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# Biochar: Promoting citizen driven carbon capture economies by developing science-inspired products that create a pull in the biochar market.

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Prevention of catastrophic climate change requires push-pull mechanisms to attain critical mass engagement in reducing global carbon emissions or through large scale carbon capture, which is currently administered through international carbon trading schemes. Unfortunately the formal carbon trading market appears to be in disarray, as there is crisis of trust in the system; as a result the carbon credit prices are low and investment in solutions has almost ground to a halt. However there is still a public and commercial demand for trustworthy carbon credit products; consequently a vibrant and growing market.
With this in mind we wanted to develop high value carbon-based substitution products for glass house production that that could have significant peripheral benefits to create market pull mechanisms.
We systematically tested a variety biochar based products in hydroponic growing systems and commercial nursery scenarios, to determine their potential as substitute products.
Results suggested that the high pH of the raw-biochar produced rendered it unsuitable for hydroponic production. Blending and buffering of the biochar for plant production was investigated and showed greater promise with comparable production potential.
In another arm of horticultural production millions of cubic metres of peat are used across Europe each year. Biochar has a number of comparable properties to peat, it holds water, forms air pockets or pores to provide oxygen to plant roots and allows for drainage, it is light and most importantly it is sterile. In combination with other horticultural media such as compost, biochar blends could be a viable alternative to peat. Although there has been an explosion of research into the effect of biochar as a soil amendment, most of these publications deal with the impact of biochar on the carbon sequestration capacity of soils however few address the peripheral benefits of biochar on soil water holding capacity specifically in a horticultural context. Our research has shown that that biochar has a positive impact on the water holding capacity of soils in agronomic settings. We investigated whether biochar addition to potting composts could improve plant water status and plant resilience in greenhouse scenarios using conventional methods and state of the art stable isotope tools.
The results and conclusions from these experiments will be presented.
Given current interest in carbon capture and circular economies biochar could play a multifaceted role in meeting the food-demands of future urban farming- systems.