



# The science behind the schemes

Farmers and scientists can learn a lot from each other – but they don't typically socialise. Beth Brockett and Gareth Netto describe a recent event that definitely got the two groups talking.

The idea came about when Beth was talking to Will Rawling, Chair of the Cumbrian Farmer Network, about her planned research on the carbon and nitrogen content of the soil at Will's farm, Hollins. Will commented that he had been to several events on the importance of soil carbon storage, but nobody had ever told him about the science behind it.

So Beth did her best to explain, and in return Will shared some knowledge about how farmers make silage. They both got so much out of the conversation that they began to plan an event specifically to bring farmers and scientists together to talk about something they were both deeply interested in – soil.

Just a few months later Hollins hosted a group of more than 30 researchers, farmers and farming advisors, who gathered together on different parts of the farm to share their knowledge.

One group of researchers described their work on soil compaction in the Eden Valley, and how compaction and intense rainfall combined can lead to flooding. This is a familiar problem for many farmers in the area, and the group talked about things they could do differently to reduce the risk – such as reducing stock levels and farm traffic, or introducing species-rich pasture to improve soil structure.

The researchers were able to give farmers a better insight into the whole scientific process, explaining how carbon and nitrogen emissions are measured both in the field and in the lab (a length of drainpipe hammered into the ground being particularly helpful for the latter). Processes like photosynthesis and respiration occur above and below ground with soil microbes playing a huge role, and much of the discussion focused on the significance of nitrogen and carbon storage and leaching on things like soil quality, grassland productivity and resilience to drought.

They also talked about how plant traits, such as root length and leaf size, affect carbon and nitrogen retention underground, and how this links to the activities of soil microbes. Beth's own

research looks at the potential for using satellite images to analyse vegetation and estimate below-ground processes.

It turned out that fieldwork wasn't just the preserve of the scientists; one farmer described an experiment he is running on his dairy farm comparing how quickly silage fields and sheep pasture absorb water. Local farmers Duncan Ellwood and Sam Rawling talked about a monitoring scheme on nearby Kinnerside Common – a collaboration with Natural England – which aims to increase vegetation diversity on the common. Farmers are trained in plant identification and surveying – with the aid of a GPS, good eyes and a handbook – and paid for submitting information regularly.

'It is really important that farmers have a better understanding of how soils and everything that is stored in them work,' said host Will. 'Much of what was discussed at the meeting was actually about good farming practice, and if it helps to reduce damage to the planet then we all win.'

Farmers say it takes too long for scientific understanding to filter through to them, and many rely on advisors, who also feel they have limited access to useful information. Most believe that stronger bonds between farmers, advisors, scientists and policy-makers can only be a good thing – and this kind of event is definitely a step in the right direction.

## MORE INFORMATION

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