UC Merced Environmental Systems Seminar (ES 291)

Wednesday 7th December 2016

12.30-2.00 PM COB 105

Soil Organic Carbon: The Little Things Mean a Lot

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Increasing organic carbon storage in degraded agricultural soils is one of the only tools at our disposal for the large-scale, medium-term mitigation of climate change which, if actively implemented, could provide a valuable temporal buffer whilst technological solutions are sought to provide carbon-neutral energy. Improved soil fertility for food production, as well as a range of other ecosystem services, generally goes hand-in-hand with increased soil organic carbon. Soil resilience, or the ability of soils to recover from shocks (such as the extreme weather events linked to climate change), is also improved in organic-rich mineral soils. All of these aspects are essential for the sustainable intensification of agriculture to provide sufficient, nutritious food for the rapidly increasing global human population, now and in the future. So, when the multiple benefits of increasing soil organic carbon are so clear, why is it so rarely overtly managed in farming systems? Part of the answer is the difficulty in measuring a small change in the huge soil carbon pool in a way that is meaningful. I will describe my research journey from the mystery and magic of manures, and debunking myths about chemical recalcitrance, to the development of common sense metrics with farmers to measure change and to reap the benefits of soil organic carbon management.