

Isle of Wight Catchment Sensitive Farming Winter 2019/20



Welcome

The Island's Catchment Sensitive Farming (CSF) project has recently been transferred to the Island's Area of Outstanding Natural Beauty (AONB) team with the full service to farmers continuing seamlessly. The new project officer is Mark Simmons who took up his post in July 2019. Some farmers may remember Mark rolling out the original Countryside Stewardship agreements under the Countryside Commission.

Our thanks go to Lucy Temple, the previous CSF officer, who helped farmers across the Island with practical advice on environmentally friendly farming practices. Lucy understood Island farming, the challenges of livestock enterprises, issues of soil conservation and the burden of paperwork and regulation faced by all.

Lucy is now in post as the AONB's Environmental Records Officer, so we are all fortunate that her contribution to Island life remains and we continue to benefit from her sound approach to land management.

The AONB's base with CSF is now located at Branstone Farm. This site previously served as the Council's agricultural education centre and it is fitting that Branstone remains a focus of land management and farming on the Island.

Soil Health and Regeneration Event



This year's wet autumn brought home the issue of soil management with many facing the difficulty of seed-bed preparation for autumn sown crops in fields saturated by frequent downpours. Harvesting maize was made difficult and those on light ground risked losing valuable top soil by erosion from steep slopes. It was therefore good timing for the **East Yar Farm Cluster Group** to host a talk '**Soil Health and Regeneration**' by Stephen Briggs. The event included some practical demonstrations on how soil, protected by a green cover, can resist erosion whereas bare soil under wet conditions allows silt-laden run-off. Losing top soil and

silt can clog drains, spill onto roads and damage the wildlife in rivers. The talk was held at Marvel Farm, where farmers were shown how cultivated fields, including those under maize, are protected by a diverse green cover. After late-season harvesting, damage by winter rains is minimised, the soil gains carbon and any loss of Nitrogen is reduced.

Stephen's talk provided valuable information on how to improve soil health and therefore farm productivity. The first question posed was 'Why is soil health important?'. Crop nutrition is the obvious answer but that shouldn't overlook water management, soil workability/land use and the avoidance of erosion and pollution.

Soil health is impacted by cultivations, cropping, inputs and compaction but Stephen's first topic was soil organic matter which is generally very low – and declining - in arable soils. How many farms are 'emptying their soil carbon account?'

Whilst the chemical composition of soils is often the focus, healthy soils must also have the correct physical and biological components. So, what are the benefits of raising soil organic matter? The answer is, more soil organic matter = greater yield!

Table 1. The benefits of increasing organic matter

Physical	Chemical	Biological
Better infiltration	Improved soils' CEC*	Increased microbial activity
Soil aeration	Buffer against Ph change	Food resources for soil microbes
Aggregate stability	Accelerated decomposition - more nutrient availability	Enhanced soil microbial diversity
Improved water holding capacity		
Reduced surface crusting/capping		

*Note,

- Cation exchange capacity (CEC) is the total capacity of a soil to hold exchangeable cations.
- CEC is an inherent soil characteristic and is difficult to alter significantly.
- It influences the soil's ability to hold onto essential nutrients and provides a buffer against soil acidification.
- Soils with a higher clay fraction tend to have a higher CEC.
- Organic matter has a very high CEC.
- Sandy soils rely heavily on the high CEC of organic matter for the retention of nutrients in the topsoil.

Sandy soils (applicable to many parts of the Island) will typically have low organic matter and therefore low CEC so nutrients tend to be lost during rainfall (autumn 2019!). The negatively charged particles of organic matter attract positively charged nutrients e.g. Ca, Mg, K, Na, holding them in the soil until they are taken up by plants.

But what is the importance of soil biology? Healthy soils will contain fungi, bacteria, protozoa, springtails, nematodes (which consume bacteria, plants, and fungi), mites, earthworms, ground beetles, millipedes,

centipedes, ants and spiders. Since 85% of crop nutrient availability is affected in some form by soil biology these organisms are vital to maintain yields.

Stephen highlighted the role of Mycorrhizas – the fungal associations between plant roots and beneficial fungi. Mycorrhizal fungi's thread-like hyphae increase active root surface by up to 700 times. Then there is the role of glomalin, a sticky substance secreted by the thread-like fungal hyphae, that funnels nutrients and water to plant roots. Glomalin acts like little blobs of chewing gum on strings or strands of plant roots and the fungal hyphae. Into this sticky "string bag" fall the sand, silt and clay particles that make up soil, along with plant debris and other carbon-containing organic matter. Sand, silt and clay stick to the glomalin, starting aggregate formation, a major step in soil creation.

On the surface of soil aggregates, glomalin forms a lattice-like waxy coating to keep water from flowing rapidly into the aggregate and washing everything away, including the carbon. As the builder of the formation "bag" for soil, glomalin is vital globally to soil building, productivity and sustainability, as well as to carbon storage.

Unfortunately (and unsurprisingly!), some insecticides and fungicides alter microbial activity; the latter can inhibit mycorrhizae as can some herbicides. Imidacloprid for example remains in soil after 3 weeks, reduces earthworm burrowing activity, is toxic to nematodes, halves abundance of springtails in grassland, affects growth and function of woodlice, slows down growth and activity of compost worms and microbial decomposition. All farmers will of course therefore use any pesticide sparingly and be aware of their impact upon soil health.



Demonstration - Healthy soils with much organic matter and green cover prevent the loss of top soil

Stephen's concluding comments...

- Soil health is complex – but vital for productivity & for Agric. policy
- Soil biology is important for a healthy soil
- Right physical /chemical balance & feed biology with SOM
- We are all livestock farmers
- Consider cropping (incl cover crops), cultivations & inputs
- Measure & monitor

and when soil testing...

- Soil testing can help you monitor how your management practices are impacting soil health
- Testing the health of your soil means more than testing the nutrient status of your soils (the standard M, P, K, pH test)
- Think about where, how, & when you sample – be consistent
- Use the results to inform future management decisions

For biological soil test see <http://www.soilbiolab.co.uk/>

Catchment Sensitive Farming

For a free advisory farm visit contact:

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CATCHMENT SENSITIVE FARMING



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