SocEnv Soils and Stones project:
Case study demonstrating one or more of the ten principles of good soils and stones management

Arun to Adur 5 Year Soil Health Project

Earthworms in soil. Credit: Stephen Woodley (S.Woodley Crop Services).

Summary

A collaborative project on ten farms within the Arun to Adur (A2A) Farmer Cluster and delivered by S. Woodley Crop Services. The project involved detailed soil monitoring on 30 fields, covering 336 ha per year, with over 2,000 soil samples sent to NRM laboratories for analysis over the five-year project (2017 to 2022).

The Arun to Adur (A2A) Farmer's Group was established in 2015 with DEFRA funding. The group currently has 38 members farming a total of 10,896 hectares between the River Arun and River Adur in West Sussex, England. They have defined their own targets for implementation, which includes commitment to "*increase awareness of the soil as a valued living ecosystem with earthworms, effectively the most important form of livestock, to be monitored and nurtured*".

The Soil Health Project was developed to support this target. Promoting a better understanding of soils among cluster members, with the long-term aim of helping to deliver clean water for the community, improved farm wildlife and improved stocks of soil carbon to help mitigate climate change.

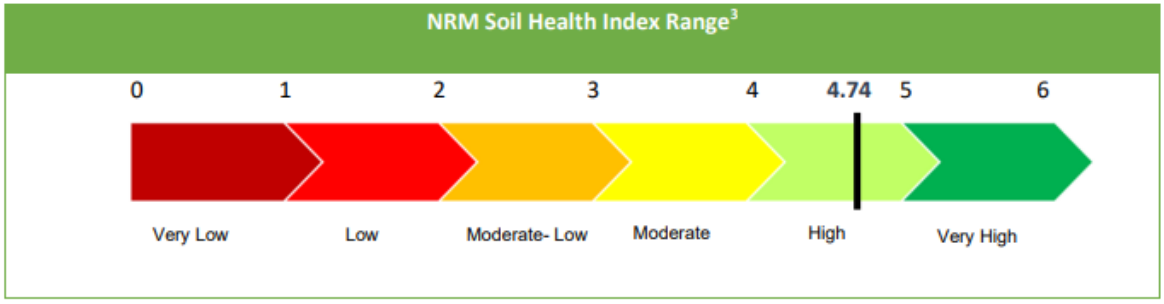
In summary, the project involved:

- Soil sampling every hectare of the project (16 cores per hectare GPS logged), repeated annually after harvest.
- Soil Mineral Nitrogen (SMN) sampling after harvest 0-30, 30-60 & 60-90cm (2017-2018) after harvest and before spring applications.
- Three earthworm spits per field per year (GPS logged for repeated counts annually).
- Soil Health Index analysis from NRM: P, K, Mg & pH; Organic Matter (LOI); Solvita Co2 burst (used to indicate bacteria activity) and Soil Texture Analysis.
- Gathering records on cropping, cultivation method, types of organic and inorganic fertiliser applications.
- Cranfield University statistical review.

The project has been a valuable exercise in partnership working and has created an extensive understanding of soil quality within the farmer cluster area. This baseline information provides a platform for a wide range of future applications such as benchmarking, sustainability reporting and carbon offsetting. The principal value of the project is nonetheless the way in which it has facilitated discussion amongst participants, helping them explore attributes of soil quality resulting from the various farm management actions and approaches on individual farms.

Southern Water would like to thank A2A and Stephen Woodley Crop Services for their participation in this valuable project.

Table 1: Average Soil Health index over 5 years



(NRM Soil Health Index Range)

Principle	How the principle was met in this project.
1. Implement soils and stones management practices to drive sustainable economic growth.	The project generated a valuable dataset for the A2A Farmer Cluster, enabling performance reporting, benchmarking, and improvement initiatives. This data could facilitate cluster-level reporting on carbon, water quality, and biodiversity improvements, potentially offering commercial advantages. Sharing best practices among members could enhance overall performance, serving as a valuable asset for public reporting, marketing, investment, or grant applications.
2. Preserve, protect, and enhance the value of all soils and stones in situ.	The A2A Soil Health Project has been a collaborative effort to increase awareness of the soil as a valued living ecosystem. It has been a way in which members of the cluster can investigate different components of soil health. Considering similarities and differences in aspects of soil quality, both within and between participating farms.
3. Promote and enhance the inherent value of soils and stones as part of a wider integrated environmental system (e.g., for carbon sequestration, food security and biodiversity).	The overall aim is to continue using the measurement of soil indices as a tool for productive farming, provisioning clean water, helping wildlife to thrive and sequestering carbon for climate change mitigation.
4. Use a common standard for soil health in relation to land-use, taking underlying soil conditions and	The study relied upon the NRM A500 Soil Health Suite. This suite comprises pH, available phosphorus, potassium, magnesium, organic matter [LOI], textural classification [Laser Diffraction] and Solvita

functions into account in the management of land.	CO_2 burst test. Soil health data is reported by NRM as a Soil Health Index (range 0 – very low, 1 – low, 2 – moderate-low, 3 – moderate, 4 or above- high). In this manner SHI is a composite measure adjusted for a range of soil characteristics.
5. Use common quality standards for soil based on principle #4 for excavated soils, stones and dredgings to be used in specific end-uses.	N/A
6. Understand and identify site specific soil conditions at the start of project planning or change of land-use. Define the status of any excavated soils and stones according to their value as an end-use resource and avoid the intention to discard them as surplus to the needs of the project. Protect undisturbed soils to enhance soil health.	N/A
7. Develop and implement a resource hierarchy for the management of land, soils and stones.	N/A
8. Implement financial metrics for the life cycle of all projects based on the impact on soil value in order to drive the market for offsetting (e.g., metrics for biodiversity loss, carbon sequestration and loss of food security).	N/A
9. Implement a national policy progressively to harmonise legislation, regulation, best practice guidance and monitoring programmes to protect soils. Include the fields of planning, land contamination, forestry, agriculture, ecological restoration, and waste management. Aim to promote integrated markets for soils and stones, offset trading and policies thereby allowing land values to reflect optimum soil health based on metrics in principle #4.	N/A

10. Periodically benchmark the natural and economic value of UK soils against both base-line UK and international metrics, taking into account global social, economic and environmental sustainability (e.g., the supply chain impacts of ensuring UK food security, and the valuation of soils and stones).	All metrics from the project will feed into national data for benchmarking purposes.

Credit: Stephen Woodley (S.Woodley Crop Services).

Lessons learned:

The overall conclusion to the project is that there is no single solution and many of the farms in the study have achieved high levels of soil health through a variety of different ways of working. The data is nonetheless useful in demonstrating the range of different management approaches, supporting ongoing dialogue within the cluster as they work collaboratively to improve farm productivity whilst maximising environmental outcomes.

Find out more:

www.arun2adur.co.uk