SOIL NUTRIENT HEALTH SCHEME

afbi AGRI-FOOD & BIOSCIENCES INSTITUTE

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

cafre College of Agriculture, Food & Rural Enterprise

Background

The Soil Nutrient Health Scheme (SNHS) is a comprehensive regional soil sampling and analysis programme, that will enable Northern Ireland's farmers to optimise crop nutrient applications, assess on-farm carbon (C) stocks and build farm resilience. Simultaneously it is expected that the scheme will provide a baseline to develop strategies for improving the sustainability of the region-wide soil resource, agriculture, and the natural rural environment. The Department of Agriculture, Environment and Rural Affairs (DAERA) is funding the £45m scheme, which runs from 2022-26 and is managed by the Agri-Food and Biosciences Institute (AFBI).

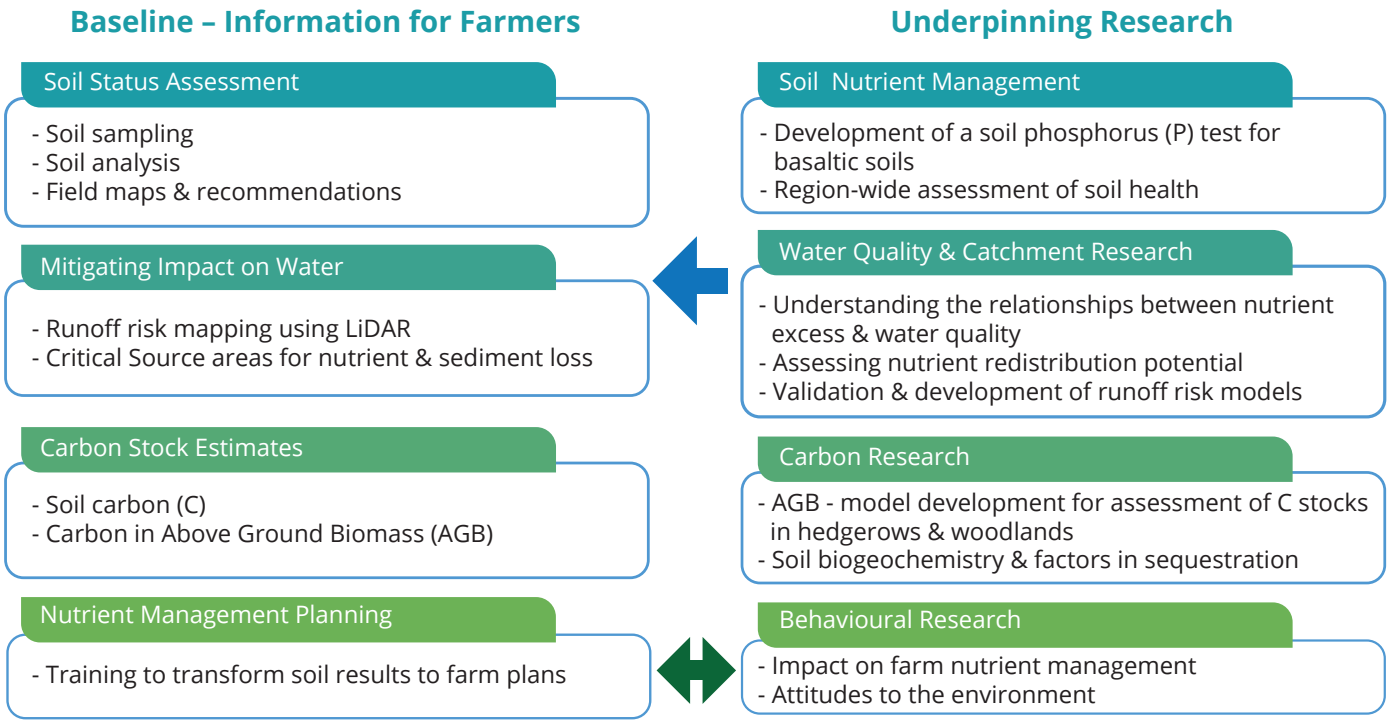
Benefits to Farmers

Comprehensive testing of all fields on each participating farm in SNHS will enable farmers to optimise the application of crop nutrients to their soils and help increase farm profitability.

Farmers participating in the scheme will receive:

1. Detailed information on the nutrient and pH status for each field, and crop-specific recommendations for the year of application
2. LiDAR-derived runoff risk maps highlighting sub-field scale hot-spots with potential for nutrient loss to waterbodies
3. Estimates of C stored in soils and as above ground biomass on each farm
4. Training on the interpretation of soil nutrient reports and generation of farm nutrient plans (provided by the College of Agriculture, Food and Rural Enterprise - CAFRE).

All work on the scheme is supported by a comprehensive programme of research led by AFBI and with partners at both Ulster and Leeds Universities.



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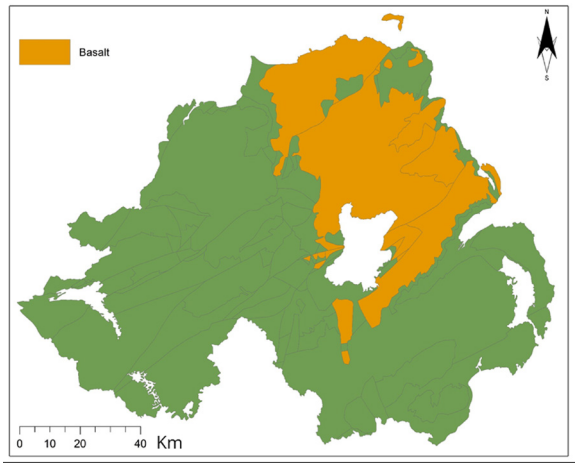
Ulster University

UNIVERSITY OF LEEDS

Soils Research

Basaltic soils cover nearly a third of the landscape of Northern Ireland and are characterised by high levels of Fe, Al, Ca, Mg, Cu, Cr and Ni. Research indicates that the Olsen P soil test, when applied to these soils, may be underestimating plant-available Phosphorus (P)

As a result, SNHS encompasses a body of research dedicated to assessing nutrient interactions and grass nutrient uptake specific and uniquely to these basalt soils through plot experiments on farms across the northeast. The soil test developed from this work will be used to provide recommendations to farmers when this area is soil tested in Year 4 of the scheme.



Areas with basalt soils in NI.

Water Quality and Catchment Research

Nutrient enrichment of freshwaters by P is a primary cause of water quality impairment in NI, with agriculture a key source. In catchments with high rainfall, impermeable soils and steep slopes overland flow, or runoff, is the primary pathway by which nutrients and sediment are transferred to surface waters. High-resolution LiDAR digital elevation data provides the basis for modelling hydrological connectivity in the landscape, and identifying, in conjunction with soil permeability, those areas most prone to runoff and erosion. A programme of water quality monitoring in agricultural sub-catchments across each Zone will be used to develop and relate soil nutrient status and runoff risk potential to water quality and contribute to the development of strategies for achieving water quality improvements. (AFBI & Ulster University)

Stream monitored for water quality within SNHS

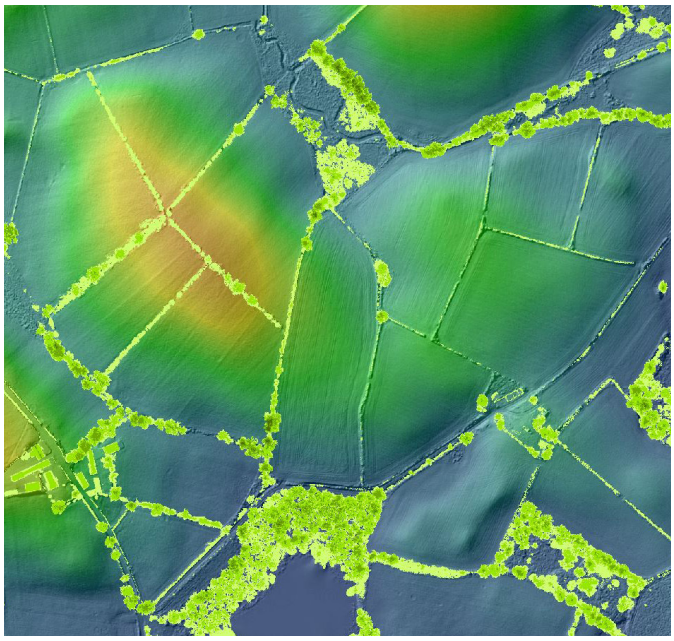
Runoff risk map showing high risk areas for nutrient and sediment loss

Carbon Research

A high-resolution LiDAR scan of Northern Ireland will provide a basis of modelling activities to estimate above ground biomass held in trees, woodlands and the 120,000 km of hedgerows in the region.

SNHS is also gathering information on rates of soil C sequestration in grassland fields on selected commercial farms and along undisturbed field boundaries on different soil types in Northern Ireland (involving radio-carbon dating and soil microbiological assessments). Ongoing research will investigate how fungal and bacterial communities are affected by management and elucidate mechanisms and processes governing changes in soil C storage in grassland and hedgerow soils.

Information arising from this research will be used to update the UK soil C inventory, and to identify management strategies which enhance C capture by soil and above ground biomass.



High-resolution LiDAR scan to estimate above ground biomass held in trees, woodlands and hedgerow

Behavioural Research

An assessment of the extent to which participation in the various components of the SNHS scheme has influenced farmer awareness, attitudes and behaviour is an important component in monitoring and evaluation of overall impact.

Research will apply a mixed-method approach using a questionnaire-based survey and qualitative semi-structured, in-depth interviews to explore farmers' awareness of the link between soil testing, improved productivity and water quality, and the role of experiential learning in adoption of best management practices for farm management.

Work will also examine how access to real-time water quality monitoring data from local rivers may serve to alter farmers' attitudes and behaviour toward water resources. (Leeds University, AFBI & Ulster University).

For more information:

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www.afbini.gov.uk/articles/soil-nutrient-health-scheme

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