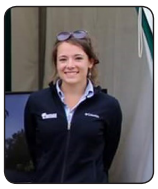
Oil & Gas Research

Abstract



Biochar as a soil amendment to improve tree survival and health in the urban environment

Emma Schaffert [1 2], Glynn Percival [3]

[1]*Agriculture, Food & Policy Development Department, University of Reading, UK.*
[2]*The F.A Bartlett Tree Experts Company, Charlotte NC, USA.*
[3]*The R.A. Bartlett Tree Research Laboratory, Reading, UK.*

Abstract:

Biochar has been suggested for use as a soil amendment as a means to sequester carbon, as well as increasing plant productivity by improving water holding capacity and nutrient retention of the soil. This study aims to determine if biochar is a viable soil amendment for trees planted into an urban landscape to increase planting survival rates and tolerance to abiotic stressors (e.g. salinity, drought, compaction), whilst attempting to define which physiological/biochemical responses induced by biochar produce these results. The significance of biochar feedstock and production conditions in providing these improvements will also be discussed. The benefits of trees in urban landscapes are well recognized, including improvements in human mental and physical health, environmental conditions and ecological value. However tree losses in the urban setting are common, partially attributed to an unbalanced root:shoot ratio from the physical loss of root material during the planting process. Field studies so far have evaluated the effect of biochar soil amendments on leaf photosynthetic efficiency, root growth, soil water relations, and nutrient retention. Biochar derived from hardwood biomass and hardwood/softwood blends have yielded optimal results improving the health of street planted trees in a London borough. Most biochars evaluated had a positive effect on root proliferation (5% and 52% increase) dependant on biochar feedstock.

Biography:

Emma Schaffert is currently studying for her PhD at the University of Reading, UK into the use of biochar to enhance stress tolerance of urban trees. She is also a Research Technician at the Bartlett Tree Research Laboratory. She has authored several papers and technical articles in the areas of biochar, pest and disease protection, and soil science.

Recent Publications:

1: Aldhous, J.R., and W.L. Mason. 1994. Forest nursery practice. Forestry Commission Bulletin No 111. HMSO, London, UK. Blackwell, P., G. Riethmuller, and M. Collins. 2009. Biochar applications in soil. pp. 207–226. In: J. Lehmann and S. Joseph (Eds.).

2: Biochar for Environmental Management: Science and Technology. Earthscan, London, UK.

3: Blunden, G., and D.L. Woods. 1969. Effect of carbohydrates in seaweed fertilizers. Proceedings of the 6th International Seaweed Symposium. pp. 647–653.

4: Bondada, B.R., and J.P. Syvertsen. 2003. Leaf chlorophyll, net gas exchange, and chloroplast ultrastructure in citrus leaves of different nitrogen status. Tree Physiology 23:553–559.

5: Chandler, J.W., and E. Dale. 1994. Nitrogen deficiency and fertilization effects on needle growth and photosynthesis in Sitka spruce (Picea sitchensis). Tree Physiology 15:813–817.

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