

Soil Health Indicators for Sustainable Livestock Production

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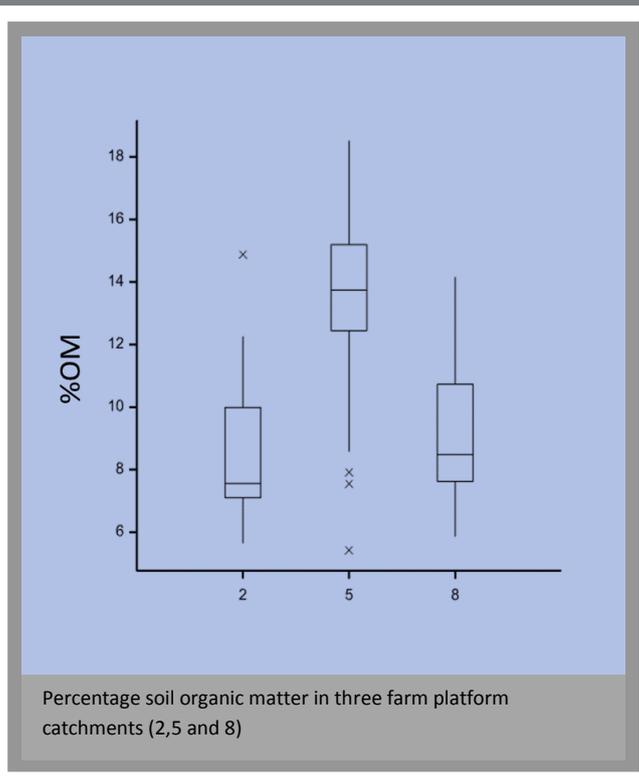
Soil health is very important, soil not only supports the plants we grow for food but also regulates nutrient losses, greenhouse gas emissions, water quality and river flow. Healthy soil is essential for a sustainable farming system, but across much of the world, farming practices are leading to soil degradation resulting in environmental damage and reductions in productivity.

I am working on a BBSRC -Newton Fund project to determine the effect of different grass varieties on soil health and develop new ways to quickly and effectively assess soil health in the tropics. My work on the farm platform is providing vital information to inform measurements and understand the results I am getting from small scale field trials looking at different tropical grasses in Colombia

I have been developing techniques for measuring soil health. One measure I am particularly interested in is aggregate stability as reduced aggregate stability can increase erosion and soil loss to rivers. I have been using the unique farm platform resources to assess how differences in aggregate stability under the different managements affect soil loss at the landscape scale. With the help of the farm platform data team I have established a 50 m² grid over four of the farm platform fields and selected two random points to sample from each of the squares. The samples are now being processed for aggregate stability, friability (resistance to fracture under pressure) and organic matter concentration. I will also look for differences in the concentration of soluble organic matter in the different fields. Using the farm platform data portal, I will compare my findings to the data on sediment and soluble organic carbon content at the flumes in each field to determine how the changes I see at the plot scale might scale up over the whole landscape.



Soil aggregates after wet sieving in simply constructed sieve in



Percentage soil organic matter in three farm platform catchments (2,5 and 8)

So far the results from soils collected in 2015 have shown clear differences in the organic matter concentration and the aggregate stability between three catchments (2,5, and 8) with catchment 5 (permanent pasture) having the greatest soil organic matter and catchment 2 (high sugar grass) the. Catchment 5 also had the most stable aggregates, catchment 8 (legume and grass mix) also had relatively stable aggregates whilst catchment two had significantly less stable aggregates.

Analysis of aggregate stability will be repeated on samples collected in 2016 alongside for analysis of the composition of the organic matter including soluble organic matter concentration to identify the reason for contrasting aggregate stability. Data from the farm platform flumes will be analysed for Autumn and winter 2016 will enable the effect of aggregate stability and soluble organic carbon content on sediment loss and dissolved organic carbon content to be determined.