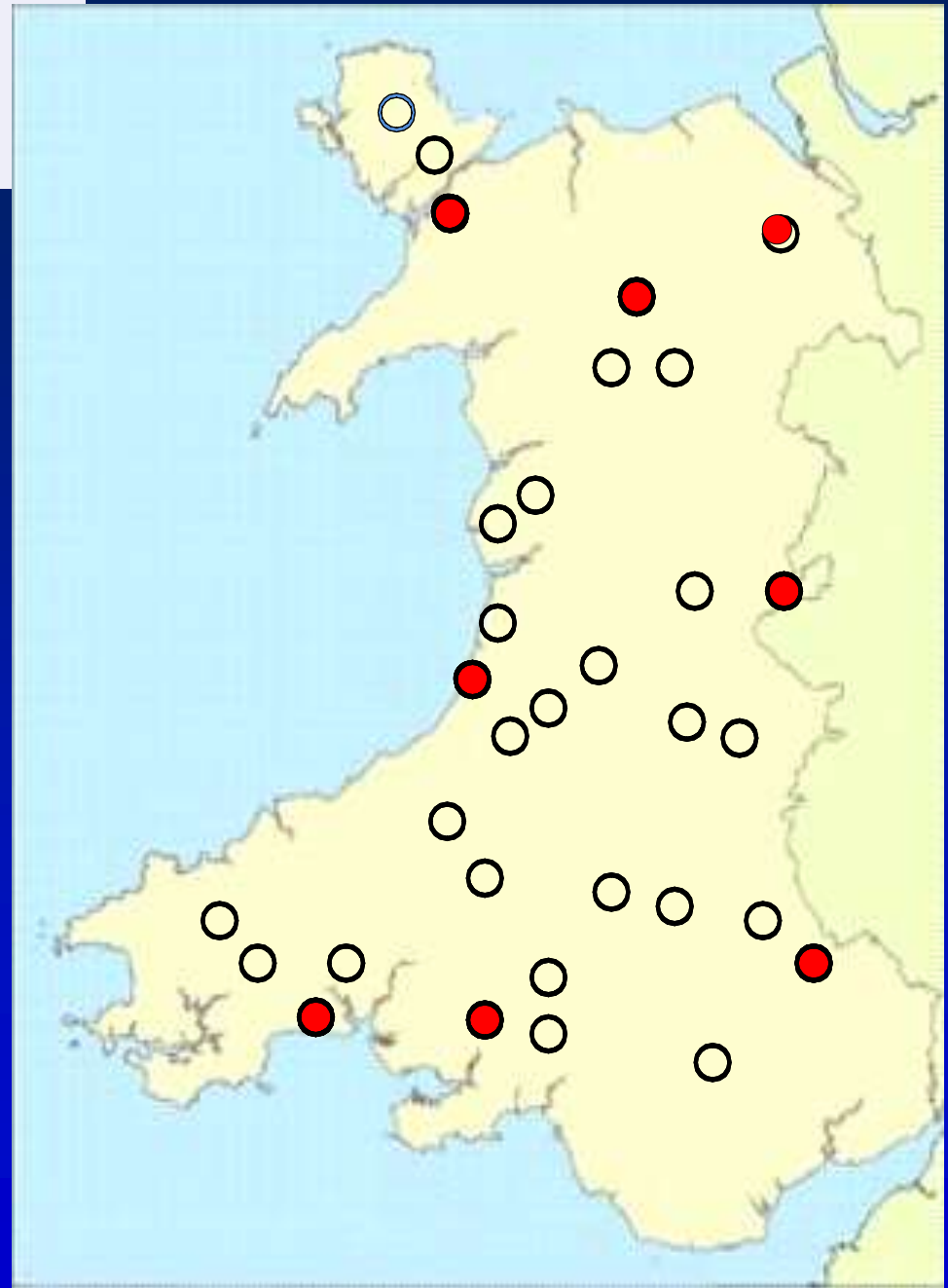
Upland/lowland

Intensive – extensive – organic

Light , medium and heavy soils

Key soil areas represented

Dairy, beef and sheep



Who are we?



Farmers role in the project



To work alongside 'controlled' field and plot studies

To promote and develop our interest and spread this to other farmers

To explore a wider range of conditions and management option than plot studies allow and in the context of a real farm system



Management options

Spiked aeration



Slurry -trailing shoe/aeration depth



Diverse sward



Digestate
(anaerobic)



Aerated and non
aerated slurry



Regular subsoiling





PROSOIL



Healthy soils are the true drivers of sustainable
and profitable agriculture

www.aber.ac.uk/prosoil

Any ideas for a snappier strapline??



Acknowledgements

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